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THE  
JOURNAL  
OF THE  
ROYAL GEOGRAPHICAL SOCIETY.

VOLUME THE FORTY-EIGHTH.

25255



910.5  
J.R.G.S.

1878.

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# Royal Geographical Society,

1878.

## REPORT OF THE COUNCIL,

READ AT THE ANNIVERSARY MEETING ON THE 27TH MAY.

THE COUNCIL have the pleasure of submitting to the Fellows the ordinary Annual Report on the financial and general condition of the Society:—

*Members.*—The number of Fellows elected during the year ending April 30th was 187, besides three Honorary Corresponding Members. In the previous year (1876-7) the number of new Fellows was 292; in 1875-6, 266; and in 1874-5, 294. On the other hand, there have been removed by death 74, by resignation 44, and by default of subscription 20, making the net increase 49. In the year 1876-7 the net increase was 138; in 1875-6, 149; and in 1874-5, 202. The Society has also lost by death one Honorary Member and two Honorary Corresponding Members. The total number of Fellows (exclusive of Honorary) on the list on the 30th of April was 3334, of whom 762 were Life Members.

*Finance.*—The total net income of the Society for the Financial year ending 31st of December, 1877 (exclusive of balance in hand), was 7950*l.* 1*s.* 11*d.*, of which 6099*l.* consisted of the entrance fees and subscriptions of Fellows. In the previous year (1876) these amounts were 8611*l.* 11*s.* 8*d.* and 7109*l.* 11*s.* respectively, and in 1875, 7934*l.* 15*s.* 10*d.* and 6441*l.* 11*s.* The amount just stated as the income for 1877 includes a donation of 500*l.* from Mr. C. J. Lambert, given in carrying out the provisions of his father's will, the late Mr. Charles Lambert, a Fellow of the Society.

The net expenditure, as will be seen by the annexed Balance-sheet, was 8940*l.* 17*s.* 11*d.*; but this includes the Special Parliamentary Grant of 3000*l.* transferred to the Cameron Expedition Fund in February 1877. In the two previous years the expenditure was 6870*l.* 13*s.* 1*d.* and 5683*l.* 4*s.* 10*d.* The sum of 2538*l.* 2*s.* was invested during the year.



## Receipts.

## BALANCE-SHEET

1877.	£. s. d.	£. s. d.
Balance in Bankers' hands 31st Dec. 1876) (deducting Cheque not presented) .. .. .}	5756 17 11	
Ditto Accountant's Ditto .... .}	29 4 2	5,786 2 1
<i>Subscriptions:—</i>		
For the current year .. .. .	3715 0 0	
Paid in Advance .. .. .	510 0 0	
Arrears .. .. .	536 0 0	4,761 0 0
<i>Entrance Fees</i> .. .. .	.. ..	588 0 0
<i>Life Compositions</i> .. .. .	.. ..	750 0 0
<i>Subscriptions paid in error</i> .. .. .	.. ..	64 0 0
<i>Donation by Mr. C. J. Lambert in carrying out</i> <i>the provisions of his Father's will</i> .. .. .}	.. ..	500 0 0
<i>Parliamentary Grant</i> .. .. .	.. ..	500 0 0
<i>Royal Premium</i> .. .. .	.. ..	52 10 0
<i>Rent of Shop and Cellars</i> .. .. .	.. ..	70 0 0
<i>Publications, Sale of, and Advertisements</i> .. ..	.. ..	170 4 7
<i>Loan of Diagrams</i> .. .. .	.. ..	2 2 0
<i>Dividends:—</i>		
North-Eastern Railway 4 per Cent. Debenture) Stock .. .. . 1000L.}	39 10 0	
India 5 per Cent. Stock .. .. . 1000L.	49 7 6	
Great Indian Peninsula Railway 5 per Cent.) Stock .. .. . 4000L.}	209 7 0	
Great Western Railway 4½ per Cent.) Debenture Stock .. .. . 1800L.}	75 10 10	
London and North-Western Railway 4 per) Cent. Debenture Stock .. .. . 1000L.}	39 10 0	
Exchequer Bills .. .. . 1000L.	19 15 0	
Caledonian Railway 4 per Cent. Preference) Stock, No. 1 .. .. . 2000L.}	59 5 0	
		492 5 4
		£13,736 4 0

REGINALD T. COCKS,  
Treasurer.

## FOR THE YEAR 1877.

*Expenditure.*

1877.	£.	s.	d.	£.	s.	d.
<i>House</i> :—Taxes and Insurances, Repairs, Improvements and Furniture, Coal, Gas and Water-rates, &c. . . . .	..	..		368	2	3
<i>Office</i> :—Salaries and Gratuities, Stationery and Printing, Postages and Parcels, &c. . . . .	..	..		1,744	11	2
<i>Library</i> :—Salaries, Books, &c. . . . .	..	..		385	9	11
<i>Map-Room</i> :—Salaries and Gratuities, Maps, &c. . . . .	..	..		573	12	9
<i>Meetings</i> .. . . .	..	..		180	13	8
<i>Lecturers' Fees</i> .. . . .	..	..		150	0	0
<i>Medals</i> and other awards .. . . .	..	..		145	11	0
<i>Publications</i> :—Printing Journal and Proceedings, Maps and Illustrations, &c. . . . .	..	..		1,741	12	10
<i>Payments</i> in error returned .. . . .	..	..		77	0	0
<i>Expenditures</i> :—						
Amount contributed to Cameron Expedition Fund (including Special Parliamentary Grant of 3000 <i>l.</i> ) .. . . .	3048	9	4			
Donation to the African Exploration Fund .. . . .	500	0	0			
				3,548	9	4
<i>Subscription</i> to the Jane Park Annuity Fund .. . . .	..	..		10	10	0
"    "    Pocock Testimonial Fund .. . . .	..	..		5	5	0
"    "    Von Siebold Monument .. . . .	..	..		10	0	0
<i>Investments</i> :—Purchase of 2000 <i>l.</i> Caledonian Railway 4 per Cent. Preference Stock, No. 1 } .. . . .	..	..		2,038	2	0
(Purchase of 526 <i>l.</i> 6 <i>s.</i> 4 <i>d.</i> Consols (Lambert Donation) .. . . .	..	..		500	0	0
<i>Balance</i> in Bankers' hands 31st Dec. 1877 (excluding draft not presented) .. . . .	2240	17	0			
Do. Accountant's Do. .. . . .	16	7	1			
				2,257	4	1
				£13,736	4	0

Audited and found correct, the 10th day of April, 1878.

COTTESLOE,  
 RAWSON W. RAWSON,  
 CHAS. NICHOLSON,  
 S. P. LOW,

Auditors.

The Finance Committee of the Council have, as in former years, held their meetings regularly, supervising the accounts of the Society. The Annual Audit was held on April 10th, the Auditors, whose signatures are appended to the annexed balance-sheet, being the Right Hon. Lord Cottesloe and Sir Rawson W. Rawson, on behalf of the Council; and Sir Charles Nicholson, Bart., and Mr. S. P. Low, on behalf of the Fellows. The thanks of the Council and of the Society at large are due to these gentlemen for having freely devoted their time to this arduous task.

STATEMENT showing the RECEIPTS and EXPENDITURE of the Society from the Year 1848 to the 31st Dec. 1877.

	Year.	Cash Receipts within the Year.			Cash Amounts Invested in Funds.			Deducting Amounts Invested in Funds; actual Expenditure.		
		£.	s.	d.	£.	s.	d.	£.	s.	d.
In 1856 a Treasury Grant of 1000 <i>l.</i> for the East African Expedition received.	1848	696	10	5	..	..		755	6	1
	1849	778	3	0	..	..		1098	7	6
	1850	1036	10	5	..	..		877	2	10
In 1860 a Treasury Grant of 2500 <i>l.</i> for the East African Expedition received.	1851	1056	11	8	..	..		906	14	7
	1852	1220	3	4	..	..		995	13	1
	1853	1917	2	6	..	..		1675	6	0
	1854	2565	7	8	..	..		2197	19	3
In 1869 Legacy of Mr. Benjamin Oliveira, 1506 <i>l.</i> 17 <i>s.</i> 1 <i>d.</i>	1855	2584	7	0	..	..		2636	3	1
	1856	3372	5	1	533	10	0	2814	8	1
	1857	3142	13	4	378	0	0	3480	19	9
In 1870 Legacy of Mr. Alfred Davis, 1800 <i>l.</i>	1858	3089	15	1	..	..		2944	13	6
	1859	3471	11	8	950	0	0	3423	3	9
In 1871 Legacy of Sir Roderick Murchison, 1000 <i>l.</i>	1860	6449	12	1	466	17	6	5406	3	7
	1861	4792	12	9	1358	2	6	3074	7	4
	1862	4659	7	9	1389	7	6	3095	19	4
In 1872 Amount of Mr. James Young's Grant for the Livingstone Congo Expedition, 2000 <i>l.</i>	1863	5256	9	3	1837	10	0	3655	4	0
	1864	4977	8	6	1796	5	0	3647	7	10
	1865	4905	8	3	1041	5	0	4307	4	5
	1866	5085	8	3	1028	15	0	4052	15	0
In 1874 Amount of Mr. James Young's Grant for the Livingstone Congo Expedition, 1041 <i>l.</i> 14 <i>s.</i>	1867	5462	7	11	1029	0	6	3943	17	4
	1868	5991	4	0	1857	3	9	4156	17	10
	1869	6859	16	0	2131	5	0	4646	0	8
	1870	8042	6	1	3802	6	0	3845	10	6
	1871	6637	3	7	1000	0	0	3726	4	4
In 1876 Special Parliamentary Grant of 3000 <i>l.</i> towards the Expenses of the Cameron Expedition.	1872	8119	7	9	1999	4	6	5871	13	2
	1873	7761	18	10	2015	1	8	6697	12	6
	1874	8753	5	10	499	0	0	7876	2	3
	1875	7934	15	10	2002	7	6	5683	4	10
In 1877 Donation of 500 <i>l.</i> by Mr. C. S. Lambert in carrying out the provisions of his father's will.	1876	11,611	11	8	..	..		6870	13	1
	1877	7950	1	11	2538	2	0	8940	17	11*

\* This sum includes the Special Parliamentary Grant transferred to the Cameron Expedition Fund in February, 1877.



## STATEMENT OF ASSETS—31st December, 1877.

	£	s.	d.
Freehold House, Fittings, and Furniture, estimated (exclusive of Map Collections and Library in- sured for 10,000 <i>l.</i> ) .. .. .	20,000	0	0
Investments, viz. :—			
India 5 per Cent. Stock .. .. .	£1000	0	0
Great Western Railway 4½ per Cent. Debenture Stock (Davis Bequest) .. .. .	1800	0	0
London and North-Western Railway 4 per Cent. Debenture Stock (Murchison Bequest) .. .. .	1000	0	0
North-Eastern Railway 4 per Cent. Debenture Stock .. .. .	1000	0	0
Great Indian Peninsula Railway Guaranteed 5 per Cent. Capital Stock .. .. .	4000	0	0
March Exchequer Bills .. .. .	1000	0	0
Caledonian Railway 4 per Cent. Preference Stock No. 1 .. .. .	2000	0	0
Consols (Lambert Donation) .. .. .	526	6	4
		12,326	6 4
Arrears due on December 31, 1803 <i>l.</i> , estimated at .. .. .		651	10 0
Balance at Bank .. .. .	2240	17	0
„ in Accountant's hands .. .. .	16	7	1
		2,257	4 1
Total	£35,235	0	5

*Publications.*—The 47th volume of the 'Journal' is now ready for issue to the Fellows. Three numbers of Volume 22 of the 'Proceedings' have been published during the present Session, and a fourth is in the press. Volume 21 was completed in the summer of 1877. A new Edition of the 'Hints to Travellers,' edited and thoroughly revised by Mr. Francis Galton, has also been prepared during the Session and is now ready for publication.

*Expeditions.*—With the exception of outstanding liabilities on account of the Cameron Expedition to the amount of 48*l.* 9*s.* 4*d.*, no money has been spent on Expeditions during the year. A grant of 500*l.* has been made to the Fund administered by the African Exploration Committee.

*Annual Grant for Scientific Purposes.*—The Committee entrusted by the Council with the administration of their annual grant of 500*l.* for scientific purposes, selected the following gentlemen to deliver the three science lectures for the Session 1877–8 :—Professor P. M. Duncan, M.D., F.R.S., President of the Geological Society, subject, 'The Formation of the Main Masses of the Land,' Captain F. J. Evans, C.B., F.R.S., Hydrographer

to the Admiralty, subject, 'The Magnetism of the Earth;' and Mr. W. T. Thistleton Dyer, Assistant-Director, Royal Gardens, Kew, subject, 'Plant Distribution as a Field for Geographical Research.' Since the last Anniversary the first two of these lectures have been delivered, and also the third of the previous Session, viz., on the 25th of June, 1877, by Mr. A. R. Wallace, on 'The Comparative Antiquity of Continents, as indicated by the Distribution of Living and Extinct Animals.'

The Committee have also taken into frequent consideration the practicability of preparing a MS. Map on a large scale of Equatorial Africa, in which the routes of travellers shall be represented in much more detail than hitherto, and which shall be accompanied by a Memoir, to contain a list of authorities and references, and such further information as cannot be included in the Map. The preparation of a trial sheet of the section, 5 degrees of latitude and of longitude in height and width, in which Kilimanjaro is situated, has been entrusted to Mr. Ravenstein, and is nearly completed.

*Library.*—610 books and pamphlets have been added to the Library during the past year; 503 (including all the pamphlets) being donations, and 107 purchased. Besides these, and without reckoning such publications of general interest as the 'Athenæum,' 'Academy,' 'Nature,' &c., 1058 separate parts or numbers of periodicals, 'Transactions,' Reports, &c., have been received, including those obtained by gift in or towards completion of defective series.

170 pamphlets and small works have been put into covers on the Society's premises, and 354 volumes have been bound, during the past year.

The sum of 111*l.* 8*s.* 7*d.* has been expended by the Library Committee in purchasing books, and the further sum of 84*l.* 10*s.* in binding.

Among the more important accessions are:—The volumes required to complete the Society's copy of the original folio Spanish edition of Ramon de la Sagra's 'Historia de la Isla de Cuba' (the whole presented by J. P. Gassiot, Esq.); The General Reports of the Revenue and Topographical Survey Operations in India, Price's Gazetteer of Mysore and Coorg, and vols. vi. to xx., inclusively, of Hunter's Statistical Account



of Bengal, with very many other less voluminous but equally valuable works (presented by her Majesty's Secretary of State for India); Leitner's Languages and Races of Dardistan, 2nd edition (presented by the Secretary of the Punjab Government); Klaproth's *Tableaux historiques de l'Asie*, with Atlas (presented by Sir Walter C. Trevelyan, Bart.); *Anales del Ministerio de Fomento de la República Mexicana*, vols. i. and ii., *Boletín*, vols. i. and ii., Reports by the *Ministro de Fomento* for 1711, 1865, 1868-69, and 1873, and other Reports, &c., by Almaraz, García y Cubas, Orozco y Berra, Bárcena, Sartorius, and Jiménez (presented by the Mexican *Ministro de Fomento*); Baron Richthofen's *China*, vol. i. (presented by the Author); vols. vi. and vii. of the *Encyclopædia Britannica*, 9th edition (presented by Messrs. A. and C. Black); the English versions of the *Voyages of Olearius and Tavernier* (presented by Major E. Wilkinson); Sir C. W. Thomson's '*Voyage of the Challenger*'; Danckwerth and Meyer's '*Neue Landesbeschreibung der zwey Hertzogthümer Schleswich und Holstein*,' 1652 (presented by Dr. Forchhammer); Lefroy's *Memorials of the Bermudas* (presented by the Author, per Messrs. Longman); Boxhorn's *Theatrum Hollandiæ*, 1632; Antoninus, *Vetera Romanorum Itineraria*; Fritsch's *Eingeborenen Süd-Afrika's*; Dr. Bessells' *Observations and Hall's Narrative of the Polaris Voyage* (presented by Dr. Bessells and Admiral Rodgers); the Reports and other scientific publications of the *Surveys of Hayden, Wheeler, Powell, and King* (presented by the Chief Officers of the *Surveys*); *Hayden's Sun Pictures of Rocky Mountain Scenery* (presented by Prof. F. V. Hayden); Various publications of the *Egyptian General Staff* (presented by General Stone); the continuation of the *Memoirs and other publications of the Geological Survey of India* (presented by the Indian Government, per Dr. Oldham); the continuation of *Reclus's Géographie universelle*, vol. iii. (presented by the Author); Two Albums of photographs of *Blue Mountain Scenery, New South Wales* (presented by Eccleston du Faur, Esq.); *New Zealand*, by C. D. Barraud and W. T. L. Travers (presented by C. D. Barraud, Esq.); Album containing photographs of types of nations of *Central Asia* (presented by General Kaufmann); and *Album der Deutschen Gesellschaft zur Erforschung Aequatorial-Afrikas, Landschaftlicher Theil und Anthropologischer Theil*.



The transcripts of Titles for the second Supplemental Catalogue are now completed, and their arrangement and examination is in hand.

The Library continues to be much consulted by Fellows of the Society and officers of public departments. Reference is also constantly being made to it by students, authors, and artists connected with publishing establishments.

*Map-Room.*—The Council have under consideration the revision of the present classified Register of Maps, and (with a view to its being subsequently printed) the preparation of an alphabetical catalogue of all the Maps in the Society's collection, with an index of authors.

The large Maps of the Society have been lent on several occasions during the past year for the purpose of illustrating geographical lectures in different parts of the kingdom, and the Fellows of the Society, public officers, students, and the general public have made frequent use of the Society's collection of Maps and Charts, particular interest having been shown in the series of Maps now exhibited on screens in the Map-Room.

The accessions to the Map-Room Collection since last Anniversary comprise 451 Maps on 2092 Sheets; 5 Atlases containing 226 Sheets; and 131 Photographs and Engravings. Of these, 70 Maps, 3 Atlases, and 22 Engravings, have been purchased. 4 new Diagrams (Transvaal, Central Africa, New Mexico, Province of Sze-Chuen) have been constructed on the establishment; and 3 others (Routes between Zanzibar and Unyanyembe, Caucasus and Armenia, and Lake Nyassa to Ugogo) corrected and extended; besides corrections and additions to the general Diagrams. The accessions of the present year are in excess of those of last by 60 Maps on 672 Sheets; 153 Sheets of Atlases; and 131 Photographs and Engravings. There are in course of preparation two large Diagram-maps, one of Asia and a smaller one of Africa.

Among the most important additions to the Map-Room are:—1277 Sheets of the Ordnance Survey of the British Isles on various scales (presented by the First Commissioner of Works, through Major-General Cameron, Director). 99 Charts of the British Admiralty, and an Atlas of Index Charts (presented by the Lords Commissioners of the Admiralty, through

Captain F. J. Evans, C.B., Hydrographer). 59 Sheets French Admiralty Charts (presented by the *Dépôt des Cartes et Plans de la Marine*). 17 Sheets of United States Charts (presented by Commodore R. H. Wyman, U.S.N., Hydrographer to the Bureau of Navigation, Washington). 7 Sheets Indian Marine Survey (presented by the India Marine Survey Department, through Commander J. Dundas Taylor, late I.N.). 247 Sheets of the various Indian Government Surveys (presented by H.M. Secretary of State for India, through the India Office). 45 Sheets of Maps (presented by the Quartermaster-General's Department, through Colonel R. Home, R.E., C.B.). 24 Sheets of the *Topographisch Atlas der Schweiz* (presented by the Chief of the Federal Survey, Berne). 13 Sheets of the *Topographical Atlas of Denmark* (presented by H. E. the Danish Minister). 7 Sheets of the Geological Survey of Sweden (presented by Otto Torell, Director). 4 Maps issued by General Stone, Chief of the General Staff, Cairo; prepared by the officers of the Khedive's Expedition to the Upper Nile, Darfur, and Abyssinia). 18 Maps (presented by Dr. A. Petermann). Keith Johnston's *Royal Atlas of Modern Geography, 1878* (presented by W. and A. K. Johnston). 10 Maps (presented by E. Stanford, Esq.). *Special-Karte des Türkischen-Armeniens. Die Gruppierung der Confessionen in Bosnien und der Hertzgowina* (presented by H. Kiepert). *Special-Karte der Oesterreichisch-Ungarischen Monarchie*, 41 sheets (purchased). Map of New Zealand, showing Roads, Railways, and County boundaries (presented by James Harvey, Esq.). *Carta Geográfica-Topográfica de la Isla de Cuba* (presented by Lord John Hay). Language Maps of India and the Border lands, and of Further India and the Indian Archipelago by R. N. Cust, Esq. (presented by the Author). 3 parts of Spruner's *Atlas of Medieval Geography* (presented by Justus Perthes). Map of Lake Albert, Provinces of the Equator, by Colonel Mason Bey (presented by General Stone). 107 Photographs taken during the Arctic Expedition of 1875-76 (presented by the Secretary of the Admiralty). South Australia as divided into Counties and Hundreds; compiled in the Surveyor General's Office, Adelaide, 18 sheets (presented by the South Australian Government through the Agent-General). *Mondcharte, von Wilhelm Gotthelf Lohrmann* (purchased).



*Instruments supplied to Travellers.*—During the past year a set of instruments consisting of 1 prismatic compass, 1 tripod stand, 1 boiling apparatus (Alpine pattern), 3 B. P. thermometers, 2 aneroids, 1 maximum and 1 minimum thermometer, 1 wet and 1 dry bulb thermometer, value 27*l.*; have been lent to the Rev. F. W. Holland, for his explorations in the peninsula of Sinai.

All the Society's instruments have been put in a thorough state of repair, and the instruments lent to Mr. J. A. Skertchly (West Africa), and Mr. H. B. Cotterill (Lake Nyassa), have been returned.



# ROYAL GEOGRAPHICAL SOCIETY.

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## Vice-Patron.

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&c., &c.

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(ELECTED 26TH MAY, 1879.)

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1879.

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Francesco di Paola, No. 11, P. 2 Torino  
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Geograph. Soc.) .. .. Leyden  
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## FELLOWS.

(AUGUST 1879.)

## EXPLANATION OF THE LETTERS ATTACHED TO THE NAMES.

PRES. = present or past President.

C = present or past member of Council.

G = Gold Medal.

T = Testimonial of any other description.

S = School prize medal.

p = author of a Paper published in the 'Journal,' or 'Proceedings' of the Society.

\* = Life Compounder.

Year of Election.		
1876		Abbott, Major-General Saunders. 2, <i>Petersham-terrace, Queen's-gate, S.W.</i>
1878		Abbott,* William, Esq. 10, <i>Tokenhouse-yard, E.C.</i>
1868		Abbott,* Wm. S. D., Esq.
1874		Abd-El-Rasak Bey. <i>Naval College, Alexandria.</i>
1863		Abdy, Rev. Albert, M.A. <i>Broad-st., Stamford; and United University Club, S.W.</i>
1859		Aberdare, Right Hon. Lord. 1, <i>Queen's-gate, S.W.; and Duffryn, Aberdare, Glamorganshire.</i>
1851		Abinger, W. F. Scarlett, Lord. <i>Guards' Club, S.W.</i>
1876		Abrahams, Israel, Esq. 56, <i>Russell-square, W.C.</i>
1865		Acheson, Frederick, Esq., C.E. <i>Wooden Bridge, Co. Wicklow.</i>
1878		Acland, Rev. Chas. Lawford. <i>Royal Grammar-school, Colchester.</i>
1872		Acland, Dr. Henry, F.R.S., D.C.L., M.D. <i>Oxford.</i>
1861		Acland, J. Barton Arundel, Esq. <i>Mount Peel, Canterbury, New Zealand. Care of A. Mills, Esq., 34, Hyde-park-gardens, W.</i>
1874		Acland, Sir Thos. Dyke, Bart., M.P. <i>Killerton, Exeter; and Athenæum Club.</i>
1873	p.	Acland, Lieutenant W. A. Dyke, R.N. <i>Care of Dr. H. Acland, Oxford.</i>
1873		Adams, Fras. O., C.B., Esq. (Secretary of Embassy). <i>Paris.</i>
1878		Adderley, Augustus J., Esq. 3, <i>Porchester-gate, Hyde-park, W.</i>
1877		Adeane, Capt. E. S., R.N. 28, <i>Eaton-place, S.W.</i>
1873		Adkins, Thomas, Esq. <i>H.M. Consul at Newchicang, China.</i>
1876		Agar, A. P., Esq. <i>Care of Messrs. Grindlay and Co., 55, Parliament-street, S.W.</i>
1830	p.	Ainsworth,* W. F., Esq., F.S.A. <i>Ravenscourt-villa, New-road, Hammersmith, W.</i>
1876		Aird, David Alfred, Esq. 2, <i>Sussex-gardens, W.; and 7, Fig-tree-st., Temple, E.C.</i>
1859		Airlie, Right Hon. Earl of, K.T. 36, <i>Chesham-place, S.W.</i>



Year of  
Election.

1860		Aitchison, David, Esq. 5, <i>Pembroke-square, Bayswater, W.</i>
1873		Aitken, Russell, Esq. 36, <i>Great George-street, S.W.</i>
1830		Albemarle,* Right Hon. Earl of. 11, <i>Grosvenor-square, W.; Quiddenhall-hall, Larkingford, Norfolk; and Elvedon-hall, Suffolk.</i>
1862	PRES. p.	Alcock, Sir Rutherford, K.C.B., D.C.L., &c. 14, <i>Great Queen-street, Westminster, S.W.; and Athenæum Club, S.W.</i>
1838		Aldam,* William, Esq. <i>Frickley-hall, near Doncaster.</i>
1865		Aldom, Joseph R. Esq., M.A., PH.D. <i>Sahway-house, Leyton, Essex.</i>
1857		Aldrich, Captain Robert D., R.N. <i>Windmill-road, Croydon, Surrey.</i>
1830	P.	Alexander, General Sir Jas. Ed., K.C.L.S., F.R.A.S., F.R.S.E., &c. (14th Regt.). <i>United Service Club, S.W.; and Westerton-house, Bridge of Allan, N. B.</i>
1873		Alexander, W., Esq.
1874	P.	Alexanderson, Capt. Carl. <i>Care of A. E. Mylne, Esq., 3, Colville-road, E. Dulwich, S.E.</i>
1870		Alford, Lewis, Esq. 79, <i>Gloucester-terrace, Hyde-park, W.</i>
1878		Alison,* James, Esq. <i>Devonshire Club, St. James's, S.W.</i>
1857		Allan, G. W., Esq. <i>Moss Park, Toronto, Canada. Care of Major Aylmer, 50, Jermyn-street, S.W.</i>
1871		Allcroft,* John D., Esq. 108, <i>Lancaster-gate, W.; Harlington, Middlesex; and Stokesay, Shropshire.</i>
1874		Allen, C. F. R., Esq. H.M. Vice-Consul, <i>Shanghai. Care of G. B. Allen, Esq., 4, Paper-buildings, Temple, E.C.</i>
1864		Allen, C. H., Esq. 1, <i>West-hill, Highgate.</i>
1876	P.	Allen,* Herbert J., Esq., H.M. Consul, <i>Chinkiang. 10, The Norton, Tenby.</i>
1865		Allen, James Pearce, Esq. 13, <i>Waterloo-place, S.W.</i>
1873		Allen, John Seymour, Esq. <i>Woodfield, Pembroke; and Balliol College, Oxford.</i>
1879		Almack, Edward, Esq. <i>King's College Hospital, Lincoln's-inn, W.C.</i>
1862		Almeda,* Emanuel de, Esq. 11, <i>Hyde-park-gardens, W.</i>
1876		Alstone, John, Esq. <i>Western-road, Fortis-green, N.</i>
1377		Alt,* W. J., Esq. 3, <i>Holland-park-gardens, W.; and Thatched House Club, St. James's-street, S.W.</i>
1874		Altschul, Dr., M.A., F. R. HIST. S. 9, <i>Old Bond-street, W.</i>
1876		Ambler, Vincent, Esq., M.D. <i>Colville-house, Colville-square, Bayswater, W.</i>
1874		Ames, Capt. Lionel Neville Frederick. <i>The Hyde, Harpenden.</i>
1875		Ameuney, Professor Antonius, F.R.A.S.
1854		Ancona, J. S., Esq. 8, <i>John-street, Adelphi, W.C.</i>
1874		Anderson, Alex. Dunlop, Esq. <i>Ardsheal, Ballychulish, Argyllshire.</i>
1874		Anderson, Geo., Esq., Deputy Inspector-General of Army Hospitals. <i>Care of Sir Charles McGrigor and Co., Charles-street, S.W.</i>
1871		Anderson, Sir James. 16, <i>Warrington-crescent, W.</i>
1862		Anderson, James, Esq.
1876		Anderson, R., Esq. 58, <i>Lom ard-street, E.C.; and Hankow, China.</i>
1876	P.	Anderson, Capt. S., R.E., C.M.O. <i>Horse-Guards, Whitehall, S.W.; and Junior United Service Club, S.W.</i>

Year of Election.	
1870	Anderson, Wm. Jas., Esq. <i>Sans Souci, Newlands, near Cape Town, Cape of Good Hope. Care of Messrs. Sinclair, Hamilton and Co., 17, St. Helen's-place, E.C.</i>
1873	Anderson, Colonel W. W. <i>Lakefield, Glen Urquhart, Inverness.</i>
1876	Andrew, Capt. Chas. W.
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1867	Andrews, G. H., Esq. <i>The Cedars, New Brentford.</i>
1866	Andrews, John R., Esq. 14, <i>Bryanston-square, W.</i>
1875	Andrews, Thomas R., Esq., J.P. 4, <i>Cumberland-place, Regent's-park, N.W.</i>
1877	Andrews, Wm., Esq., C.E. <i>Care of E. Andrews, Esq., Strand-on-the-Green, Chiswick, Middlesex.</i>
1868	Angas, George F., Esq. 48, <i>Norland-square, Holland-park, W.</i>
1875	Angier, F. J., Esq. 79, <i>Gracechurch-street, E.C.</i>
1879	Annealey, A. A., Esq. (H.M. Consul at Réunion). <i>Care of W. R. Garrett, Esq., War-office, Pall-mall, S.W.</i>
1861	Ansell, Maurice, Esq. <i>Hanover-square Club, Hanover-square, W.</i>
1853	Ansted, Prof. D. T., M.A., F.R.S., &c. 1, <i>Princes-street, Westminster, S.W.; Athenæum Club, S.W.; and The Red Towers, Melton, Woodbridge.</i>
1879	Ansted, George L., Esq. 2, <i>Connaught-street, W.</i>
1873	Anstey, George A., Esq. <i>Windham Club, S.W.</i>
1874	Antrim,* Wm. Randal McDonnell, Earl of. <i>Glenarm-castle, Larne, Co. Antrim.</i>
1868	Arbuthnot, George, Esq. 23, <i>Hyde-park-gardens, W.</i>
1862	Arbuthnot, Lieut.-Col. George, R.H.A. 5, <i>Upper Eccleston-street, S.W.</i>
1876	Arbuthnot, Hugh L., Esq. 69, <i>Eaton-square, S.W.</i>
1872	Archibald, Wm. Fredk. A., Esq. 3, <i>Amersham-road, Putney, S.W.</i>
1870	Ardagh, Capt. John C., R.E. <i>Junior United Service Club, S.W.</i>
1855	Arden,* Richard Edward, Esq. <i>East Burnham-house, Buckinghamshire.</i>
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1863	Armitage, Edward, Esq. 3, <i>Hall-road, St. John's-wood, N.W.</i>
1867	Armitstead,* George, Esq., M.P. <i>Errol-park, Errol, N.B.</i>
1857	Armstrong, Sir Alexander, K.C.B., LL.D., F.R.S., <i>Director-General of the Navy Medical Department. 2d, Albany, W.; and Junior United Service Club, S.W.</i>
1875	Arnold, Edwin, Esq., C.S.I. <i>'Daily Telegraph' Office, Fleet-street, E.C.</i>
1875	Arnot, Hon. David. <i>Esdale, Albania, Griqualand West. Care of Messrs. White &amp; Holmes, Midway-chambers, 82, Bishopsgate-street-within, E.C.</i>
1876	Arnott, Thos. R., Esq. 38A, <i>Bridge-chambers, King William-street, E.C.</i>
1876	Arrowsmith, R., Esq. <i>Chiltern, Victoria, Australia. Care of D. W. Kettle Esq., 53, Fleet-street, E.C.</i>
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1872	Artlingstall, Geo., Esq., J.P. <i>Latchford-house, Warrington.</i>
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Year of Election.		
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1873		Ashton,* Captain Samuel Tudor. 7, <i>Palmeira-square, Brighton.</i>
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1876		Atkinson, E. T., Accountant-General. <i>Allahabad, N.W.P., India. Care of Miss Atkinson, 44, Church-road, St. Leonards-on-Sea.</i>
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1859	p.	Austen, Colonel Henry H. Godwin (24th Foot, Bengal Staff Corps). <i>Junior United Service Club, S.W.; and Shalford-house, near Guildford, Surrey.</i>
1863		Austin, John G., Esq. 71, <i>Harcourt-terrace, S.W.</i>
1854		Ayrton, Right Hon. Acton S. 1, <i>Courtfield-gardens, S.W.</i>
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1866		Bacon,* Geo. Washington, Esq. 127, <i>Strand, W.C.</i>
1873		Baden-Powell, Henry W. S., Esq. 3, <i>Paper-buildings, Temple, E.C.</i>
1864	p.	Badger, Rev. Geo. P. 21, <i>Leamington-road-villas, Westbourne-park, W.</i>
1873		Bagge, Sir William, Bt., M.P. <i>Stradsett-hall, Market Dovenham, Norfolk.</i>
1879		Baillie,* Nav. Lient. Chas. W. <i>Care of the Hydrographic-office, Admiralty, S.W.</i>
1857		Baillie, Major-General John (Bengal Staff Corps). <i>Care of Messrs. Grindlay and Co., 55, Parliament-street, S.W.</i>
1872		Baillie, Capt. Wm. Hunter. 43, <i>Norfolk-square, W.</i>
1878		Bain, A. J. G., Esq. <i>Blairnairn, Hellensburgh, N.B.</i>
1879		Bain, David, Esq. <i>St. Bride's Schools, Grey-street, Liverpool.</i>
1875		Bain,* Sir James, Knt. 2, <i>Park-terrace, Glasgow.</i>
1873		Baines, W. Mortimer, Esq. <i>Bell-hall, York.</i>
1878		Baker, Edwin, Esq. <i>Bruce-castle, Tottenham.</i>
1875		Baker,* George, Esq. 66, <i>Mark-lane, E.C.; and Snaresbrook.</i>
1861		Baker,* John, Esq.
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1877		Baker, Rev. Sir Talbot Hastings B., Bart. <i>Rauston, near Blandford, Dorset.</i>
1876		Baker, Colonel T. D., C.B. <i>Army and Navy Club, Pall-mall, S.W.</i>
1877		Baker, Rev. Wm. 4, <i>Clapton-square, Hackney.</i>
1855	p.	Baker,* Major W. T. <i>Junior United Service Club, S.W.</i>
1878		Baldwin, A. Chas., Esq.
1861		Balfour, Colonel David. <i>Balfour-castle, Kirkcaldy, N.B.</i>



Year of Election.		
1876		Balfour, Frederick Henry, Esq. <i>Shanghai.</i>
1847	C.	Balfour, Gen. Sir George, R.A., K.C.B., M.P. 6, <i>Cleveland-gardens, Hyde-park, W.; and Oriental Club, Hanover-square, W.</i>
1870		Balfour, Captain George M., R.N. <i>United Service Club, Pall-mall, S.W.</i>
1853		Balfour, John, Esq. 13, <i>Queen's-gate-place, S.W.</i>
1876		Ball, Arthur Edmund, Esq. <i>Tyne-villa, The Platt-field, Putney, S.W.</i>
1860	C.	Ball, John, Esq., F.R.S. 10, <i>Southwell-gardens, South Kensington.</i>
1876		Ball, John B., Esq. <i>Carisbrooke-lodge, St. John's-road East, Putney, S.W.</i>
1872		Balls, W. H., Esq. 20, <i>Anerley-road, Anerley, S.E.</i>
1852		Bancroft, Col. W. C. (16th Regt.). <i>Barracks, Fulwood, Preston, Lancashire.</i>
1873		Bandini, His Highness Prince Giustiniani. <i>Rome. Care of Messrs. Baring Brothers and Co., 8, Bishopsgate-street-within, E.C.</i>
1878		Banks, Henry B., Esq. 31, <i>Lombard-street, E.C.</i>
1872		Barber, Wm. Cambridge, Esq. <i>Crossley Orphan Home and School, Savile-park, Halifax.</i>
1874		Barbour, W. Boyle, Esq. <i>Springvale, Hilton-lane, Prestwich, near Manchester.</i>
1869		Barchard, Francis, Esq. <i>Horsted-place, Uckfield.</i>
1879		Barclay,* Charles Arthur, Esq. <i>Nutfield-court, Nutfield, Surrey.</i>
1873		Barclay, Hugh G., Esq. <i>Monkhams, Woodford, Essex.</i>
1870		Barclay, Wm. L., Esq., B.A. <i>The Briers, Reigate, Surrey.</i>
1863		Barford, A. H., Esq., M.A. 1, <i>Cornwall-terrace, Regent's-park, N.W.</i>
1835		Baring,* John, Esq. <i>Oakwood, Chichester.</i>
1870	C. p.	Barkly, Sir Henry, G.C.M.G., K.C.B. 1, <i>Bina-gardens, South Kensington, S.W.</i>
1862		Barlee, Frederick Palgrave, Esq., C.M.G. (Governor of British Honduras). <i>Care of G. Lawrence, Esq., 12, Marlborough-road, Lee, S.E.</i>
1868		Barlow, Frederick Thomas Pratt, Esq. 26, <i>Rutland-gate, S.W.</i>
1871		Barnes, Robert, Esq., M.D. 15, <i>Harley-street, W.</i>
1867	P.	Barns,* John W., Esq. <i>Bhanulpore, Punjab, India. Care of Messrs. Grindlay, 55, Parliament-street, S.W.</i>
1870		Barr, Edward G., Esq. 76, <i>Holland-park, W.; and 36, Mark-lane, E.C.</i>
1873		Barrett, Benjamin, Esq. <i>Albert-cottage, Framlingham, Suffolk.</i>
1875		Barrett, Howard, Esq., M.R.C.S. 3, <i>Tavistock-square, W.C.</i>
1859		Barrington, George, Viscount, M.P. 19, <i>Hertford-street, W.</i>
1867		Barrington-Ward,* Mark J., Esq., M.A., F.L.S. (Her Majesty's Inspector of Schools). <i>St. Winifred's, Lincoln; and United University Club, S.W.</i>
1833		Barrow, John, Esq., F.R.S., F.S.A. 17, <i>Hanover-terrace, Regent's-park, N.W.</i>
1877		Barrow, Reuben Vincent, Esq. <i>Sydney-lodge, Croydon.</i>
1878		Barrow, Samuel, Esq., jun. <i>Lorne-house, Red-hill, Surrey.</i>
1863		Barry, Alfred, Esq. <i>St. Bride's Office, 33, Mark-lane, E.C.</i>
1857		Bartholomew, John, Esq. 17, <i>Chambers'-street, Edinburgh.</i>
1879		Bartlett, Edward J., Esq. <i>St. Helen's, Cazenove-road, Stamford-hill.</i>
1862	P.	Barton, Alfred, Esq., M.D. <i>Oriental Club, W.; and Myshkyns, Ticehurst, Hawk-hurst.</i>

Year of Election.	
1837	Bateman,* James, Esq., F.R.S., F.L.S. 9, <i>Hyde-park-gate South, S.W.</i>
1876	Bateman, John, Esq. <i>Great Bromley-lodge, Colchester.</i>
1859	Bateman, John F., Esq., C.E., F.R.S. 16, <i>Great George-street, Westminster, S.W.</i>
1875	Bates, Major C. E. <i>Care of Messrs. Grindlay and Co., 55, Parliament-street, S.W.</i>
1873	Bates, General Sir Henry, K.C.B. 2, <i>Sussex-place, Hyde-park, W.</i>
1879	Bates, Rev. J. C. <i>The Vicarage, Castleton, near Manchester.</i>
1866	Bateson-de-Yarburgh, George, Esq. <i>Heslington-hall, York.</i>
1877	Batt, Edward W., Esq. 20, <i>Great Winchester-street, E.C.</i>
1873	Batten, Henry Howard, Esq. 11, <i>Scarsdale-villas, Kensington, W.; and Junior Carlton Club, Pall-mall, S.W.</i>
1866	Batten, John H., Esq. 5, <i>Mansten-terrace, Heavitree, Exeter.</i>
1858	Baxendale, Joseph H., Esq. <i>Worplesdon, Guildford.</i>
1867	Baxter, Richard, Esq., Barrister-at-Law. 32, <i>Leinster-gardens, Bayswater, W.</i>
1863	Bayley, H., Esq. <i>Peninsular and Oriental Co., Leadenhall-street, E.C.</i>
1873	Baylis,* Major E. W. D. <i>The Glen, Penally, S. Wales.</i>
1862	Bayly, Maj.-Gen. John, R.E., C.B. <i>Ordnance Survey Office, Southampton.</i>
1872	Baynes,* A. Henry, Esq. 19, <i>Castle-street, Holborn, E.C.</i>
1878	Baynes, Donald, Esq., M.D. 37, <i>Southernhay, Exeter.</i>
1872	Baynes,* Wm. Wilberforce, Esq., D.L. <i>Campbelton-house, Croydon.</i>
1868	Baynton, Captain Edward. <i>Trafalgar-lodge, Shirley, Southampton.</i>
1874	Bench, W. J., Esq. 24, <i>Fenchurch-street, E.C.</i>
1871	Beadon, Sir Cecil, K.C.S.I. 4, <i>Lezham-road, Kensington, W.</i>
1874	Beall, Geo., Esq., Secretary Local Marine Board. <i>Liverpool.</i>
1874	Beardmore, Nathaniel St. B., Esq. 30, <i>Great George-street, S.W.</i>
1872	Beaton, Capt. John. 13, <i>Palace-gardens-terrace, W.</i>
1854	Beaufort,* William Morris, Esq., F.R.A.S., F.L.S., F.S.S. <i>Athenaeum Club, S.W.</i>
1875	Beaumont, A. R. de, Esq. 19, <i>St. John's-park, Highgate, N.</i>
1856	Beaumont, John Aug., Esq. 81, <i>Lancaster-gate, W.; and Wimbledon-park-house, Wimbledon, S.W.</i>
1877	Beaumont, Commander Lewis A., R.N. <i>H.M.S. "Excellent."</i>
1870	Beaumont,* Somerset, Esq. <i>Hurstcoote, Shere, near Guildford.</i>
1851	Beaumont,* Wentworth B., Esq., M.P. 144, <i>Piccadilly, W.; and care of G. E. Marindy, Esq., Eton College, Windsor.</i>
1872	Beavan, Lieut. Reginald. <i>Messrs. Grindlay and Co., 55, Parliament-street, S.W.</i>
1867	Beazeley,* Michael, Esq., M.I.C.E. <i>Care of J. D. Campbell, Esq., 8, Storey's-gate, S.W.</i>
1871	Beazley, Major Geo. G. (83rd Regiment). <i>Army and Navy Club, S.W.</i>
1865	Bebb, Horatio, Esq. 13, <i>Gloucester-place, W.; and Leamington.</i>
1870	Bective,* Thomas, Earl of. <i>Underley-hall, Kirkby Lonsdale, Westmoreland.</i>
1875	Bedbrook, W. H., Esq. <i>Blenheim-house, Wimbledon, S.W.</i>
1874	Beech, Geo. Müller, Esq. <i>Care of George Kohle, Esq., 100, Lenthall-road, Dalston, E.</i>



Year of Election.		
1870		Beer,* Julius, Esq. 27, <i>Portland-place, W.</i>
1861		Begbie,* James, Esq. 2, <i>East-India-avenue, Leadenhall-street, E.C.</i>
1860		Begbie, Thomas Stirling, Esq. 36, <i>Wallbrook, E.C.</i>
1853		Belcher, Rev. Brymer. <i>St. Gabriel's; and 32, Warwick-square, Pimlico, S.W.</i>
1874		Bell, H. Douglas, Esq. 4, <i>Albion-terrace, Cleethorpes, Lincolnshire.</i>
1875		Bell,* Joshua P., Esq.
1876		Bell, Thomas, Esq. 15, <i>Upper-park-road, Haverstock-hill, N.W.</i>
1868	P.	Bell, Wm. A., Esq., B.A., M.D. <i>New University Club, St. James's-street, S.W.</i>
1871		Bell, Major W. M. 40, <i>Pall-mall, S.W.</i>
1874		Bell, William Moore, Esq. 37, <i>Charterhouse-square, E.C.</i>
1864		Bellamy, Edward, Esq. 14, <i>Buckingham-street, Adelphi, W.C.</i>
1872	P.	Bellville, Alfred, Esq. 20, <i>Penn-road-villas, Holloway, N.</i>
1863		Belmore, Right Hon. The Earl of, K.C.M.G. 95, <i>Eaton-place, S.W.</i>
1873		Benjamin, Horace B., Esq. 169, <i>New Bond-street, W.</i>
1870		Benjamin, Joseph, Esq.
1875		Benke, Albert, Esq., M.A.
1857		Bennett, J. Risdon, Esq., M.D. 22, <i>Cavendish-square, W.</i>
1856		Benson,* William, Esq. <i>Langtons, Alresford, Hants.</i>
1830		Bentham, George, Esq., Pres. L.S. 25, <i>Wilton-place, S.W.</i>
1868		Bentley, George, Esq. <i>Upton-park, Slough.</i>
1870		Benyon, Wm. H., Esq. <i>West-lodge, Ripon.</i>
1859		Berens, H. Eulse, Esq. <i>Sidcross, Foot's Cray, Kent.</i>
1865		Bernard, P. N., Esq. 37, <i>Connaught-square, Hyde-park, W.</i>
1874		Bernays, Louis A., Esq. <i>Care of A. FitzGibbon, Esq., The Rookery, Stanmore, Middlesex.</i>
1879		Berridge,* Robert, Esq. 15, <i>Highbury-grove, N.</i>
1876		Berryman, Edwin W., Esq. 32, <i>Great St. Helen's, E.C.</i>
1872		Berthon, Peter Hy., Esq. 20, <i>Margaret-street, Cavendish-square, W.</i>
1871		Best, Commr. Jno. Chas. <i>Plas-yn-Vivod, Llangollen.</i>
1867		Bethune, Alexander M., Esq. <i>Otterburn, Hamlet-road, Upper Norwood; and 122, Leadenhall-street, E.C.</i>
1842	P.	Bethune,* Adm. C. R. Drinkwater, C.B. 4, <i>Queensberry-place, S.W.</i>
1836		Betts, John, Esq. 21, <i>Freegrove-road, Camden-road, N.</i>
1866		Bevan, William, Esq. 12, <i>Bolton-gardens, South Kensington, S.W.</i>
1876		Bevington, Henry Geo., Esq. <i>Ferndale-house, Lee, S.E.</i>
1876		Bevington, Herbert S., Esq., B.A. <i>Ferndale-house, Lee, S.E.</i>
1877		Bianchi, The Marchese. <i>Hanover-square Club, W.</i>
1873		Bibby,* Edward, Esq. <i>Care of John Bibby, Esq., Hart-hill, Liverpool.</i>
1862		Bicker-Caarten, Peter, Esq., Corr. Mem. and Agent Geogr. Soc. of the Netherlands. 30, <i>Northumberland-place, Bayswater, W.</i>
1875		Bickers, Edward, Esq., J.P. <i>Care of Messrs. King and Co., Cornhill, E.C.</i>
1876		Bickerstaff, W. M., Esq., J.P. 13, <i>Highbury-terrace, N.</i>



Year of Election.		
1871		Bickersteth, The Very Rev. Edward, D.D., Dean of Lichfield. <i>The Deanery, Lichfield.</i>
1879		Bickford-Smith, * W., Esq. <i>Trevarno, Helston, Cornwall.</i>
1868	p.	Bickmore, * A. S., Esq., M.A., PH.D., Superintendent of the American Museum of Natural History. <i>Central-park, New York.</i>
1866		Bicknell, Algernon S., Esq. 23, <i>Onslow-gardens, South Kensington.</i>
1871		Biddulph, Geo. Tournay, Esq. 43, <i>Charing-cross, S.W.</i>
1874		Biddulph, John, Esq. <i>Swansea.</i>
1865		Bidwell, Charles Toll, Esq. <i>Foreign-office, S.W.</i>
1859		Bigge, Frederick W., Esq. <i>Warendon-house, Woburn.</i>
1868		Biggs, C. H. Walker, Esq. 7, <i>Freelands-road, Bromley, Kent.</i>
1876		Biggs, Jas., Esq., R.N.
1876	p.	Bigg-Wither, * T. P., Esq., C.E.
1850		Bigby, John J., Esq., M.D., F.R.S. 89, <i>Gloucester-place, Portman-square, W.</i>
1858		Birch, John William, Esq. 27, <i>Cavendish-square, W.</i>
1862		Birchill, * Captain B. H. H. <i>Junior Carlton Club, S.W.</i>
1872		Bird, * Richard, Esq. <i>Holt-house, Fulham, S.W.</i>
1874		Birdwood, Geo., Esq., M.D., C.S.I. <i>India Museum, South Kensington, S.W.; and Acton, W.</i>
1875		Birkbeck, Edw., Esq. <i>Horstead-hall, Norwich.</i>
1878		Birks, Harry William, Esq. 161, <i>Brecknock-road, Tufnell-park, N.W.</i>
1867		Bischoffsheim, * Henri Louis, Esq. 75, <i>South Audley-street, W.</i>
1858		Bishop, George, Esq., F.R.A.S. <i>Union Club, S.W.; and The Meadows, Twickenham, S.W.</i>
1861		Bishop, James, Esq.
1876		Bishop, James, Esq. <i>Forest-row, Leytonstone.</i>
1870		Bishop, Wm. Henry, Esq. <i>Culverden-lodge, Tunbridge Wells.</i>
1867		Bisson, Capt. Frederick S. de Carteret. 70, <i>Berners-street, W.</i>
1870		Black, Andrew H., Esq. 23, <i>Royal-crescent, Glasgow.</i>
1860		Black, * Francis, Esq. 6, <i>North-bridge, Edinburgh.</i>
1878		Black, Major Geo. Robt. Stewart. <i>Roxeth, Harrow; and Junior United Service Club, Charles-street, S.W.</i>
1849		Blackie, W. Graham, Esq., PH.D. 17, <i>Stanhope-street, Glasgow.</i>
1862		Blackstone, * Frederick Elliot, Esq., B.C.L. 2, <i>Caroline-street, Bedford-square, W.C.</i>
1873		Blagden, Robert, Esq. <i>Junior Carlton Club, Pall-mall, S.W.</i>
1869		Blaine, Henry, Esq. 11, <i>Gledhow-gardens, South Kensington, S.W.</i>
1874		Blair, Major H. F., R.E. 1, <i>Clarendon-place, Hyde-park-gardens, W.</i>
1865		Blake, Brig.-Gen. H. W. 10, <i>Stanhope-street, Hyde-park-gardens, S.W.</i>
1857		Blake, * Wollaston, Esq., F.R.S. 8, <i>Devonshire-place, W.</i>
1872		Blakenmore, Ramsey, Esq. <i>Woodlands, Chislehurst, Kent.</i>
1861		Blakeney, * William, Esq., R.N. <i>Secretary to Hydrographic-office, S.W.</i>
1876	p.	Blakeney, Captain W. A. F.

Year of Election.		
1868		Blakiston, Matthew, Esq. 18, <i>Wilton-crescent, S.W.</i>
1857	Cr. p.	Blakiston, Captain Thomas, R.A. 18, <i>Wilton-crescent, S.W.</i>
1868	p.	Blanc, Henry, Esq., M.D., &c. <i>Care of Messrs. H. S. King and Co., 45, Pall-mall, S.W.</i>
1874		Blanch, Jno., Esq. <i>Care of W. H. Blanch, Esq., 11, Denman-road, Peckham, S.E.</i>
1873		Blanford,* W. T., Esq., F.G.S. <i>Geological Survey-office, Calcutta. Care of Messrs. Trübner and Co., Ludgate-hill, E.C.</i>
1857		Blanshard, Richard, Esq. <i>Fairfield, Lymington, Hants.</i>
1839		Blewitt,* Octavian, Esq. 10, <i>John-street, Strand, W.C.</i>
1864		Blore, Edward, Esq., D.C.L., F.R.S., F.S.A., &c. 4, <i>Manchester-square, W.</i>
1875		Blount, Edward, Esq., C.B. 28, <i>Old Burlington-street, W.; and 61, Rue de Courcelles, Paris.</i>
1866		Blow, William Wootton, Esq. <i>Oak-lodge, Ryden's-road, Walton-on-Thames.</i>
1868		Blumberg, George F., Esq. <i>Mansfield-house, Clifton-gardens, Maida-vale, W.</i>
1872		Blundell,* Charles Weld, Esq. <i>Ince, Blundell-hall, Great Crosby; and Brooks's Club, S.W.</i>
1837		Blunt,* Jos., Esq.
1863		Blunt,* Wilfred S., Esq. <i>Worth, Crawley, Sussex.</i>
1878		Blyth, Sir Arthur, K.C.M.G. (Agent-Gen., <i>South Australia</i> ). 51, <i>Linden-gardens, Kensington, W.</i>
1871		Blyth, Henry, Esq. 53, <i>Wimpole-street, W.</i>
1868		Blyth, Philip P., Esq., J.P. 53, <i>Wimpole-street, W.</i>
1871		Bodenham,* Chas de la Barre, Esq. <i>Rotherwas, Hereford.</i>
1858		Bohn, Henry G., Esq. 18, <i>Henrietta-street, Covent-garden, W.C.; and North-end-house, Twickenham.</i>
1874		Boileau, Colonel G. W. <i>Stanfield-hall, Wymondham.</i>
1877		Bolton,* John, Esq. 13, <i>Long Acre, W.C.</i>
1861		Bompas, George Cox, Esq. 15, <i>Stanley-gardens, Kensington-park, W.</i>
1861		Bonney, Charles, Esq. <i>Adelaide, Australia.</i>
1858		Bonnor, George, Esq. 49, <i>Pall-mall, S.W.; and 2, Bayswater-terrace, Kensington-square, W.</i>
1865		Bonwick, James, Esq. <i>St. Kilda, Melbourne. Care of W. Beddow, Esq., 22, South Audley-street, W.</i>
1872		Booker, Samuel, Esq. 47, <i>Albany, Old Hall-street, Liverpool.</i>
1866		Booker, Wm. Lane, Esq. (H.B.M. Consulate, <i>San Francisco</i> ). <i>Care of Messrs. King and Co., 45, Pall-mall, S.W.</i>
1876		Boor, Geo. C., Esq. <i>Leonard-house, Green-lanes, Stoke-Newington, N.</i>
1874		Booth, John, Esq. <i>Training College, Exeter.</i>
1878		Booth, Stephen, Esq. 18, <i>Blomfield-street, Upper Westbourne-terrace, W.</i>
1875		Borlase, Capt. Jno. 2, <i>Upton-villas, Haven-green, Ealing, W.</i>
1879		Borman, Allan W., Esq. <i>Gloucester-house, Lime-grove, Uxbridge-road, W.</i>
1845		Borrer,* Dawson, Esq. <i>Altmont Ballon, Co. Carlow, Ireland.</i>
1878		Bose,* William, Esq. <i>Whitehall-yard, Woodford, Essex.</i>



Year of Election.		
1878		Bourgho, Thos. J. de, Esq. 161, Brecknock-road, Tuffnell-park, N.W.
1875		Bourne, Geo., Esq. Brisbane, Queensland. Care of Mr. John Taylor, 110, Fenchurch-street, E.C.
1871		Bourne, John, Esq., C.E. 21, Richmond-road, Bayswater, W.
1874		Bourne, Robert, Esq., J.P. Grafton-manoir, Bromsgrove.
1872		Bousfield, William, Esq., M.A. 33, Stanhope-gardens, Queen's-gate, S.W.
1860		Boustead, John, Esq. 34, Craven-street, Strand, W.C.
1866		Boucher, * Emanuel, Esq. 12, Oxford-square, Hyde-park, W.
1865		Bouverie, P. P., Esq. 32, Hill-street, Berkeley-square, W.
1876		Bowden, A., Esq. 390, St. Vincent-street, Glasgow.
1867		Bowell, Rev. Wm. Chandos-house, Hereford.
1861		Bowen, * Charles Christopher, Esq. Christchurch, Canterbury, New Zealand. Care of A. O. Ottynell, Esq., 7, Westminster-chambers, S.W.
1854	p.	Bowen, * Sir George Ferguson, G.C.M.G., M.A. (Governor of Mauritius). Care of Messrs. Cocks, Biddulph and Co., 43, Charing-cross, S.W.; and Athenaeum Club, Pall-mall, S.W.
1871		Bowers, * Captain Alexander. Care of Messrs. Fraser and Co., Penang.
1871		Bowes, John, Esq. Warrington, Lancashire.
1862		Bowie, John, Esq. Conservative Club, S.W.
1869		Bowker, James Henry, Esq. Basutoland, South Africa. Care of Messrs. King and Co., Cornhill, E.C.
1878		Bowles, John, Esq. Landport, Portsmouth.
1868		Bowly, William, Esq. Cirencester.
1876		Bowman, Wm., Esq., F.R.S. 5, Clifford-street, W.
1865		Bowring, John Charles, Esq. Forest-farm, Windsor Forest.
1866		Bowring, Samuel, Esq. 1, Westbourne-park, W.
1868		Bowser, Alfred T., Esq. Sunnyside, Kenninghall-road, Upper Clapton.
1845		Boyd, * Edward Lennox, Esq., F.S.A. 35, Cleveland-square, Hyde-park, W.
1876		Boyd, Nelson, Esq.
1877		Boyd, Dr. R. Southall-park, Middleser.
1874		Boyd, William, Esq., M.A., F.R.S.E., F.S.A., &c. Peterhead, Aberdeenshire.
1876		Boyer, George Phelps, Esq. 8, Warwick-crescent, Maida-hill, W.
1869		Boyle, Richard Vicars, Esq., C.S.I. (Engineer in Chief to the Government Railways and Telegraph, Japan). Care of Messrs. Grindlay and Co., 55, Parliament-street, S.W.
1874		Boyson, Ambrose P., Esq. East-hill, Wandsworth, S.W.
1876		Bradshaw, * Surg.-Major A. F. Simla, India. Care of Messrs. Holt and Co., 17, Whitehall-place, S.W.
1870		Bragge, * William, Esq., C.E. Shirle-hill, Hanstead-road, Birmingham.
1862		Braithwaite, Isaac, Esq. 27, Austin Friars, E.C.
1863		Bramley-Moore, * John, Esq. Langley-lodge, Gerrard's-cross, Bucks.
1859		Brand, * James, Esq. 109, Fenchurch-street, E.C.
1878		Brand, * James, Esq. Bedford-hill, Balham; and 37, New Broad-street, E.C.

Year of Election.		
1874		Brand, Jno. Hy., Esq. President of the Orange Free State Republic, S. Africa. <i>Care of Henry Blyth, Esq., 53, Wimpole-street, W.</i>
• 1872		Brander, Captain William M. (24th Foot). <i>Army and Navy Club, Pall-mall, S.W.</i>
1867		• Brandis, Dr. D., F.L.S. <i>Director of Forests, Calcutta. Care of W. H. Allen, Esq., 13, Waterloo-place, S.W.</i>
1876		Brandon, David, Esq. 24, <i>Berkeley-square, W.</i>
1878		Brandreth, Edward Lyall, Esq. 32, <i>Elvaston-place, Queen's-gate, S.W.</i>
1874		Brandreth,* Hy. P., Esq. <i>Standish-rectory, Wigan, Lancashire.</i>
1875		Branson, W. Powell, Esq. 23, <i>Rectory-grove, Clapham, S.W.; and 155, Fenchurch-street, E.C.</i>
1877		Brass, Emil, Esq. <i>Care of Messrs. Blatzpiel, Stamp and Heacock, 38, Knight-rider-street, Queen Victoria-street, E.C.</i>
1871		Brassey,* Thos., Esq., M.P. 24, <i>Park-lane, W.; and Normanhurst-court, Battle.</i>
1874		Bray, Joseph, Esq., C.E. 51, <i>Queen's-gate-gardens, S.W.</i>
1859		Braybrooke, Philip Watson. <i>Studley, Bishop's Down Park, Tunbridge Wells.</i>
1875		Brazza, Pierre Savorgnan de. <i>Paris.</i>
1874		Brent, Algernon, Esq. <i>Audit-office, Somerset-house, W.C.</i>
1834		Breton,* Commr. Wm. Henry, R.N., F.G.S. 15, <i>Camden-crescent, Bath; and The Rectory, Charmouth, Dorset.</i>
1876		Brett, Right Hon. Sir W. Balliol, Knt. 6, <i>Ennismore-gardens, Prince's-gate, S.W.</i>
1876		Bridal, Walter Geo., Esq. <i>Granville C. School, St. Lawrence-on-Sea.</i>
1867		Bridge, John, Esq. <i>Heatley-house, Heatley, near Warrington.</i>
1874		Bridgeman, Granville, Esq. <i>Holme-lodge, Balham-road, Upper Tooting; and Junior Conservative Club, King-street, St. James's.</i>
1876		Bridger, R. Lowther, Esq. <i>New University Club, St. James's-street, S.W.</i>
1873		Bridger, Captain W. Milton, R.N. <i>St. Stephen's Club, Westminster, S.W.</i>
1858		Bridges, Nathaniel, Esq. <i>Blackheath-park, S.E.</i>
1877		Bridges,* Commander W. B., R.N. <i>H.M.S. "Wolverine," Australia. Care of Messrs. J. W. Bridges and Sons, 5A, Warnford-court, E.C.</i>
1852	p.	Brierly,* Oswald W., Esq. 38, <i>Amptill-square, N.W.</i>
1865		Briggs, Colonel J. P. <i>Bonjedward-house, Jedburgh.</i>
1861	p.	Bright,* Sir Charles T., F.R.A.S. 11, <i>Delahay-street, Westminster, S.W.</i>
1868		Bright, Henry Arthur, Esq. <i>Ashfield, Knotty Ash, Liverpool.</i>
1860		Bright, James, Esq., M.D. 6, <i>Holyrood-place, Plymouth.</i>
1876		Bright-Smith, Rev. G. Aug. <i>Buscot-lodge, Maida-hill, W.</i>
1854		Brine, Colonel Frederic, R.E., K.T.S., Assoc. Inst. C.E., F.Z.S. 45, <i>Victoria-street; Army and Navy, Athenaeum, and United Service Clubs, S.W.; and Garrick Club, W.C.</i>
1856	p.	Brine, Captain Lindsay, R.N. <i>Boldre-house, Lymington, Hants; and United Service Club, S.W.</i>
1861		Bristowe, Henry Fox, Esq. 22, <i>Old-square, Lincoln's-inn, W.C.</i>
1875		Broadmead,* Jas. B., Esq., B.A. <i>United University Club, Suffolk-street, Pall-mall East, S.W.</i>
1861		Brodie, Walter, Esq. <i>Orsett-house, Orsett-terrace, Hyde-park, W.</i>



Year of Election.		
1861		Brodie, William, Esq. <i>Eastbourne, Sussex.</i>
1874		Brodrick, William Adams, Esq. <i>Care of Rev. W. K. Brodrick, St. Martin's Church, Brighton.</i>
1863	C.	Brodrick,* The Hon. George C. 32A, Mount-street, W.
1874		Brogden, James, Esq. 21, Queen Anne's-gate, Westminster, S.W.
1876		Brooke, Commr. A. T., R.N. <i>Ashbrooke, Brookboro', Lismaskea, Ireland.</i>
1874		Brooke, Chas., Esq. ( <i>Rajah of Sarawak</i> ).
1864		Brooke,* Sir Victor A., Bart. <i>Colebrooke-park, Co. Fermanagh, Ireland.</i>
1875		Brooke, Capt. W. Saurin (Beng. Staff Corps).
1872		Brookes, Clifford J., Esq. <i>The Grange, Nightingale-lane, Clapham-common, S. W.</i>
1862		Brookes, Thomas, Esq. <i>Mattock-lane, Ealing, W.</i>
1856		Brooking,* Marmaduke Hart, Esq.
1877		Brooks, Joseph, Esq. <i>Survey-office, Adelaide, South Australia.</i>
1876		Brooks, Robert Alexander, Esq. <i>Conservative Club, St. James's-street, S.W.</i>
1870		Brooks,* Wm. Cunliffe, Esq., M.P., M.A., F.S.A., &c. 5, Grosvenor-square, W.; <i>Barlow-hall, near Manchester; and Forest of Glen-Tanar, Aboyne, Aberdeenshire.</i>
1863		Broughall,* William, Esq. <i>Broadwater, Down, Tunbridge Wells.</i>
1856		Brown,* Daniel, Esq.
1868		Brown, Colonel David (Madras Staff Corps). <i>India.</i>
1874		Brown, Rev. Dixon. 28, Queen's-gate, S. Kensington, S.W.
1877		Brown, E. A., Esq. <i>Burton-on-Trent.</i>
1877	p.	Brown, Rev. George. <i>Care of the Wesleyan Missionary Society, 17, Bishops-gate-street-within, E.C.</i>
1877		Brown, Henry Rowland, Esq. 56, Lincoln's-inn-fields, W.C.; and <i>Oxley-grove, Stanmore.</i>
1874		Brown, J. B. Esq. 90, Cannon-street, E.C.; and <i>Bromley, Kent.</i>
1865		Brown,* James R., Esq., F.R.S.N.A., Copenhagen. 14, <i>Hilldrop-road, Camden-road, N.</i>
1861		Brown,* John Allen, Esq. <i>Dahlwell-lodge, Kent-gardens, Ealing, W.</i>
1867		Brown, Richard, Esq., C.E. 115, <i>Lansdowne-road, Notting-hill, W.</i>
1867	p.	Brown, Robert, Esq., M.A., F.I.D., F.L.S., &c. 26, <i>Guilford-road, Albert-square, S.W.</i>
1858		Brown,* Thomas, Esq. 8, <i>Hyde-park-terrace, Hyde-park, W.</i>
1876		Brown,* Rev. Thos. E. <i>Clifton-college, Bristol.</i>
1859		Brown, William, Esq. <i>Quarry-hill-house, Tonbridge, Kent.</i>
1879		Brown, William, Esq. 12, <i>D'Olier-street, Dublin.</i>
1864		Browne,* Captain E. P. Wade. 35, <i>Charles-street, Berkeley-square, W.</i>
1863		Browne, H. H., Esq. <i>Moor-close, Binfield, Bracknell.</i>
1858		Browne,* John H., Esq. <i>Glenhus, Bays-hill, Cheltenham.</i>
1869		Browne, Samuel Woolcott, Esq. 58, <i>Porchester-terrace, Hyde-park, W.</i>
1874		Browne, Walter Raleigh, Esq., C.E. 38, <i>Belgrave-road, S.W.</i>
1870		Browne, Wm. A. Morgan, Esq. <i>London Athenaeum Club, Suffolk-street, Pall-mall, S.W.</i>

Year of Election.		
1877		Browne, Rev. W. E. <i>West Walton, Wisbeach.</i>
• 1858		Browne, William J. Esq. 74, <i>Gloucester-road, South Kensington, S. W.</i>
1869		Browning, G. F., Esq. <i>The Chalet, Kingswood, Dulwich-wood-park, S.E.</i>
1852		Browning, H., Esq. 73, <i>Grosvenor-street, Grosvenor-square, W.; and Old Warden-park, Biggleswade.</i>
1856		Browning,* Thomas, Esq. 6, <i>Whitehall, S. W.</i>
1863	P.	Brunton, John, Esq., M.I.C.E., F.G.S. 13A, <i>Great George-street, S. W.</i>
1873		Brunton, R. H., Esq., F.G.S., &c. (Young's Paraffine Light Co.). <i>Bathgate, Scotland.</i>
1856		Bryant, Walter, Esq., M.D., F.R.C.S. 23A, <i>Sussex-square, Hyde-park-gardens, W.</i>
1867		Buclench,* His Grace the Duke of, K.G., F.R.S. <i>Dalkeith-palace, near Edinburgh; and Montagu-house, Whitehall, S. W.</i>
1874		Buchanan, R. Dunlop, Esq. 16, <i>Porchester-terrace, W.</i>
1874		Buchanan,* Thos. Ryburn, Esq. <i>All Souls' College, Oxford.</i>
1869		Buckley, John, Esq. 16, <i>Jolimont-street, Jolimont, East Melbourne, Victoria. Care of Messrs. Dalgety, Du Croz, and Co., 52, Lombard-street, E.C.</i>
1876		Buckley, John, Esq. <i>The Academy, Weaver-view, Winsford, Cheshire.</i>
1863		Budd, J. Palmer, Esq. <i>Ynisdaren, near Swansea.</i>
1867		Bulger,* Lieut.-Colonel George Ernest, F.L.S., F.M.S., C.M.Z.S., &c. (late 10th Foot). <i>Care of Messrs. Wheatley and Co., 156, Leadenhall-street, E.C.</i>
1868		Bull,* William, Esq., F.L.S. <i>King's-road, Chelsea, S. W.</i>
1865		Buller, Sir Edward M., Bart., M.P. <i>Dilhorn-hall, Cheadle, Staffordshire.</i>
1869		Buller, Walter L., Esq., C.M.G., F.L.S. 7, <i>Westminster-chambers, Victoria-st., S. W.</i>
1875		Bullinger, Rev. E. Wm. <i>Walthamston, Essex.</i>
1863		Bullock, Captain Charles J., R.N.
1875		Bullock, Rev. Wm. T., M.A. <i>Kensington-palace, W.</i>
1860		Banbury,* Sir Charles James Fox, Bart., F.R.S. <i>Barton-hall, Bury St. Edmund's.</i>
1839	C.	Banbury, E. H., Esq., M.A. 35, <i>St. James's-street, S. W.</i>
1863		Bundock, F., Esq. <i>Buckland-abbey, Horrabridge, S. Devon.</i>
1866		Burgess,* James, Esq., M.R.A.S. (Archæological Reporter, &c., to Government, Bombay). 8, <i>Merchiston-terrace, Edinburgh. Care of Messrs. Trübner and Co., Ludgate-hill, E.C.</i>
1875		Burgoynne, John, Esq. <i>Woodthorpe, Stonebridge-park, Willesden.</i>
1871		Burke,* Samuel Constantine, Esq. 21, <i>Leinster-square, Bayswater, W.</i>
1864		Burn-Blyth, Robert, Esq. 5, <i>Clifton-place, Sussex-square, W.</i>
1872		Burne, Lieut.-Colonel Sir O. F., K.C.S.I., C.I.E. <i>India-office, S. W.</i>
1878		Barnett, Jas. Compton, Esq., M.D. 17, <i>Hanover-square, Birkenhead.</i>
1871		Barney, Commr. Chas., R.N., <i>Superintendent Greenwich Hospital Schools, S.E.</i>
1863		Burns,* John, Esq. <i>Castle Wemyss, by Greenock, N. B.</i>
1861		Burr,* Higford, Esq. 23, <i>Eaton-place, S. W.; and Aldermaston-court, Berkshire.</i>
1857		Burstal, Captain E., R.N. 9, <i>Park-villas, Lower Norwood, S.E.</i>
1872		Bart, Charles, Esq. <i>Hill-side-house, Richmond, Surrey.</i>



Year of Election.		
1878		Burt, Frederick, Esq. 71-2, Cornhill, E.C.; and Woodstock, Crescent-road, Crouch End.
1833		Burton,* Decimus, Esq., F.R.S. 1, Gloucester-houses, Gloucester-crescent, W.
1859	Gr. p.	Burton,* Capt. Richard Fras., H.B.M. Consul. Trieste; and Athenæum Club.
1861		Bush, Rev. Robert Wheler, M.A. 29, Milner-square, Islington, N.
1874		Bushell, Dr. Nathaniel. Bass High-school, near Bury, Lancashire.
1874	p.	Bushell, S. W., Esq., M.D. Poulton, Wingham, Kent.
1873		Busk, Capt. Hans, D.L., LL.D., F.R.S., Hon. D.C.L. Oxford. 21, Ashley-place, S.W.; and United University Club.
1868		Busk, William, Esq., M.C.P., &c. 28, Bessborough-gardens, S.W.
1861		Butler, Charles, Esq. 3, Connaught-place, Hyde-park, W.
1867		Butler, E. Dundas, Esq. Geographical Department, British Museum, W.C.
1878		Butler, Frank Hedges, Esq. Hollywood, Wimbledon-park, S.W.; and 14, New Burlington-street, W.
1878	s.	Butler, George Grey, Esq. (Civil Service Commission). Cannon-row, S.W.
1878		Butler,* Lieut.-Colonel Henry Thomas. 68, Prince's-gate, S.W.
1860		Butler, Rev. Thomas. Wilderhope-house, Shrewsbury.
1871		Butler, Major W. F. (89th Regiment). Horse Guards, S.W.
1870		Buxton, Francis W., Esq., B.A. 15, Eaton-place, S.W.
1869		Buxton, Henry Edmund, Esq., B.A. Bank-house, Great Yarmouth, Norfolk.
1873	C.	Buxton, John H., Esq. Brewery, Spitalfields, E.C.
1858		Buxton,* Sir Thomas Fowell, Bart. 14, Grosvenor-crescent, S.W.; and Warlies, Waltham-abbey, Essex.
1861		Calthorpe, The Hon. Augustus Gough. 63, Rutland-gate, S.W.
1855		Calthorpe,* F. H. Gough, Lord. 33, Grosvenor-square, W.
1854		Calvert, Frederic, Esq., Q.C. 38, Upper Grosvenor-street, W.
1871		Cama,* Dorabjee Pestronjee, Esq. 3 and 4, Winchester-street-buildings, E.C.
1861		Cameron, Donald, Esq., M.F. Auchnacarry, Inverness-shire.
1872		Cameron, Major Donald R., B.A., C.M.G. Malta. Care of Messrs. Cox & Co., Craig's-court, S.W.
1858		Cameron, Lieut.-General Sir Duncan Alexander, G.C.B.
1864	p.	Cameron, J., Esq. 32, Great St. Helen's, E.C.
1878		Cameron, Ralph Abercrombie, Esq. 3, Granville-place, Blackheath; and Junior Carlton Club, W.
1866		Cameron, R. W., Esq. Clifton, Staten Island, New York. Care of Messrs. Brooks and Co., St. Peter's-chambers, Cornhill, E.C.

Year of Election		
1876	G. P.	Cameron, Commr. Verney Lovett, R.N., C.B. <i>Shorcham-vicarage, Sevenoaks.</i>
1871		Campbell,* Allan, Esq. <i>Melbourne Club, Melbourne.</i>
1873		Campbell, C. H., Esq. <i>64 Cromwell-road, S.W.</i>
1866	C. P.	Campbell, Sir George, K.C.S.I., M.P., D.C.L. <i>13, Cornwall-gardens, South Kensington, S.W.; and Athenaeum Club, S.W.</i>
1878		Campbell, Geo. W., Esq. <i>22, Queen's-gate-gardens, S.W.</i>
1844		Campbell,* James, Esq. <i>Park-farm, Hendon, Middlesex; and 37, Seymour-street, W.</i>
1878		Campbell, James, Esq. <i>17, Queen's-gate, S.W.</i>
1857	P.	Campbell, James, Esq., Surgeon R.N. <i>The Grange, Chigwell-rou, N.E.</i>
1834		Campbell,* James, Esq., jun. <i>Cawley-priory, Chichester.</i>
1863		Campbell,* James Duncan, Esq. <i>Peking. 8, Storey's-gate, St. James's-park, S.W.</i>
1869		Campbell, Robert, Esq., J.P. <i>Buscot-park, Lechlade, Gloucestershire.</i>
1872		Campbell, Robert, Esq. <i>Lednock-bank, Comrie, Perthshire.</i>
1872		Campbell, William, Esq. <i>New Club, Glasgow.</i>
1856		Campbell-Johnston, A. R., Esq., F.R.S. <i>84, St. George's-square, S.W.</i>
1876		Campion, Frank, Esq. <i>The Mount, Duffield-road, Derby.</i>
1876		Candler, Samuel Horace, Esq. <i>25, Essex-street, Strand, W.C.</i>
1866		Canning, Sir Samuel, C.E. <i>6, Horbury-road, Notting-hill, W.</i>
1864		Cannon,* John Wm., Esq. <i>Castle-grove, Tuam.</i>
1877		Cantley, Nathaniel, Esq. <i>Botanical Gardens, Pamplemousses, Mauritius. Care of W. Coghill, Esq., Police Magistrate, Thurso, Caithness.</i>
1877		Cardi, Chas. Napoleon de, Esq. <i>78, Tower-buildings, Water-street, Liverpool.</i>
1873	C.	Cardwell,* Edward H., Esq. <i>Hillside, West Horsley, Surrey; Oxford and Cambridge and Garrick Clubs.</i>
1853		Cardwell,* Right Hon. Viscount. <i>74, Eaton-square, S.W.</i>
1863		Carew,* R. Russell, Esq., J.P. <i>Carpenders-park, Watford, Herts; and Oriental Club, W.</i>
1873		Carey, Lieutenant H. C. (late I.N.). <i>Alma-road, Southport.</i>
1879		Carey, John James, Esq. <i>Indore, Central India. Care of Messrs. H. S. King and Co., Cornhill, E.C.</i>
1869		Carey, Rev. Tupper. <i>Fifield, Bavant, Salisbury; and 15, Hyde-park-gardens, W.</i>
1872		Carfrae, John, Esq. <i>28, Norfolk-road, St. John's-wood, N.W.; and Junior Conservative Club, King-street, St. James's.</i>
1862		Cargill, John, Esq., Member of the Legislative Assembly of New Zealand, and Legislative Council of Otago. <i>Dunedin, Otago, New Zealand. Care of Messrs. Cargill, Joachim and Co., 28, Cornhill, E.C.</i>
1863		Cargill,* Wm. W., Esq. <i>Lancaster-lodge, Campden-house-road, W.</i>
1873		Carillon,* John Wilson, Esq., F.S.A., F.S.S., &c. <i>Wormhill, Buxton.</i>
1858		Carlingford, Right Hon. Lord. <i>7, Carlton-gardens, S.W.</i>
1876		Carlisle, A. D., Esq. <i>Haileybury-college, Hertford.</i>
1864		Carmichael,* Capt. L. M., M.A. (5th Lancers). <i>Athenaeum Club, Pall-mall, S.W.; and 17, West Cromwell-road, S.W.</i>



Year of Election.	
1865	Carnegie,* David, Esq. <i>Eastbury, by Watford, Herts.</i>
1863	Carnegie, Commander the Hon. J., R.N. 26, <i>Pall-mall, S.W.</i>
1874	Carnegy, Patrick, Esq. <i>Hazlewood, Upper Norwood.</i>
1876	Carr,* Wm. Ward, Esq., M.D. 6, <i>Lee-terrace, Lee, S.E.</i>
1879	Carr-Gomm, F. Culling, Esq. 10, <i>New-street, Spring-gardens, S.W.</i>
1861	Carter, Lieut.-Colonel Hugh Bonham- (Coldstream Guards). <i>Guards' Club, S.W.; and 7, Howick-place, S.W.</i>
1868	Carter, Captain Thomas Tupper, R.E. <i>Care of Messrs. H. S. King and Co., 45, Pall-mall.</i>
1873	Carter, Theodore, Esq. <i>Mapperley-house, Burnt-ash-hill, Lee, S.E.</i>
1857	Cartwright, Col. Henry (Grenadier Guards), M.P. <i>Eydon-hall, Banbury.</i>
1874	Cartwright, William, Esq. <i>Care of Office of Chinese Customs, 8, Storey's-gate, St. James's-park, S.W.</i>
1860	Carver,* Rev. Alfred J., D.D., Master of Dulwich College. <i>Dulwich, S.E.</i>
1869	Casberd-Boteler, Commr. W. J., R.N. <i>The Elms, Taplow; and Naval and Military Club, Piccadilly, W.</i>
1858	Casella, Louis P., Esq. 147, <i>Holborn-bars, E.C.; and South-grove, Highgate, N.</i>
1875	Cassels, Andrew, Esq. (Member of Council of India). 51, <i>Cleveland-square, Hyde-park, W.</i>
1874	Cassiani, Chas. Joseph, Esq. 12, <i>George-street, Portman-square, W.</i>
1877	Cates, Arthur, Esq. 7, <i>Whitehall-yard, S.W.</i>
1873	Cathcart, Major Andrew. 16, <i>Grostenor-street, W.</i>
1872	Caton, R. Redmond, Esq., F.S.A. <i>Union Club; and Binbrook-house, Market-Rasen, Lincolnshire.</i>
1872	Cattley, Edward, Esq. <i>Care of Messrs. Ropes and Co., 5, Jeffreys-square, St. Mary-Axe, E.C.; and St. Petersburg.</i>
1879	Caudwell,* J., Esq. <i>Spencer-park, Wandsworth-common, S.W.</i>
1860	Cave, Amos, Esq. <i>Grove-house, Cromwell-road, Brixton-rise, Surrey.</i>
1876	Cave, Colonel Edward. <i>East India United Service Club, 14, St. James's-square, S.W.</i>
1857	Cave, Captain Laurence Trent. 13, <i>Lowndes-square, S.W.</i>
1858	Cave, Right Hon. Stephen, M.P. 35, <i>Wilton-place, S.W.</i>
1874	Cave-Browne, Rev. J. <i>Detling-vicarage, Maidstone.</i>
1869	p. Cayley, Dr. Henry. 3, <i>All Saints'-road, Clifton, Bristol.</i>
1873	Chadwick, Jesse, Esq. <i>London-road, Derby.</i>
1874	Chadwick, Jno. O., Esq. 46, <i>Bolton-road, St. John's-wood, N.W.</i>
1863	Challis, John Henry, Esq. <i>Reform Club, S.W.</i>
1871	Chalmer,* Capt. Reginald (60th Royal Rifles). <i>Peshawur, East Indies.</i>
1874	Champsain, Major J. U. Bateman, R.E. <i>Chisholm-lodge, Queen's-road, Richmond.</i>
1858	Champion, John Francis, Esq. <i>High-street, Shrewsbury.</i>
1876	Champney, Chas. E., Esq. <i>Bank Field, Halifax.</i>
1866	Chandlee,* William, Esq. 5, <i>Portman-street, Oxford-street, W.</i>
1875	Chapelle, Count de la.

Year of Election.		
1870		Chapman, Capt. E. F., R.A. <i>Fairholme, Wimbledon, S.W.</i>
1863		Chapman,* Spencer, Esq. <i>Roehampton, S.W.</i>
1861		Charnock, Richard Stephen, Esq., PH.D., F.S.A. <i>Junior Garrick Club, Adelphi-terrace, W.C.</i>
1875		Chater, Geo., junr., Esq. 41, <i>Porchester-square, Hyde-park, W.</i>
1872		Chatwood, Samuel, Esq. 5, <i>Wentworth-place, Bolton.</i>
1873		Chauntrell, Fred Dundas, Esq. 63, <i>Lincoln's-inn-fields, W.C.</i>
1876		Chauvin, George von, Esq. 6, <i>Half-Moon-street, W.</i>
1864	P.	Cheadle, Walter B., Esq., B.A., M.D. Camb. 2, <i>Hyde-park-place, Cumberland-gate, W.</i>
1873		Cheetham, Samuel, Esq. 11, <i>Rumford-place, Liverpool.</i>
1855		Cheshire, Edward, Esq. 3, <i>Vanbrugh-park, Blackheath, S.E.; and Conservative Club, S.W.</i>
1859		Chetwode, Augustus L., Esq. 3, <i>Charles-street, Lowndes-square, S.W.; and Chilton-house, Thame, Oxfordshire.</i>
1876		Cheyne, Captain Jno. P., R.N.
1870		Chichester, Sir Bruce, Bart. <i>Arlington-court, Barnstable.</i>
1858		Childers, Right Hon. Hugh C. E., M.P. 17, <i>Prince's-gardens, S.W.</i>
1856		Childers, John Walbanke, Esq. <i>Cantley-hall, near Doncaster.</i>
1878		Childs, Capt. Geo. Coulson (Acting Col. Secy., Accra). 11, <i>Finsbury-place South, E.C.</i>
1857	P.	Chimmo,* Captain William, R.N. <i>Westdowne, Weymouth.</i>
1869		Chinnock, Frederick George, Esq. 86, <i>Cornwall-gardens, Queen's-gate, S.W.</i>
1874		Cholmley,* Harry Walter, Esq. <i>Hovsham, near York.</i>
1877		Christie, Edward Richard, Esq.
1872		Christie, James Alexander, Esq. <i>Flushing, Falmouth.</i>
1872		Christie, T. Beath, Esq., M.D. <i>Ealing.</i>
1878		Church, Capt. Edw. John, R.N. <i>Royal Naval College, Greenwich.</i>
1871		Church, Colonel Geo. Earl. 19, <i>Great Winchester-street, E.C.</i>
1830		Church,* W. H., Esq.
1849	C.	Churchill, Lord Alfred Spencer. 16, <i>Rutland-gate, S.W.</i>
1856		Churchill, Charles, Esq. <i>Weybridge-park, Surrey.</i>
1870		Clapton, Edward, Esq., M.D., &c. <i>St. Thomas's-street, Southwark, S.E.</i>
1863		Clark, Lieut. Alex. J. 33, <i>Springfield-road, St. John's-wood, N.W.; and 14, St. James's-square, S.W.</i>
1870		Clark, Charles, Esq. 20, <i>Belmont-park, Lee, Kent, S.E.</i>
1872		Clark, George Thomas, Esq. <i>Douglas-house, Doulaia.</i>
1873		Clark, Sir John, Bart. <i>Tullypronie, Turland, Aberdeenshire.</i>
1868		Clark, John Gilchrist, Esq. <i>Speddock, Dumfries, Dumfriesshire.</i>
1862		Clark, J. Latimer, Esq. 5, <i>Westminster-chambers, Victoria-street, S.W.; and Beechmont, Dulwich, S.E.</i>
1879		Clark, Mateo, Esq. <i>Cave of Francisco Torrome, Esq., 4, Jeffreys-square, St. Mary-axe, E.C.</i>
1874		Clark,* Mathew E., Esq. 18, <i>Granville-place, Portman-square, W.</i>



Year of Election.		
1870		Clark, Robert, Esq. 46, <i>Chepstow-villas, Bayswater, W.</i>
1878		Clark, Stephen, Esq. 1, <i>Lavender-villa, Wood-street, Barnet.</i>
1868		Clark, William, Esq.
1865		Clark, W. H., Esq. 6, <i>Leinster-terrace, Hyde-park, W.</i>
1874		Clark-Kennedy,* Capt. Alexander W. M., F.Z.S. (late Coldstream Guards). 10, <i>Eglinton-terrace, Portrush, Ireland; and Guards' Club, Pall-mall, S.W.</i>
1875		Clarke, Archibald Hy., Esq. <i>South-hill, Paignton, Devon.</i>
1859		Clarke, Col. Sir A., B.E. <i>Army and Navy Club, S.W.</i>
1874	P.	Clarke, Major F. C. H., B.A. <i>Adair-house, St. James's-square, S.W.</i>
1872		Clarke, Joseph, Esq. <i>North-hill-villa, Highgate, N.</i>
1868		Clarke, W., Esq. 44, <i>Ladbroke-grove, W.</i>
1862		Claude, F. Eugène, Esq. <i>Alpina-house, Tufnell-park, N.</i>
1863		Clayton, Captain John W. (late 15th Hussars). 14, <i>Portman-square, W.</i>
1866		Cleghorn,* Hugh, Esq., M.D. <i>Stravithy, St. Andrew's.</i>
1871	P.	Cleghorn, John, Esq., M.A., M.S.A., &c. 3, <i>Spring-gardens, S.W.</i>
1879		Clement, Major Reynold Alleyne. <i>Datchet, Bucks.</i>
1863		Clements, Rev. H. G. <i>Vicarage, Sidmouth; and United University Club, S.W.</i>
1870		Clements, Robert George, Esq. 97, <i>Victoria-park-road, E.</i>
1860	P.	Clerk, Captain Claude. <i>Hyderabad, E. Indies.</i>
1858		Clermont, Thomas, Lord. 35, <i>Hill-street, Berkeley-square, W.; and Ravensdale-park, Newry.</i>
1845		Cleveland,* His Grace the Duke of. <i>Cleveland-house, 17, St. James's-square, S.W.</i>
1861		Clifford, Sir Charles. <i>Hatherton-hall, Cannock, Staffordshire.</i>
1858		Clifford, Charles Cavendish, Esq. <i>House of Lords, S.W.</i>
1871		Clifford, Henry, Esq., C.E. 1, <i>Lansdown-place, Blackheath, S.E.</i>
1866		Clinton, Lord Edward. <i>Army and Navy Club, S.W.</i>
1875		Clirehugh, W. P., Esq. 14, <i>Ladbroke-terrace, Notting-hill.</i>
1879		Clive, Colonel Edward H. (Grenadier Guards). 15, <i>Ennismore-gardens, Prince's-gate, S.W.</i>
1863		Clowes, E., Esq. <i>Salisbury-square, Fleet-street, E.C.</i>
1874		Clowes, Capt. Frederic (30th Regiment). 51, <i>Gloucester-terrace, Hyde-park, W.</i>
1854		Clowes, George, Esq. <i>Duke-street, Stamford-street, S.E.; Charing-cross, S.W.; and Surbiton, Surrey.</i>
1854		Clowes, William, Esq. 51, <i>Gloucester-terrace, Hyde-park, W.</i>
1861		Clowes, William Charles Knight, Esq., M.A. <i>Duke-street, Stamford-street, S.E.; and Surbiton, Surrey.</i>
1874		Clutterbuck, Robert, Esq., J.P. 8, <i>Great Cumberland-place, W.</i>
1874		Coard, Philip Aldridge, Esq. 13, <i>St. Mark's-square, Sandringham-road, West Hackney, E.</i>
1877		Coate, James, Esq. 41 and 42, <i>Lisle-street, Leicester-square, W.C.; and Chard, Somersetshire.</i>
1875		Coates, Edmund, Esq. 8, <i>Baker-street, Portman-square, W.</i>
1877		Coates, Walter S., Esq. 2, <i>Malvern-villas, Belgrave-road, Bath.</i>
1875		Cobb, Jas. Francis, Esq. <i>The Brake, Torquay, Devon.</i>

Year of Election.	
1852	Cobbold, John Chevalier, Esq. <i>Athenæum Club, S.W.; and Ipswich, Suffolk.</i>
1859	Cochrane, Rear-Admiral the Hon. A., C.B. <i>Junior United Service Club, S.W.</i>
1873	Cochrane,* Kenneth, Esq. <i>Elmbank, Galashiels, N.B.</i>
1868	Cock, Edward, Esq. <i>Kingston-on-Thames.</i>
1869	Cockburn,* Major James George (6th Regiment). <i>Bracondale, Norwich</i>
1877	Cockburn, J. P., Esq. <i>The Mount, Totnes, South Devon.</i>
1862	Cockerton, Richard, Esq. <i>Cornwall-gardens, South Kensington, S.W.</i>
1862	Cockle,* Captain George. 9, <i>Bolton-gardens, South Kensington, S.W.</i>
1876	Cocks,* Alf. Henenge, Esq. 42, <i>Great Cumberland-place, Hyde-park, W.</i>
1859	Cocks, Colonel C. Lygon (Coldstream Guards). <i>Treverbyn-Vean, Liskeard, Cornwall.</i>
1865	Cocks, Major Octavius Yorke. 86, <i>Park-street, Grosvenor-square, W.</i>
1841	C. Cocks,* Reginald Thistlethwayte, Esq. 43, <i>Charing-cross, S.W.; and 29, Stanhope-gardens, South Kensington, S.W.</i>
1876	Cocks,* Thos. S. Vernon, Esq. 43, <i>Charing-cross, S.W.</i>
1871	Cockshott,* Arthur, Esq., M.A. <i>Eton College.</i>
1873	Codrington, General Sir William, G.C.B. 110, <i>Eaton-square, S.W.</i>
1872	Coe,* Rev. C. C. <i>Highfield, Bolton-le-Moors.</i>
1857	Coghlan, Edward, Esq. <i>Training-institution, Gray's-inn-road, W.C.</i>
1861	Coghlan, J., Esq. (Engr.-in-Chief to the Government, Buenos Ayres). <i>Care of H. C. Forde, Esq., 6, Duke-street, Adelphi, W.C.</i>
1876	Coghlan,* Nav. Lieut. Jas. E., R.N. <i>Care of Hydrographic-office, Admiralty, S.W.</i>
1865	Colchester, Reginald Charles Edward, Lord. 7, <i>Cromwell-road, S.W.</i>
1879	Cole, Alfred Clayton, Esq. 64, <i>Portland-place, W.</i>
1875	Cole, Geo. Ralph Fitz-Roy, Esq. <i>Queen Anne's-mansion, Westminster, S.W.; Wanderers' and South American Clubs, S.W.</i>
1868	Cole, William H., Esq. 64, <i>Portland-place, W.</i>
1876	Cole, Wm. Hammond, Esq. <i>Great Plumstead, near Norwich, Norfolk.</i>
1867	Colebrook, John, Esq. 17, <i>Walton-place, Chelsea, S.W.</i>
1841	Colebrooke,* Sir Thomas Edward, Bart., F.R.A.S. 37, <i>South-street, Park-lane, W.</i>
1854	Coleman, Everard Home, Esq., F.R.A.S. <i>Registry and Record Office, 82, Basinghall-street, E.C.</i>
1848	Coles, Charles, Esq. 86, <i>Great Tower-street, E.C.*</i>
1876	Coles, James, Esq. 26, <i>Malvern-road, Beeston-hill, Leeds.</i>
1873	Coles, Jno., Esq. <i>Mitcham, Surrey.</i>
1835	Collett,* William Rickford, Esq. <i>Carlton Club, S.W.</i>
1872	Collingwood, Lieut. W. <i>India-office, S.W.</i>
1878	Collins, Wm., Esq. 3, <i>Park-terrace East, Glasgow.</i>
1866	P. Collinson, John, Esq., C.E. 37, <i>Porchester-terrace, Hyde-park, W.</i>
1855	Gr. C. p. Collinson, Vice-Admiral Sir Richard, K.C.B. <i>Havna-lodge, Ealing, W.; and United Service Club, S.W.</i>
1871	Collis,* Capt. Gustavus W. Berry (6th Royal Regiment). <i>Care of Mrs. Collis, Barton-terrace, Dawlish, Devon.</i>



Year of Election.		
1878		Colomb, Captain J. C. R. <i>Drounquinna, Kenmare, Co. Kerry; and Junior United Service Club, S.W.</i>
1862		Colquhoun, Sir Patrick M. de, Q.C., LL.D. 2, <i>King's-Bench-walk, Temple, E.C.</i>
1869	P.	Colvill, Surg.-Major William H., Ind. Army. 50, <i>Torrington-square, W.</i>
1861		Colville,* Right Hon. Lord. 42, <i>Eaton-place, S.W.</i>
1865		Colvin, Binny J., Esq. 17, <i>Elcavon-place, Queen's-gate, S.W.</i>
1868		Colvin, Captain W. B. (Royal Fusiliers).
1868		Combe, Lieut. B. A.
1871		Comber, Colonel A. K. (Dep.-Commissioner of Assam, Goalpara). <i>Care of Messrs. Woodhead and Co., 44, Charing-cross, S.W.</i>
1879	P.	Comber,* Rev. T. J. <i>Care of A. H. Baynes, Esq., 19, Castle-street, Holborn, E.C.</i>
1864		Commerell, Admiral Sir J. E., V.C., K.C.B. <i>Alverbank, Alcester, Hants.</i>
1876		Congreve, Chas. R., Esq. <i>Care of R. J. Congreve, Esq., Carluccark, Castle-Douglas, N. B.</i>
1876		Conlan, Geo. Nugent, Esq. <i>Tivoli-house, Kingstown, Co. Dublin.</i>
1878		Coode, Sir John, Knt., C.E. 35, <i>Norfolk-square, Hyde-park, W.</i>
1872		Cook,* F. L., Esq. 24, <i>Hyde-park-gardens, W.</i>
1868	P.	Cook, H., Esq., M.D., &c. <i>Care of Messrs. Forbes and Co., 12, Leadenhall-street, E.C.</i>
1859		Cooke, Lieut.-Col. A. C., R.E. <i>Bermuda.</i>
1863		Cooke,* E. W., Esq., A.R.A., F.R.S., F.L.S., F.Z.S., F.G.S., Accad. Bell. Art. Venet. et Holm. Socius. <i>Glen-Andred, Groombridge, Sussex; and Athenaeum Club, S.W.</i>
1856		Cooke, John George, Esq.
1852		Cooke, Robt. F., Esq. 50, <i>Albemarle-street, W.</i>
1860		Cooke, William Henry, Esq., Q.C. 42, <i>Wimpole-street, W.</i>
1874		Cooke, Capt. W. S. (22nd Regiment). <i>Malta.</i>
1872		Cookson,* F., Esq. 39, <i>Cannon-place, Brighton.</i>
1830	P.	Cooley, William Desborough, Esq. 13, <i>College-place, Camden-town, N.W.</i>
1876		Cooling, Edwin, Esq. <i>Mile Ash, Derby.</i>
1875		Coombe, Edward, Esq. 25, <i>The Terrace, Greenhithe, Kent.</i>
1872		Cooper, Alfred, Esq. 9, <i>Henrietta-street, Cavendish-square, W.</i>
1872		Cooper, Commr. B. J., R.N.
1877		Cooper, Charles E., Esq. <i>Observatory-house, Kingsdown, Bristol.</i>
1862		Cooper, Sir Daniel. 6, <i>De Vere-gardens, Kensington-palace, W.</i>
1856		Cooper, Lieut.-Col. Edward H. (Grenadier Guards). 42, <i>Portman-square, W.</i>
1860		Cooper, Lieut.-Col. Joshua H. (7th Fusiliers). <i>Dunboden, Mullingar.</i>
1878	*	Cooper, Percy H., Esq. <i>Bullwell-hall, Nottingham.</i>
1874		Cooper, William White, Esq. 19, <i>Berkeley-square, W.</i>
1876		Coote, Algernon C. P., Esq., M.A. <i>The Priory, Tunbridge Wells.</i>
1837		Coote,* Vice-Admiral Robert, C.B. " <i>Shales</i> ," <i>Bitterne, Southampton.</i>
1878		Copland-Crawford, Fitzgerald Hamilton, Esq. <i>Sudbury-lodge, Harrow.</i>
1874		Copland-Crawford, General R. F., R.A., F.G.S. <i>Sudbury-lodge, Harrow, Middlesex.</i>

Year of  
Election.

- 1853 Copley, Sir Joseph William, Bart. *Travellers' Club, Pall-mall, S.W.*
- 1868 Cork, Nathaniel, Esq. *Grennel-house, Sutton, Surrey.*
- 1868 Corner, William Mead, Esq. "*Sunnyside*," 16, *Longton-grove, Upper Sydenham.*
- 1860 Cornwell, James, Esq., PH.D. *Purbrook, Crescent-wood-road, Sydenham-hill, S.E.*
- 1877 Corscaden, John F., Esq. 24, *Holland-park, W.*
- 1868 Cory, Frederic C., Esq., M.D. *Portland-villa, Duckhurst-hill, Essex; and Nassau-place, Commercial-road, E.*
- 1873 Cosson, Capt. Emilius Albert de. *Pycroft-house, Chertsey, Surrey.*
- 1874 Cosson,\* Baron de. *Pycroft-house, Chertsey, Surrey; and 38, Rue St. Dominique, St. Germain, Paris.*
- 1869 Coster, Guillaume F., Esq. 11, *Park-crescent, Regent's-park, N.W.*
- 1853 Cosway,\* William Halliday, Esq.
- 1875 Cotesworth, Wm., Esq. *Cowdenknoves, Roxburghshire, N.B.*
- 1876 Cotterill, Rev. G. E. 5, *Arlington-villas, Brighton.*
- 1875 p. Cotterill, H. B., Esq., B.A. 1, *Athol-place, Edinburgh.*
- 1856 C. Cottesloe, Right Hon. Lord. 20, *Eaton-place, S.W.; and Swanbourne, Winslow, Buckinghamshire.*
- 1873 Cottrill, Robert Alfred, Esq. *Spelthorne-grove, Sunbury, Middlesex.*
- 1877 Couch, Right Hon. Sir Richard, Knt. 25, *Linden-gardens, Baymeater-road, W.*
- 1873 Courtenay, J. Irving, Esq. 3, *Ploeden-buildings, Temple, E.C.*
- 1874 Courtney,\* Henry Nicholas, Esq., B.A. 2, *Little Stanhope-street, Mayfair, W.; and National Club, Whitehall-gardens, S.W.*
- 1875 Covington, Rev. W., Vicar of St. Luke's. *The Vicarage, Brompton, S.W.*
- 1875 Coward, Dr. John W. S. *Care of Messrs. Hollams, Son and Coward, Mincing-lane, E.C.*
- 1862 Coward, William, Esq. 41, *Pen-y-yeorn-road, S. Kensington, S.W.*
- 1857 Cowell,\* Lieut.-Col. Sir J. C., R.E., K.C.B. *Buckingham-palace, S.W.*
- 1854 Cowley, Norman, Esq. 4, *Montagu-place, Montagu-square, W.*
- 1871 Cowper, Henry Aug. (H.M. Com. Puerto Rico). *Care of Messrs. Woodhead and Co., 44, Charing-cross, S.W.*
- 1878 Cox, James, Esq. *Grange-house Academy, Leominster, Herefordshire.*
- 1874 Coxon, Samuel Bailey, Esq., F.G.S. *Usworth-hall, Durham.*
- 1865 Coysh, John S., Esq.
- 1870 Cracroft,\* Bernard, Esq., M.A. Trin. Coll. Camb. *Oxford and Cambridge Club, S.W.; and 1, Stanford-row, South Kensington, S.W.*
- 1875 Cragoe,\* Thos. Adolphus, Esq. *Woodbury-villa, Truro.*
- 1867 Crane, Leonard, Esq., M.D. 7, *Albemarle-street, W.*
- 1877 Crane, T. H., Esq. *San-house, London-road, Yeovil, Somerset.*
- 1873 Craufurd, George Ponsonby, Esq. *Buenos Ayres; and Travellers' Club, S.W.*
- 1857 Craufurd, Lieut.-General James Robertson (Grenadier Guards). *Travellers' Club, S.W.; and 36, Prince's-gardens, S.W.*
- 1875 Craven, Alfred, Esq. *Brookfield-house, Folkestone.*
- 1848 C. Crawford, Robert Wigram, Esq. 11, *Warwick-square, S.W.*



Year of Election.	
1879	Crawley, Wm. John Chetwode, Esq., LL.B., F.G.S., &c. 3, <i>Ely-place, Dublin.</i>
1873	Creswell, Alf. Aug., Esq. 1, <i>Capel-court, E.C.; and Radford-ticarage, Notts.</i>
1861	Creswell, Rev. Samuel Francis, D.D., F.R.A.S. <i>Northrepps-rectory, Norwich.</i>
1859	Creyke,* Captain Richard Boynton, R.N. <i>Granthorpe-hall, Fife, Yorkshire.</i>
1877	Crispe, James, Esq. <i>Leatherhead.</i>
1856	Crocker, T. F. Dillon, Esq. 19, <i>Pelham-place, Brompton, S.W.</i>
1864	Croll, Col. A. A., C.E., F.G.S., Netherlands. <i>Granard-lodge, Rochampton.</i>
1868	Croll, Alex., Esq. <i>Mavis-bank, Grange-road, Upper Norwood.</i>
1860	Croskey,* J. Rodney, Esq. 31, <i>St. Mary's-terrace, Paddington, W.</i>
1877	Crosse, Captain Arthur T. (52nd Regiment). <i>Aldershot.</i>
1862	Crossman, James Hiscutt, Esq. 31, <i>Curzon-street, Mayfair, W.</i>
1875	Crossman, Lieut.-Colonel W., R.E., C.M.G. 30, <i>Harcourt-terrace, Redcliffe-square, S.W.</i>
1879	Crothers, Wm. Edmund, Esq. 47, <i>Victoria-street, Belfast; and Botanic-acres, Belfast.</i>
1863	Crowder,* Thos. Mosley, Esq., M.A. <i>Corpus Christi College, Oxford.</i>
1874	Crowe, Francis, Esq., LL.D. 22, <i>Westbourne-park-road, W.</i>
1872	Cruikshank, Donald, Esq. <i>Junior Naval and Military Club, Pall-mall, S.W.</i>
1859	Cull, Richard, Esq., F.S.A. 12, <i>Tavistock-street, Bedford-square, W.C.</i>
1874	Cumming, Chas. Lennor B., Esq. (Madras Civil Service). 34, <i>Westbourne-park-road, Bayswater, W.</i>
1857	Cumming, William Fullarton, Esq., M.D. <i>Athenaeum Club, S.W.; and Kinelam, Edinburgh.</i>
1877	Cunha, J. Gerson da, Esq., M.D. <i>Royal Asiatic Society, Bombay.</i>
1860	Cunliffe, Roger, Esq. 10, <i>Queen's-gate, S.W.</i>
1853	Cunningham, John Wm., Esq., Sec. King's College. <i>Somerset-house, W.C.; and Harrow.</i>
1862	Cunynghame,* Gen. Sir A. T., G.C.B. 10, <i>Eaton-terrace, Eaton-square, S.W.</i>
1865	Cure, Capel, Esq. 51, <i>Grosvenor-street, W.</i>
1872	Curling, Rev. J. Jas. <i>Care of Sir Bryan Robinson, 9, Gordon-place, Campden-hill, Kensington, W.</i>
1868	Currie, A. A. Hay, Esq., C.E. (H.M. Vice-Consul, Nice). 25, <i>Thurloe-road, Hampstead, N.W.</i>
1877	Currie, Donald, Esq., C.M.G. 13, <i>Hyde-park-place, W.</i>
1877	Currie, Raikes, Esq. <i>Minley, Hampshire.</i>
1843	Cursetjee,* Manockjee, Esq., F.R.S.N.A. <i>Villa-Byculla, Bombay.</i>
1839	Curtis,* Timothy, Esq.
1872	Cust, Robt. Needham, Esq. 64, <i>St. George's-square, S.W.</i>
1867	Cuttance, John Fras. J., Esq. <i>Cleveland-house, Grosville-road, Kilburn, N.W.</i>
1872	Czarnikow, Caesar, Esq. 29, <i>Mincing-lane, E.C.</i>

Year of Election.		
1874		Dadson, Arthur Jas., Esq.
• 1883		Dalgely,* Fred. G., Esq. 16, <i>Hyde-park-terrace, W.</i>
1866		Dalhousie,* Right Hon. Earl of. <i>Coulstoun-house, Mid-Lothian.</i>
1870		Dallas, Sir Geo. E., Bart. <i>Foreign-office, Downing-street, S.W.</i>
1865	P.	D'Almeida, W. B., Esq. 19, <i>Green-park, Bath.</i>
1857		Dalton, D. Foster Grant, Esq. <i>Shanks-house, near Wincanton, Somerset.</i>
1879		Dalton, Major-General Edw. T., C.S.I. <i>Queen Anne's-mansions, S.W.</i>
1873		Daly, Chief Justice Chas. P., LL.D. (President of the American Geographical Society, New York). 84, <i>Clinton-place, New York.</i>
1859	P.	Dalyell, Sir Robt. Alex. Osborn, Bart. <i>Travellers' Club, Pall-mall, S.W.</i>
1871		Daniell,* Colonel E. Staines. <i>Hamilton-house, Odiham, Hampshire; and East India United Service Club, 14, St. James's-square, S.W.</i>
1878		Danson, William, Esq. 2, <i>Eton-road, Haverstock-hill, N.W.</i>
1877		Darbishire, Godfrey, Esq. <i>Victoria-park, Manchester.</i>
1874		Darroch, Geo. Edw., Esq. 40, <i>Stanhope-gardens, S.W.; and Oxford and Cambridge Club, Pall-mall, S.W.</i>
1838	C. P.	Darwin,* Charles, Esq., M.A., F.R.S. <i>Down, Beckenham, Kent.</i>
1877		Davenport, Samuel, Esq. <i>Care of H. D. Davenport, Esq., 48, St. James's-street, S.W.; and Beaumont, near Adelaide, S.A.</i>
1879		Davies, Rev. Edw. Aug. <i>Shady-tree-house, Middleton, Lancashire.</i>
1863		Davies, Sir R. H., K.C.S.I., Chief Commissioner of Oudh, Lucknow. <i>Care of Messrs. Twining, 215, Strand, W.C.</i>
1873		Davies, Rev. R. V. Faithfull. <i>Trinity-college, Eastbourne.</i>
1869		Davies,* Robert E., Esq., J.P. <i>Cosham-house, East Cosham, Hants.</i>
1873		Davies, W. Hy. Esq. 51, <i>Tregunter-road, South Kensington, S.W.</i>
1866		Davis, Edmund F., Esq. 6, <i>Cork-street, Bond-street, W.</i>
1866		Davis, Frederick E., Esq. 20, <i>Blandford-square, N.W.</i>
1875		Davis, Commr. Hugh, R.N. <i>Army and Navy Club, Pall-mall.</i>
1877		Davis, Israel, Esq., M.A. 6, <i>King's-Bench-walk, Temple, E.C.</i>
1874		Davis, Rev. James. 21, <i>Brondesbury-road, Kilburn, N.W.</i>
1846	P.	Davis, Sir John Francis, Bart., K.C.B., F.R.S., F.R.S.N.A. <i>Athenæum Club, S.W.; and Hollywood, near Bristol.</i>
1874		Dawes, Edwyn, Esq. <i>Heathfield-lodge, Surbiton.</i>
1875		Dawney,* The Hon. Guy C. 8, <i>Belgrave-square, S.W.; and Bookham-grove, Leatherhead.</i>
1840		Dawney,* The Hon. Payan. <i>Beningborough-hall, Newton-upon-Ouse, Yorkshire.</i>
1879		Dawson, Lieut. Llewellyn S., R.N. <i>Hydrographic-office, Admiralty, S.W.</i>
1877		Day, Frederick, Esq. <i>South Molton, North Devon.</i>
1875		Daymond, Rev. Charles, M.A., Principal of St. Peter's College, <i>Peterborough.</i>
1877		Dean, F. J., Esq.
1879		Deane, Lieut.-Colonel Bonar. 7, <i>Gloucester-terrace, Campden-hill.</i>
1878		Deane, Jno. Richd., Esq. <i>Care of Messrs. H. S. King and Co., Pall-mall, S.W.</i>
1865		Debary, Rev. Thomas, M.A. <i>Athenæum Club, Pall-mall, S.W.</i>
1866		Debenham, William, Esq. 41, <i>Grove-end-road, St. John's-wood, N.W.</i>



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Election.

- 1875 De Blaquiére, Capt. Lord, R.N. *Scientific Club, 7, Savile-row, W.; and Springfield, Crawley, Sussex.*
- 1876 De Crespigny, Aug. C., Esq. *London and County Club, Langham-place, W.*
- 1856 P. De Crespigny, Lieut. C., R.N. *Care of Messrs. King and Co., 65, Cornhill, E.C.*
- 1876 Dekeyser, \* P., Esq. *Chatham-house, Grove-road, Clapham-park.*
- 1865 De Laski, \* A., Esq. 2, *Adelaide-crescent, Brighton.*
- 1869 De Leon, Dr. Hananel. 26, *Redcliffe-gardens, West Brompton, S.W.*
- 1862 P. Deaham, Vice-Adm. Sir Henry Mangles, F.R.S. 21, *Carlton-road, Maida-vale, W.*
- 1860 Denison, Alfred, Esq. 6, *Albemarle-street, W.*
- 1876 Denman, Hon. Geo. 11, *Palace-gate, Kensington, W.*
- 1875 Denny, \* Edward Maynard, Esq. 55, *Manchester-street, W.*
- 1876 Denny, Thos. Anthony, Esq. 7, *Connaught-place, W.; and Budingwood, Horsham.*
- 1875 Dennys, N. B., Esq., PH.D. *Hong Kong.*
- 1872 Dent, \* Alfred, Esq. 29, *Chesham-street, S.W.*
- 1874 Dent, Clinton T., Esq. 29, *Chesham-street, S.W.*
- 1872 Dent, \* Edward, Esq. *Fernacres, Falmer, near Slough, Bucks.*
- 1871 Dentry, James, Esq. *The College, Margate.*
- 1853 C. Derby, \* Right Hon. Edward Henry, Earl of, P.C., LL.D., D.C.L. 23, *St. James's-square, S.W.; and Knowlesley-park, Prescott, Lancashire.*
- 1877 Derry, Frederick, Esq. 31, *Upper Hockley-street, Birmingham.*
- 1875 De Ricci, Jas. H., Esq. 2, *Tanfield-chambers, Temple, E.C.*
- 1867 De Salis, Lieut.-Gen. Rodolph, C.B. 27, *Ashley-place, Victoria-street, S.W.*
- 1875 De Salis, Wm. Fane, Esq. *Danley-court, Uxbridge.*
- 1872 Desmond, Rev. H. M. Egan. 31, *Belaize-park, N.W.; and London and Westminster Bank, 1, St. James's-square.*
- 1874 Devas, Thomas, Esq. *Mount Ararat, Wimbledon.*
- 1874 Devereux, W. Cope, Esq., R.N. *The Anchorage, Chislehurst.*
- 1877 De Vitre, Rev. George, M.A. *Keep Hatch, Wokingham, Berks.*
- 1837 Devonshire, \* His Grace the Duke of, K.G., LL.D., D.C.L., F.R.S. *Devonshire-house, Piccadilly, W.; and Harcheiche-hall, Derbyshire.*
- 1853 De Wesselow, Lieut. Fras. G. Simpkinson. 67, *Victoria-street, S.W.*
- 1877 Dewdney, George, Esq., B.A. *Belle-vue, Chepstow.*
- 1872 Dhuleep-Singh, His Highness the Maharaja. *Elvedon-hall, near Thetford.*
- 1870 Dibdin, Charles, Esq. 62, *Torrington-square, W.C.*
- 1870 Dibdin, Robert W., Esq. 62, *Torrington-square, W.C.*
- 1862 Dick, Captain Charles Cramond. *Bayford-grange, Hertford.*
- 1866 Dick, \* Fitzwilliam, Esq., M.P. 20, *Curzon-street, Mayfair, W.*
- 1861 Dick, Robert Kerr, Esq. (Bengal Civil Service). *Oriental Club, W.*
- 1830 Dickinson, \* Francis Henry, Esq., F.S.A. 119, *St. George's-square, Pinlicko, S.W.; and Kingweston-park, Somerset.*
- 1877 Dickinson, Thomas B., Esq. 19, *Chesham-road, Brighton.*
- 1859 Dickson, A. Benson, Esq. 4, *New-square, Lincoln's-inn, W.C.*
- 1877 Dickson, John, Esq. *Beyrout. Care of G. C. Shaw, Esq., Union Bank of London, 2, Princes-street, E.C.*

Year of  
Election.

- 1875 Dickson,\* Oscar, Esq. *Stockholm. Care of Messrs. Dickson Bros., 6, Moorgate-street, E.C.*
- 1860 Dietz, Bernard, Esq., of Algoa Bay. 3, Dorset-square, W.
- 1859 Digby, G. Wingfield, Esq. *Sherborne-castle, Dorset.*
- 1860 Digby, Lieut.-Colonel John Almerous. *Chalmington-house, Cattstock, Dorchester.*
- 1859 Dilke,\* Sir Charles Wentworth, Bart., M.P. 76, *Sloane-street, S.W.*
- 1856 Dillon, The Hon. Arthur. 113, *Victoria-street, S.W.*
- 1879 Dimmer, Augustus Henry, Esq. *Ormonde-house, Ryde, Isle of Wight.*
- 1873 Dineen, Thomas, Esq. 17, *Queen-street, Leeds, Yorkshire.*
- 1872 Divett, Edwd. Ross, Esq. *Reform Club, S.W.*
- 1878 Dixon,\* James, Esq., Jun. *Kingswood, Clapham-park; and 81, Gracechurch-street, E.C.*
- 1872 Dixon, Joseph, Esq. *Hillsbro'-hall, Sheffield.*
- 1854 Dixon,\* W. Hepworth, Esq., F.S.A. 6, *St. James's-terrace, St. John's-wood, N.W.*
- 1877 Dobson, George, Esq. *Oakfield, Romilly-road, Cardiff.*
- 1873 Dodd, Jno., Esq. *Tamsui, Formosa.*
- 1876 Dodson,\* Geo. Edward, Esq. *Ravensknockle, Anerley, S.E.*
- 1854 Dodson, Right Hon. John George, M.P. 6, *Seamore-place, Mayfair, W.*
- 1876 Doran, Colonel John, C.B. *Percy-house, Leyland-road, Lee.*
- 1870 Dorchester, Dudley Wm. Carleton, Lord. 42, *Berkeley-square, W.*
- 1876 Dore, Henry J., Esq. 38, *Bruton-street, W.*
- 1873 Doria, Marchese Giacomo. *Genoa. Care of Messrs. Kirkland, Cope, and Co., 23, Salisbury-street, Strand, W.C.*
- 1868 Douglas, John, Esq.
- 1868 Douglas, Captain Neil D. Cecil F. 1, *Morpeth-terrace, Victoria-street, S.W.; and Guards' Club, S.W.*
- 1875 Douglas, Lieut.-General Sir Percy, Bart. *Henlade-house, Taunton, Somerset.*
- 1871 Douglas, Stewart, Esq. *Oriental Club, W.*
- 1879 Douglas,\* W. D. R., Esq. *Orchardton, Castle Douglas, N.B.*
- 1879 Douglas, William, Esq., M.D. *Care of James Ogston, Esq., Messrs. D. and C. McIver's, 8, Water-street, Liverpool.*
- 1874 Dowling, Edward Samuel, Esq. 14, *Holland-villas-road, Kensington, W.*
- 1871 Down, J. H. Langdon, Esq., M.D. 39, *Welbeck-street, W.; and Normansfield, Hampton Wick.*
- 1878 Downer, Richard Clarke, Esq. *Falcon-house, Gough-square, E.C.*
- 1879 Dowson,\* Philip Septimus, Esq. *Cardiff, South Wales.*
- 1853 Doyle, Sir Francis Hastings C., Bart. *Custom-house, E.C.*
- 1872 Drew,\* Frederic, Esq. *Eton College, Windsor.*
- 1878 Druitt, Thos. Wyard, Esq. 66, *Charing-cross, S.W.*
- 1869 Drummond,\* Captain Alfred Manners. *Army and Navy Club, S.W.*
- 1865 Drummond, E. A., Esq. *Cadlands, near Southampton.*
- 1846 Drury, Vice-Admiral Byron. 4, *Cambridge-villas, Cheltenham.*
- 1877 Dryland, William, Esq. 38, *Brook-street, Grosvenor-square, W.*



Year of Election.		
1851		Du Cane,* Major Francis, R.E. 2, <i>Hardwick-road, Eastbourne, Sussex.</i>
1851	C.	Ducie,* Right Hon. Henry John, Earl of, F.R.S. 16, <i>Portman-square, W.</i>
1875		Duckham, Joseph Hy., Esq., R.N., Dockmaster, <i>West India Docks, Limehouse Entrance, E.</i>
1875		Du Faur, Eccleston, Esq. <i>Sydney, New South Wales. Care of Miss Du Faur, 74, Lansdowne-road, Kensington-park, W.</i>
1860	C.	Duff,* Mountstuart Elphinstone Grant, Esq., M.P. <i>York-house, Twickenham.</i>
1868		Duff, Wm. Pirie, Esq. <i>Calcutta. Care of Messrs. John Watson and Co., 34, Fenchurch-street, E.C.</i>
1857	PRES.	Dufferin,* Right Hon. Fredk. Temple Hamilton-Blackwood, Earl of, K.P., G.C.M.G., K.C.B., F.R.S. <i>Clandeboyne, near Belfast, Ireland.</i>
1866		Dugdale,* Captain Henry Charles G. <i>Merevale-hall, Atherstone, Warwick.</i>
1867		Dugdale,* John, Esq. 1, <i>Hyde-park-gardens; and Lhewyn, Llanfyllin, Oswestry.</i>
1868		Dunbar, John Samuel A., Esq. 28, <i>Pembroke-crescent, Baywater, W.; and 4, Barnard's-inn, Holborn.</i>
1863		Duncan, Major Francis, R.A., M.A., D.C.L., LL.D. <i>Scientific Club, 7, Saville-row, W.</i>
1861		Duncan,* George, Esq. 45, <i>Gordon-square, W.C.</i>
1875		Duncan, John, Esq.
1878		Duncan, William Alexander, Esq. <i>Herbert-terrace, Fallowfield, near Manchester.</i>
1877		Duncan, W. H. G., Esq. <i>Scientific Club, 7, Saville-row, W.</i>
1879		Dunkley, Wm. W., Esq., M.D. <i>Foleshill, Coventry; and 7, Westminster-chambers, Victoria-street, S.W.</i>
1873		Dunlop, Alexander Milne, Esq. 28, <i>Clanricarde-gardens, W.; and 3, Old Palace-yard, Westminster, S.W.</i>
1875		Dunlop, Hamilton Grant, Esq. 11, <i>Rockstone-place, Southampton; and Junior Carlton Club, S.W.</i>
1859		Dunlop,* R. H. Wallace, Esq., C.N. (Indian Civil Service). 12, <i>Kent-gardens, Castle-hill, Ealing.</i>
1860		Dunmore,* Right Hon. Charles Adolphus Murray, Earl of. 86, <i>Brook-street, W.</i>
1868		Dunn, Captain F. J. A. <i>Portillon, Tours, France.</i>
1875		Dunn, John M., Esq. 30, <i>Claverton-street, St. George's-square, S.W.</i>
1874		Dunn, Wm., Esq. 95, <i>Bishopsgate-street-within, E.C.</i>
1867		Dunraven, Right Hon. Wyndham Thos., Earl of. <i>Coombe-wood, Kingston-on-Thames.</i>
1875		Dunstone, J. John, Esq. 6, <i>Brighton-terrace, Govan, Glasgow.</i>
1856		Duprat, Le Vicomte. <i>Consul-Général de Portugal, 10, St. Mary-Axe, E.C.</i>
1869		Durham, Edward, Esq. <i>City-house, Little Chester, near Derby.</i>
1874		Duthie, Capt. W. H., R.A. <i>Junior United Service Club, Charles-street, S.W.</i>
1868		Dutton,* Frederick H., Esq. <i>Palace-hotel, Buckingham-gate, S.W.</i>
1877		Dyason, John Sanford, Esq. 12, <i>Boscobel-gardens, N.W.</i>
1874		Dykes, William Alston, Esq. (Provost of Hamilton). <i>The Orchard, Hamilton, N. B.</i>
1870		Dymes, Daniel David, Esq. <i>Windham Club, S.W.</i>

Year of  
Election.

- 1871 Earle, Arthur, Esq. *Childsall-lodge, Wavertree, near Liverpool; and Windham Club, S.W.*
- 1878 East, George, Esq., F.Z.S. 25, *Hyde-park-place, W.*
- 1877 Easton, Edward, Esq., C.E. 7, *Delahay-street, Westminster, S.W.*
- 1869 Eastwick, Edward B., Esq., F.R.S. 54, *Hogarth-road, S. Kensington, S.W.*
- 1857 Eastwick, Captain W. J. 12, *Leinster-gardens, Hyde-park, W.*
- 1876 Eaton, Commr. Alfred, R.N. *Brook-house, Melling, near Liverpool.*
- 1862 Eaton,\* Henry William, Esq., M.P. 16, *Prince's-gate, Hyde-park, S.W.*
- 1864 Eaton,\* William Meriton, Esq. 16, *Prince's-gate, Hyde-park, S.W.*
- 1866 Eatwell, Surgeon-Major W. C. B., M.D. *Oriental Club, Hanover-square, W.*
- 1876 Ebdon, Alfred, Esq. *Care of James Searight, Esq. 7, East India-avenue, E.C.*
- 1875 Ebdon,\* Charles J., Esq., B.A. *Coghurst-hall, Hastings.*
- 1861 Eber, General F.
- 1862 Ebury, Right Hon. Lord. 107, *Park-street, Grosvenor-square, W.; and Moor-park, Herts.*
- 1879 Eden, C. H., Esq. 16, *Warwick-square, S.W.*
- 1879 Eden, Rev. Robert. *Duchy Lausanne, Switzerland.*
- 1858 Edge, Rev. W. J., M.A. *Combe-Martin-house, Upper Tooting, S.W.*
- 1863 Edgeworth, M. P., Esq. (Bengal Civil Service).
- 1866 Edwardes,\* Thomas Dyer, Esq. 5, *Hyde-park-gate, Kensington, W.*
- 1871 Edwardes,\* Thomas Dyer, Esq., jun. 5, *Hyde-park-gate, Kensington, W.*
- 1868 Edwards, Rev. A. T., M.A. 39, *Upper Kennington-lane, S.E.*
- 1865 Edwards, G. T., Esq., M.A. 7, *Queensborough-terrace, Kensington-gardens, W.*
- 1861 Edwards,\* Henry, Esq., M.P. 53, *Berkeley-square, W.*
- 1871 Edwards, James Lyon, Esq. *Holmwood, Kingston-hill, Surrey.*
- 1860 Edwards, Colonel J. B., R.E., C.B. *United Service Club, S.W.; and Shorncliffe Camp, Kent.*
- 1853 Egerton, Rear-Admiral the Hon. Francis, M.P. *Devonshire-house, W.*
- 1868 Elder, A. L., Esq. *Campden-house, Kensington, W.*
- 1863 Elder,\* George, Esq. *Knock-castle, Ayrshire.*
- 1878 Elder, Sir Thomas. *Birkgate, Adelaide, S. Australia. Care of A. L. Elder, Esq., Campden-house, Kensington, W.*
- 1867 Eley, Charles John, Esq. 5, *Pelham-place, Kensington, S.W.*
- 1865 6. p. Elias, Ney, jun., Esq. 33, *Inverness-terrace, Baywater, W.*
- 1870 Ellenborough, Colonel Lord. *Holly Spring, Bracknell, Berks; and 39, Chapel-street, Belgrave-square, S.W.*
- 1876 Elles, Jamieson, Esq. *Wimbledon-common, S.W.*
- 1876 Elles, Lieut.-Col. Wm. K., C.B. *Horse Guards, War-office, Pall-mall, S.W.*
- 1875 Elliot,\* Colonel Chas., C.B. 28, *Stafford-terrace, Kensington, W.*
- 1860 Elliot, G., Esq., C.E. *The Hall, Houghton-le-Spring, near Fence Houses, Durham.*
- 1857 Elliot,\* Capt. L. R. *La Mailleraye-sur-Seine, Seine Inférieure. Care of J. L. Elliot, Esq., C4, Albany, W.*



List of Fellows of the

Year of Election.		
1871		Elliot, William, Esq. 132, Denmark-hill, Camberwell, S.E.
1878		Elliot, Lieut. The Hon. William Fitzwilliam. 48, Eaton-square, S.W.; and Minto-house, Haicock, N.B.
1875	C.	Ellis, Sir Barrow H., K.C.S.I. (Mem. Council of India). 69, Cromwell-road, S.W.; and India-office, S.W.
1873		Ellis, Hon. Evelyn H. Raleigh Club, Regent-street, S.W.
1878		Ellis, Philip, Esq. Wilford-grove, Nottingham.
1865		Ellis, W. E. H., Esq. Hasfield-rectory, W.; and Oriental Club, Gloucester Byculla Club, Bombay.
1871		Ellis, Walter L. J., Esq. 7, Brunswick-place, Regent's-park, N.W.
1874		Elmslie, Jas. A., Esq. Crosscall-lodge, Bedford.
1858		Elphinstone, Major Sir Howard C., V.C., R.E., K.C.B., C.M.G. Buckingham-palace, S.W.
1875		Elsey, Jno. Green, Esq. Morant-house, Addison-road, Kensington, W.
1869		Elsey, Colonel William. West-lodge, Ealing, W.
1857		Elton, Sir A. H., Bart. Athenæum Club, S.W.; and Clevedon-court, Somersetshire.
1872		Elwell, W. R. G., Esq. Bathurst-lodge, Spring-grove, Isleworth.
1868		Ely, John Henry Wellington Graham Loftus, Marquis of. 9, Prince's-gate, S.W.; and Ely-castle, Fermanagh.
1877		Emery, John, Esq. 15, Dugnall-park-villas, South Norwood.
1860		Enfield, Edward, Esq., F.S.A. 19, Chester-terrace, Regent's-park, N.W.
1877		England, Capt. W. G., R.N. St. George's-lodge, Ealing, W.; and United Service Club, Pall-mall, S.W.
1863		Engleheart, Gardner D., Esq. Duchy of Lancaster Office, Lancaster-place, W.C.
1876		Errington, Geo., Esq., M.P. 16, Albany, W.
1876		Erskine,* Hon. Chas. H. S. Alloa-park, Alloa, N.B.
1870		Erskine, Claude J., Esq. (Bombay Civil Service). 87, Harley-street, W.; and Athenæum Club, S.W.
1852	P.	Erskine, Admiral John Elphinstone. 1 L, Albany, W.; and Lochend, Stirling, N.B.
1877		Escott, T. H. S., Esq. 38, Brompton-crescent, S.W.
1857		Esmeeade,* G. M. M., Esq. 50, Park-street, Grosvenor-square, W.
1877		Estoclet, Alphonse, Esq. St. Mary's-college, Hanover-park, Peckham.
1874		Evans,* B. Hill, Esq.
1870		Evans,* Edward Bickerton, Esq. Whitbourne-hall, near Worcester.
1877		Evans, Edward Prichard, Esq. 21, Prinrose-hill-road, Regent's-park, N.W.
1876		Evans, Colonel E. L. M. East India United Service Club, 14, St. James's-square, S.W.
1857	C p	Evans, Captain F. J. O., R.N., C.B., F.R.S., F.R.A.S. Hydrographic-office, Admiralty, S.W.
1857		Evans, Thos. Wm., Esq., M.P. Allestree-hall, Derby.
1830		Evans,* W., Esq.
1865		Evans, Colonel William Edwyn. 55, Seymour-street, Portman-square, W.

Year of  
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1867		Evans, W. Herbert, Esq. <i>Forde Abbey, Chard, Dorset.</i>
1861		Evelyn, Lieut.-Colonel George P. <i>Hartley-manoir, Dartford, Kent.</i>
1851		Evelyn,* William J., Esq., F.S.A. <i>Wotton-house, Wotton, near Dorking.</i>
1830		Everett,* James, Esq., F.S.A.
1865		Everitt, George A., Esq. <i>Knowle-hall, Warwickshire.</i>
1874		Evill, William, Esq. <i>Lyncombe-house, St. John's-hill, Wandsworth.</i>
1873		Ewart, John, Esq. 46, <i>Longridge-road, Earl's-court, S.W.</i>
1856		Ewing, J. D. Crum, Esq.
1857	Ex. p.	Eyre, Edward J., Esq. <i>The Grange, Steeple Aston, Oxford.</i>
1861		Eyre, George E., Esq. 59, <i>Lowndes-square, Brompton, S.W.</i>
1856		Eyre, Major-Gen. Sir Vincent, K.C.S.I. <i>Athenaeum Club, S.W.</i>
1873		Fair, John, Esq. 50, <i>Hamilton-terrace, St. John's-wood, N.W.</i>
1870		Fairbridge, Charles, Esq. <i>Care of Rev. J. R. Izat, Balscott, near Banbury.</i>
1869		Fairfax, Captain Henry, R.N. <i>Army and Navy Club, S.W.</i>
1856		Fairholme, George Knight, Esq. <i>Care of Mr. Ridgway, 169, Piccadilly, W.</i>
1870		Fairland, Edwin, Esq., M.D. (Surg. 21st Hussars). <i>Lucknow, Oude.</i>
1838	p.	Falconer, Thomas, Esq. <i>Usk, Monmouthshire.</i>
1857		Falkland, Right Hon. Lucius Bentinck, Viscount. <i>Skutterskelfe, Yorkshire.</i>
1871		Fane, Edward, Esq. 14, <i>St. James's-square, S.W.</i>
1879		Fane, Henry Prinsep, Esq. <i>Fulbeck-hall, Grantham.</i>
1879		Fane, Wm. Dashwood, Esq. <i>Melbourne-hall, near Derby.</i>
1855		Fanshawe,* Admiral E. G., C.R. <i>Portsmouth.</i>
1878	p.	Farler, Rev. J. P. <i>St. Paul's-choir-house, Dean's-court, E.C.</i>
1874		Farmer, Edmund, Esq. 10, <i>Southwick-place, Hyde-park-square, W.</i>
1873		Farmer, James, Esq. 6, <i>Porchester-gate, Kensington-gardens, W.</i>
1874		Farquhar, Walter, Esq. <i>Care of Messrs. Forbes, Forbes and Co., 9, King William-street, E.C.</i>
1868		Farquharson,* Major-Gen. G. McB. <i>Breda, Aberdeenshire; and United Service Club, Pall-mall, S.W.</i>
1875		Farrer, Hy. Richd., Esq. 46, <i>Eaton-place, S.W.; and Green Hammerton-hall, York.</i>
1863		Farrer,* W. Jas., Esq. 18, <i>Upper Brook-street, W.</i>
1876		Farzana, Mirza Rahim. (Teheran.) <i>Care of Messrs. Grindlay and Co., 55, Parliament-street, S.W.</i>
1877		Faulkner, Joseph, Esq. 101, <i>Asylum-road, S.E.</i>
1863		Faunthorpe,* Rev. J. P., M.A. <i>Whitelands Training-college, Chelsea.</i>
1869		Fawcett, Captain Edward Boyd, M.A. 3, <i>Barnpark-terrace, Teignmouth, Devon.</i>
1874		Fawssett, Frederick, Esq., M.D. <i>Westgate, Louth, Lincolnshire.</i>



Year of Election		
1853		Fayrer, * Surgeon-General Sir Joseph, K.C.S.I., M.D. 16, <i>Granville-place, Portman-square, W.</i>
1875		Feilden, Capt. Hy. Wemyss, R.A. 2, <i>Grosvenor-terrace, Aldershot.</i>
1876		Feilden, * Lieut.-Col. O. B. (78th Highlanders). 7, <i>Sussex-gardens, Hyde-park, W.</i>
1866		Felkin, William, Esq., jun., F.Z.S. <i>Care of Mrs. H. Dawson, 8, Stratford-square, Nottingham.</i>
1872		Fenner, William A., Esq. <i>Thatched-House Club, St. James's-street, S.W.</i>
1875		Ferguson, Jno., Esq. 10, <i>Staple-inn, W.C.</i>
1840	C.	Fergusson, * James, Esq., F.R.S., D.C.L. 20, <i>Langham-place, W.</i>
1875		Fergusson, Right Hon. Sir James, Bart. <i>Kilkerran, Maybole, N.B.</i>
1876		Ferris, Colonel W. Spiller. 1, <i>St. Michael's-gardens, Notting-hill, S.W.</i>
1871		Festing, Major Robert, R.E. <i>South Kensington Museum, S.W.</i>
1876		Few, Robert Hamilton, Esq. <i>Southery-grange, Lingfield-road, Wimbledon.</i>
1878		Field, George W., Esq. 39, <i>Upper Brook-street, W.</i>
1874		Fielden, Joshua, Esq., M.P. <i>Nutfield-priory, Redhill, Surrey.</i>
1878		Fielding, Charles, Esq. 9, <i>Culham-street, E.C.; and Verulam Club.</i>
1875		Figgis, * Samuel, Esq. <i>The Laven, 105, Tulse-hill, S.W.</i>
1877		Finch, Jonadab, Esq. <i>Alma-house, Willesden.</i>
1877		Findlay, John, Esq. <i>Monk's-farm, Lancing, Sussex.</i>
1877		Finn, Alexander, Esq. <i>Teheran.</i>
1874		Firth, Fras. Helme, Esq. 25, <i>Cockspur-street, S.W.</i>
1870		Firth, * John, Esq., J.P. <i>Care of Messrs. R. Buckland and Son, Hop-gardens, St. Martin's-lane, W.C.</i>
1869		Fitch, Frederick, Esq., F.R.M.S. <i>Hadleigh-house, Highbury-new-park, N.</i>
1876		Fitz-Adam, * John T., Esq. 5, <i>Phillimore-gardens, Kensington, W.</i>
1857		Fitzclarence, * Commander the Hon. George, R.N. 1, <i>Warwick-square, S.W.</i>
1872		Fitzgerald, A., Esq. <i>Verulam Club, 54, St. James's-street, S.W.</i>
1874		Fitzgerald, G. V. S., Esq. <i>India-office, S.W.</i>
1861		Fitzgerald, Captain Keane.
1873		Fitz-Gerald, R. U. Penrose, Esq. 110, <i>Eaton-square, S.W.</i>
1873		Fitz-James, Frank, Esq., C.E. <i>Benares. Care of W. Whiteley, Esq., Westbourne-grove, Bayswater.</i>
1874		Fitz Roy, * Capt. Rob. O'Brien, R.N. <i>United Service Club, Pall-mall.</i>
1857		Fitzwilliam, The Hon. C. W., M.P. <i>Brooks's Club, St. James's-street, S.W.</i>
1837		Fitzwilliam, * William Thomas, Earl. 4, <i>Grosvenor-square, W.; and Wentworth house, Rotherham, Yorkshire.</i>
1863		Fleming, G., Esq. 30, <i>Cambridge-road, Kilburn, N.W.</i>
1861		Fleming, * John, Esq., C.S.I. <i>Wych Elm-lodge, College-road, Dulwich.</i>
1878		Fleming, Sandford, Esq., C.M.G., F.G.S. <i>Ottawa, Canada.</i>
1865		Fleming, Rev. T. S. <i>The Vicarage, St. Clement's, Leeds.</i>
1853	p.	Flemyng, * Rev. Francis P. <i>Sgor Bheann, near Dunoon, Argyllshire.</i>
1857		Fletcher, Thomas Keddey, Esq. <i>Union-dock, Limehouse, E.</i>
1878		Fletcher, W. Henry, Esq. <i>Park-lodge, Blackheath-park, S.E.</i>
1876		Floersheim, * Louis, Esq. 11, <i>Hyde-park-street, W.</i>

Year of Election.		
1877		Florence, Ernest Badinius, Esq. 6, <i>Prince of Wales-terrace, Kensington; and 5, Pump-court, Temple, E.C.</i>
1876	P.	Floyer, Ernest A., Esq. <i>Care of Mrs. Floyer, 7, The Terrace, Putney, S.W.</i>
1877		Foggo, Geo., Esq. <i>Oriental Club, W.</i>
1873		Fogo, J. M. S., Esq. (Surg.-General). <i>Army and Navy Club, Pall-mall, S.W.</i>
1864		Foley, Lieut.-Gen. the Hon. St. George, C.B. 24, <i>Bolton-street, W.</i>
1876		Foljambe,* Cecil G. S., Esq. <i>Cockglode, Ollerton, Newark.</i>
1874		Folkard, A., Esq. <i>Thatched-House Club, St. James's-street, S.W.</i>
1861		Food, John Bromley, Esq. <i>May-villa, Bexley-heath.</i>
1874		Foot,* Capt. C.E., R.N. <i>Care of Messrs. Woodhead and Hildreth, 44, Charing-cross, S.W.; and United Service Club, Pall-mall.</i>
1874	P.	Forbes, A. Litton A., Esq.
1863	P.	Forbes, Capt. C. J. F. Smith. <i>Care of Messrs. H. S. King and Co., 45, Pall-mall, S.W.</i>
1867		Forbes, Geo. Edward, Esq. <i>New Club, Edinburgh.</i>
1873		Forbes, General Jno., C.B. <i>Interernan, Strathdon, Aberdeenshire; and Messrs. Forbes and Co., 25, Cockspur-street, S.W.</i>
1874		Forbes, Major Jno. G., R.E. <i>Care of Messrs. Grindlay and Co., 55, Parliament-street, S.W.; and 14, St. James's-square, S.W.</i>
1876		Forbes, J. S., Esq. <i>London, Chatham &amp; Dover Railway Office, Victoria-stat., S.W.</i>
1860		Forbes, Lord, M.A. <i>Castle Forbes, Aberdeenshire.</i>
1873		Forbes, W. F., Esq. <i>Lock-cote-house, Bathgate, N. B.; and Castleton.</i>
1879		Forbes-Mitchell, J., Esq. <i>Thainstone, Kintore, Aberdeenshire, N. B.</i>
1869		Ford, Major-General Barnett (late Governor of the Andaman Islands). 31, <i>Queensborough-terrace, Hyde-park, W.</i>
1875		Ford,* Francis Clare, Esq., C.B., C.M.G.
1874		Forde, Henry Charles, Esq., C.E. <i>St. Brendan's, Wimbledon, S.W.</i>
1874	P.	Forlong,* Major-General J. G. R. (Madras Staff Corps). <i>Chartered Mercantile Bank, 65, Old Broad-street, E.C.</i>
1872	P.	Forrest,* Alex, Esq., Survey Department of Perth. <i>Western Australia.</i>
1876		Forrest, James, Esq. <i>Kirriemuir, N. B.</i>
1872	Ex. P.	Forrest,* Jno., Esq. <i>Perth, Western Australia.</i>
1874		Forasman, Comr. O. A. (Consul for Portugal). <i>Potschefstroom, Transvaal Republic, S. Africa. Care of Vicomte Duprat, 10, St. Mary-Axe, E.C.</i>
1868		Forster, Hon. Anthony. 5, <i>Anglesea-terrace, St. Leonards-on-Sea.</i>
1876		Forster,* John, Esq. <i>Oriental Club, Hanover-square, W.</i>
1839		Forster,* Right Hon. William Edward, M.P. 80, <i>Eccleston-square, S.W.; and Burley, near Otley.</i>
1867	C. P.	Forsyth, Sir T. Douglas, K.C.S.I., C.B. 76, <i>Onslow-gardens, S. Kensington, S.W.</i>
1861		Forsyth, William, Esq., M.P., Q.C. 61, <i>Rutland-gate, S.W.</i>
1861		Fortescue,* Hon. Dudley F. 9, <i>Hertford-street, Mayfair, W.</i>
1873		Foss, Edward William, Esq. <i>Frensham-house, Croydon.</i>
1873		Foss, G. Lush, Esq. <i>Clevedon-house, Coronation-road, Bristol.</i>
1866		Foster, Edmond, Esq., jun. 130, <i>Lexham-road, Crompton-road, W.</i>



List of Fellows of the

Year of Election.		
1878		Foster, Norris T., Esq. <i>Adelaide-street, Vauxhall, Birmingham.</i>
1876		Foster, R. G., Esq. 4, <i>St. James's-place, Gloucester.</i>
1873		Fowler, A. Grant, Esq. <i>Care of Alex. Denoon, Esq., Beckenham, Kent.</i>
1863		Fowler,* J. T., Esq. <i>Care of Rev. A. Wilson, M.A., National Society's Depot, Sanctuary, Westminster, S.W.</i>
1872		Fowler,* John, Esq., C.E. <i>Thornwood-lodge, Campden-hill, W.</i>
1850		Fowler,* Robert N., Esq. M.A. 50, <i>Cornhill, E.C.; and Tottenham.</i>
1859		Fox, Maj.-Gen. A. Lane. 30, <i>Sussex-place, Onslow-gardens, S.W.</i>
1866		Fox, D. M., Esq., Chief Eng. Santos and St. Paulo Railway. <i>St. Paulo, Brazil. Care of G. H. Hillier, Esq., 111, Gresham-house, Old Broad-street, E.C.</i>
1864		Fox,* Francis E., Esq., B.A. <i>Uplands, Tamerton Foliot, Plymouth.</i>
1876		Fox, Francis Wm., Esq. <i>Grove-house, Stoke Bishop, near Bristol.</i>
1876		Fox, Lieut. T. A., R.N.R. <i>Care of Messrs. H. S. King and Co., 65, Cornhill, E.C.</i>
1879		Francis, Frederick, Esq. 36, <i>Courtfield-gardens, South Kensington, S.W.</i>
1865		Franks,* Aug. W., Esq. 103, <i>Victoria-street, S.W.</i>
1860		Franks, Charles W., Esq.
1862		Fraser, Captain H. A., I.N. <i>Zanzibar.</i>
1874		Fraser, Jas. Grant, Esq., C.E. 9, <i>Great Queen-street, Westminster, S.W.</i>
1866		Fraser, Captain T. <i>Care of Messrs. Grindlay and Co., 55, Parliament-street, S.W.</i>
1868		Frazer, Alex., Esq. H.M. Consul, <i>Tamsuy, Formosa. Care of James Frater, Esq., Town-house, Aberdeen.</i>
1879		Frazer, John, Esq. <i>Sydney, New South Wales; and 72, Cornhill, E.C.</i>
1873		Freeland, H. W., Esq. <i>Chichester; and Athenaeum Club, Pall-mall.</i>
1878		Freeling, Sir Sanford, K.C.M.G. (Governor of the Gold Coast Colony). 2, <i>Vyryan-terrace, Clifton, near Bristol.</i>
1868		Freeman, Henry W., Esq. <i>Thirlestaine-hall, Cheltenham.</i>
1869		Freke, Thomas George, Esq. 1, <i>Cromwell-houses, Kensington, S.W.</i>
1863		Fremantle, Captain Hon. Edmund Robert, R.N., C.B., C.M.G. 20, <i>Faton-place, S.W.</i>
1877		Frere, Lieut. Bartle C. A. <i>Care of Messrs. Cox and Co., Craig's-court, S.W.</i>
1850		Frere, Bartle John Laurie, Esq. 45, <i>Bedford-square, W.C.</i>
1867	PRES. P.	Frere, Right Hon. Sir Hy. Bartle Edw., Bart., P.C., G.C.B., G.C.S.I., D.C.L. <i>Cape Town.</i>
1842		Frere, William Edw., Esq., F.R.A.S. 5, <i>Kings's Bench-walk, Temple, E.C.</i>
1869	C. P.	Freshfield,* Douglas W., Esq. <i>Kidbrooke-park, East Grinstead; 6, Stanhope-gardens, S. Kensington, S.W.; and United University Club, S.W.</i>
1873		Freshfield,* W. Dawes, Esq. 64, <i>Westbourne-terrace, W.</i>
1877	P.	Frewen, Richard, Esq. <i>Care of Messrs. Castle and Lamb, Fleet-street, E.C.</i>
1872		Friedrichsen, Aug. Daniel, Esq. <i>St. Huberts, Hayne-road, Beckenham, Kent.</i>
1874		Frith, Rev. William. 3, <i>Brunswick-villas, Cambridge-road, Turnham-green.</i>
1876		Fry,* Frederick Morris, Esq. 14, <i>Montague-street, Russell-square, W.C.</i>

Year of Election.		
1876		Fry, Rev. Henry John. 18 <i>Bessborough-street, S.W.</i>
1863		Fuidge, William, Esq. 5, <i>Park-row, Bristol.</i>
1865		Fuller, Thomas, Esq. <i>Trayton-house, Richmond-hill; and United University Club, S.W.</i>
1860		Fussell, Rev. J. G. Curry. 51, <i>Victoria-street, S.W.; and Kiloshane-castle, Templemore, Ireland.</i>
1868		Fyfe, Andrew, Esq., M.D. 112, <i>Brompton-road, S.W.</i>
1878		Fynney, F. B., Esq. <i>Maritzburg, Natal. Care of R. J. Mann, Esq., 5, Kings-down-villas, Wandsworth-common, S.W.</i>
1866	P.	Fytche, Lieut.-General Albert, C.S.I. <i>Pyrro-park, Havering-atte-Boscer, near Romford, Essex; and Reform Club, S.W.</i>
1863		Gabrielli,* Antoine, Esq. 21, <i>Queen's-gate-terrace, Kensington, S.W.</i>
1875		Gahan, C. F., Esq. <i>India-office, S.W.; and Dunkeld-house, Ramsden-road, Balham, S.W.</i>
1878		Gahan, Frederick, Esq., C.E. <i>Mahebag, Donegal, Ireland; and Irish Church Club, Dublin.</i>
1878		Galbraith, James W., Esq. <i>Care of Messrs. Patrick Henderson and Co., St. Vincent-place, Glasgow.</i>
1877		Galbraith, Wm. Robert, Esq., C.E. 91, <i>Finchley-road, N.W.</i>
1872		Gale, Henry, Esq., C.E. <i>Care of Mr. A. S. Twyford, 5, Southampton-street, Bloomsbury, W.C.</i>
1855		Galloway,* John James, Esq.
1869		Galsworthy, Frederick Thomas, Esq. 8, <i>Queen's-gate, Hyde-park, S.W.</i>
1873		Galsworthy, Robt. Herbert, Esq.
1848	C.	Galton,* Captain Douglas, R.E. 12, <i>Chester-street, Grosvenor-place, S.W.</i>
1850	Ex. C. p.	Galton,* Francis, Esq., M.A., F.R.S. 42, <i>Rutland-gate, S.W.; and Athenæum Club, S.W.</i>
1871		Galton, Theodore Howard, Esq. <i>Hadzor-house, Droitwich.</i>
1854		Gammell,* Major Andrew. <i>Drumtochty, Kincardineshire, N.E.</i>
1877		Gardiner, Chas., Esq. <i>The Temple, Goring, Oxford.</i>
1873		Gardiner,* H. J., Esq. <i>Hurstnead, Eltham, S.E.</i>
1869	p.	Gardner, Christopher T., Esq. (H.M. Consul, <i>Kiungchow, China</i> ). <i>Care of John Gardner, Esq., Sabiaca-lodge, Roehampton-lane.</i>
1865		Gardner, Rear-Admiral G. H. <i>Woodside, Eltham.</i>
1876		Gardner, Henry Dent, Esq. <i>Sherwood, Eltham-road, S.E.</i>
1866		Gardner, John Dunn, Esq.
1876		Garvagh, Lord. <i>White's Club, St. James'-street, S.W.</i>
1863		Gascoigne, Frederic, Esq.
1875		Gaskin, Rev. Joseph. <i>Chateau Belle Assise, Boulogne-sur-Mer. Care of J. H. Gaskin, Esq., Home-office, Whitehall, S.W.</i>
1859		Gassiot,* John P., jun., Esq. <i>The Culvers, Carshalton, Surrey.</i>
1866		Gastrell, Lieut.-Col. James E. (Beng. Staff Corps). 7, <i>Lansdowne-rd., Wimbledon.</i>



## List of Fellows of the

Year of Election.		
1866		Gatty,* Charles H., Esq., M.A. <i>Felbridge-park, East Grinstead, Sussex.</i>
1873		Gawler, Colonel J. C. <i>Tower of London, E.C.</i>
1875		Gayfer, Wm., Esq., M.A., LL.D. <i>Middle-class-school, Bromley, Kent.</i>
1879		Gedge, Sydney, Esq. <i>Mitcham-hall, Mitcham.</i>
1873		Geiger,* Jno. Lewis, Esq. 75, <i>Onslow-gardens, South Kensington, S.W.</i>
1878		Gell, Rev. A. Hamilton, M.A. 44, <i>Eaton-square, S.W.</i>
1870		Gellatly,* Edward, Esq. <i>Uplands, Sydenham.</i>
1865		George, Rev. H. B. <i>New College, Oxford.</i>
1876		Ghewy,* Albert Brown, Esq., C.E. <i>Thatched-House Club, S.W.</i>
1866		Gibb,* George Henderson, Esq. 13, <i>Victoria-street, Westminster, S.W.</i>
1878		Gibbons,* Chas. Cockburn, Esq. (H.M. Vice-Consul, <i>Ponce, Porto Rico</i> ). <i>Care of Messrs. Woodhead and Co., 44, Charing-cross, S.W.</i>
1859	C.	Gibbs,* H. Hucks, Esq. <i>St. Dunstan's, Regent's-park, N.W.</i>
1873		Gibbs, James, Esq., C.S.I.
1873		Gibbs, Jno. Dixon, Esq. <i>Conservative Club, St. James's, S.W.</i>
1870		Gibson, James Y., Esq. <i>Care of Messrs. Williams and Norgate, Henrietta-street, Covent-Garden, W.C.</i>
1877	p.	Giles, Ernest, Esq. <i>Care of Hon. T. Elder, Adelaide, S. Australia.</i>
1877		Giles, Rev. Wm. Theophilus, M.A. <i>Netherleigh, Chester.</i>
1877		Gilford,* Rear-Admiral the Right Hon. Lord. 8, <i>Hereford-gardens, W.; and Admiralty, Whitehall, S.W.</i>
1874	p.	Gill, Captain W. J., R.N. 1, <i>Edinburgh-mansions, Victoria-street; and Junior United Service Club, Charles-street, S.W.</i>
1866		Gillespie,* William, Esq. (of <i>Torbane-hill</i> ). 46, <i>Melville-street, Edinburgh.</i>
1868		Gillett,* Alfred, Esq.
1863		Gillett,* William, Esq. 6, <i>William-street, Loundes-square, S.W.</i>
1868		Gilliat, Algernon, Esq. 7, <i>Lancaster-gate, W.</i>
1863		Gillies,* Robert, Esq., C.E. <i>Care of Messrs. Reith and Wilkie, Dunedin, Otago, N.Z. Per Messrs. Sampson Low and Co., 188, Fleet-street, E.C.</i>
1874		Gilman,* Ellis, Esq. <i>Berkeley-mansions, 64, Seymour-street, W.</i>
1877		Gisborne, Thomas Matthew, Esq. 4, <i>Upper St. Germain's, Blackheath.</i>
1864		Gladstone, George, Esq. 31, <i>Ventnor-villas, Cliftonville, Brighton.</i>
1863		Gladstone, J. H., Esq., Ph.D. 17, <i>Pembroke-square, W.</i>
1862		Gladstone,* Robert Stuart, Esq. <i>Windham Club, S.W.</i>
1873		Glanville, Silvanus Goring, Esq.
1867		Glass, H. A., Esq. <i>St. Kilda, Vanbrugh-park, Blackheath, S.E.</i>
1872		Glass, James George Henry, Esq. 28, <i>London-street, Edinburgh. Care of Messrs. H. S. King and Co., 45, Pall-mall, S.W.</i>
1854		Glen, Joseph, Esq., Mem. Geogr. Soc. of Bombay. <i>Oriental Club, W.</i>
1857	p.	Glover, Capt. Sir John H., R.N., G.C.M.G. 27, <i>Bury-street, St. James's, S.W.</i>
1866		Glover, Robert Reaveley, Esq. 22, <i>Great St. Helen's, E.C.</i>
1870		Glover, Colonel T. G., R.E. <i>Barwood, Hersham, near Esher, Surrey.</i>
1864		Glyn, Sir Richard George, Bart. <i>Army and Navy Club, S.W.</i>
1878	p.	Goad, Thomas William, Esq. <i>Care of Messrs. Coutts and Co., Strand, W.C.</i>

C. p.

Year of Election.	
1874	Godman,* F. Du Cane, Esq. 10, Chandos-street, Tavistock-square, W.; and Child Okeford-house, Blandford.
1874	Goldsmid, Bartle, Esq. 16, Queen's-gate-terrace, S.W.
1863	Goldsmid, Maj.-Gen. Sir Frederic John, K.C.S.I., C.B. 3, Observatory-avenue, Kensington; and United Service Club, S.W.
1861	Goldsmid, Sir Julian, Bart. 105, Piccadilly, W.
1873	Goldsworthy, R. Tuckfield, Esq. Army and Navy Club.
1860	Gooch, Thomas Longridge, Esq. Team-lodge, Saltwell, Gateshead-on-Tyne.
1877	Goodall, Abraham, Esq., F.R.C.S., Inspector-General of Hospitals (Retired List). 4, Elvaston-place, Queen's-gate, S.W.
1864	Goodall, George, Esq. Junior Carlton Club, S.W.
1864	Goodenough,* Lieut.-Col. W. H., R.A. 49, Weymouth-street, Portland-place, W.
1875	Gooding, Jas. W., Esq. 18, Aldersgate-street, E.C.
1874	Goodliffe, Fras. Gimber, Esq.
1877	Goodliffe,* Henry, Esq. Junior Athenæum Club, W.
1877	Goodman, Alfred Wm., Esq. Heath-house, Belvedere, Kent.
1871	Goodwin,* William, Esq. 27, Grosvenor-road, Birkenhead.
1865	Goolden,* Charles, Esq. United University Club, S.W.
1861	Goolden, Joseph, Esq. 18, Lancaster-gate, W.
1856	Gordon,* General the Hon. Sir Alexander H., K.C.B. 50, Queen's-gate-gardens, South Kensington, S.W.
1878	Gordon, Major Edward Smith, R.A. Royal Carriage Department, Royal Arsenal, Woolwich; and Naval and Military Club, Piccadilly, W.
1879	Gordon, Rev. Geo. Maxwell. Care of Major Gordon, R.A., Woolwich.
1873	Gordon, J. Newall, Esq. Morro Velho, Minas Geraes, Brazil; and 49, George-street, Portman-square, W.
1874	Gordon, Robt., Esq., C.E. Care of Mr. D. Nutt, 270, Strand, W.C.
1870	Gordon, Russell Manners, Esq. Care of Messrs. Roberts, Lubbock and Co., 15, Lombard-street, E.C.
1866	Gore, Colonel Augustus F. Care of Messrs. Hallett and Co., 7, St. Martin's-place, W.C.
1853	Gore, Richard Thomas, Esq. 6, Queen-square, Bath.
1874	Gore, Lieut. St. George C., R.E. Care of Messrs. Grindlay and Co., 55, Parliament-street, S.W.
1879	Goren, James Newton, Esq. 6, Stone-buildings, Lincoln's-inn, W.C.
1859	Goaling, Fred. Solly, Esq. 20, Spring-gardens, S.W.
1870	Gottlieb, Felix Henry, Esq., J.P. Singapore.
1875	Gotto, Hy. Jenkin, Esq. Croft-lodge, Highgate-road, N.W.
1868	Gough, Hugh, Viscount, F.L.S. Lough Cutra Castle, Gort, Co. Galway.
1876	Gould,* Abraham, Esq. Somerset-lodge, 111, Adelaide-road, N.W.
1873	Gould, Rev. Jas. Aubrey. L 4, Albany, W.
1846	Gould, John, Esq., F.R.S., F.L.S. 26, Charlotte-st., Bedford-square, W.C.
1870	Gould, Rev. Robert John. Stratfield Mortimer, near Reading.
1872	Gourley, Colonel E., M.P. Sunderland.



Year of Election.		
1867		Grabham, Michael, Esq., M.D.
1868		Graeme, H. M. S., Esq. <i>Care of Messrs. Grindlay and Co., 55, Parliament-street, S.W.</i>
1869		Graham, Andrew, Esq. (Staff Surg. R.N.). <i>Army and Navy Club, S.W.</i>
1858	C. p.	Graham, Cyril C., Esq., C.M.G. (Governor of Grenada, West Indies).
1871		Graham, J. C. W. Paul, Esq. 1, <i>Carlisle-place, Victoria-street, S.W.; and Brooks's Club, St. James's-street, S.W.</i>
1879		Graham,* James, Esq. <i>Highwood-house, Kingston, Surrey.</i>
1874		Graham, James Henry Stuart, Esq. 1, <i>Belgrave-road, Shepherd's-bush, W.</i>
1875		Graham, Robert Geo., Esq. <i>St. Albans, Hampton-on-Thames.</i>
1868		Graham,* Thomas Cuninghame, Esq. <i>Carlton Club, S.W.; and Dunlop-house, Ayrshire.</i>
1870		Grant,* Andrew, Esq. <i>Intermay-house, Bridge of Earn, N. B.</i>
1863	p.	Grant,* C. Mitchell, Esq.
1861		Grant, Daniel, Esq. 12, <i>Cleveland-gardens, Hyde-park, W.</i>
1865		Grant,* Francis W., Esq. 40, <i>Pall-mall, S.W.</i>
1860	Ex. C. p.	Grant, Lieut.-Col. James A., C.B., C.S.I., F.R.S. <i>E. India U. S. Club, S.W.; 19, Upper-Grosvenor-street, W.; and Househill, Nairn, N. B.</i>
1875		Grant, Jno., Esq. <i>Grampian-lodge, Putney.</i>
1878		Grant, Lieut. John Macpherson (92nd Highlanders). <i>The Castle, Ballindalloch, N. B.</i>
1879		Grant, W. J. A., Esq. <i>Hillesdon, Colington.</i>
1874		Grantham, Geo., Esq. <i>Barcombe-place, near Leves.</i>
1876		Grattan, Edmund A., Esq. (H. M. Consul, Antwerp). <i>Scientific Club, Sacile-row, W.</i>
1872		Gray, Andrew, Esq.
1876		Gray,* Archibald, Esq. 37, <i>Holland-park, W.; and 13, Austin Friars, E.C.</i>
1870		Gray, Charles W., Esq. 14, <i>Chester-terrace, Regent's-park, N.W.</i>
1871		Gray, Matthew, Esq. <i>St. John's-park, Blackheath, S.E.</i>
1875		Gray,* Matthew Hamilton, Esq. <i>St. John's-park, Blackheath, S.E.</i>
1873		Gray, Robert Kaye, Esq. <i>St. John's-park, Blackheath, S.E.</i>
1868		Gray, Lieut.-Colonel William. <i>Farley-hall, Reading.</i>
1863		Greaves, Rev. Richard W. 1, <i>Whitehall-gardens, S.W.</i>
1876		Green, Geo., Esq. <i>Glanton-house, Sydenham-rise.</i>
1876		Green, Geo. P. E., Esq. 100, <i>Gower-street, Bedford-square, W.C.</i>
1871		Green, Joseph E., Esq. 12A, <i>Myddelton-square, E.C.</i>
1876		Green, Colonel Malcolm, C.B. 78, <i>St. George's-road, S.W.</i>
1879		Green, Samuel, Esq. <i>Wardleworth, Rochdale.</i>
1877		Green, Walter, Esq. 15, <i>Pall-mall, S.W.</i>
1868		Green, Rev. W., M.A. <i>Chaplain to the Tower of London.</i>
1869	C.	Green, Major-General Sir W. H. R., K.C.S.I., C.B. 93, <i>Belgrave-road, S.W.</i>
1879		Greene, Thomas Parnell, Esq. <i>Poulton-house, Hampton, Middlesex.</i>
1874		Greenfield, Thomas Challen, Esq. 84, <i>Basinghall-street, E.C.; and 6, Outram-villas, Addiscombe.</i>

Year of Election.		
1857		Greenfield,* W. B., Esq. 35, Gloucester-square, Hyde-park, W.; and Union Club, S.W.
1870		Greenup, W. Thomas, Esq. <i>The Leys, Cambridge.</i>
1858	p.	Gregory,* Sir Augustus Charles. <i>Surveyor-General, Brisbane, Queensland, Australia.</i>
1858		Gregory, Charles Hutton, Esq., C.E. 1, Delahay-street, Westminster, S.W.
1860	p.	Gregory,* Francis Thomas, Esq. <i>Queensland.</i>
1858		Gregory,* Isaac, Esq. <i>Merchants'-college, Blackpool.</i>
1872		Gregson, George, Esq. 63, Harley-street, Cavendish-square, W.
1857		Grellet,* Henry Robert, Esq. <i>Care of M. Misa, Esq., 41, Crutched Friars, E.C.</i>
1865		Grenfell, Henry R., Esq., M.P. <i>St. James's-place, S.W.</i>
1830		Greswell,* Rev. Richard, M.A., F.R.S. 39, St. Giles's-street, Oxford.
1877		Grey, Albert, Esq., B.A. <i>Dorchester-house, S.W.</i>
1866		Grey, Charles, Esq. <i>The Cottage, Staines.</i>
1837	C.	Grey,* Sir George, K.C.B.
1873		Grey, Major L. J. H., C.S.I. (Bengal Staff Corps). <i>Political Agent, Bhawal-pore State, Bhawalpore, Punjab. Care of General Van Cortlandt, 10, Onslow-crescent, South Kensington, S.W.</i>
1864		Grierson, Charles, Esq. <i>Care of Messrs. Hamilton and Co., 32, Paternoster-row, E.C.</i>
1876		Grierson, J., Esq., H.M. Consul, Coquimbo. <i>Care of Mrs. G. J. Cruikshank, Clair-villa, Saughtree, Dumfries.</i>
1874		Griesbach, C. L., Esq. <i>Care of Messrs. H. S. King and Co., 65, Cornhill, E.C.</i>
1878		Griffin, Colonel James T. <i>Seaton-house, Adamson-road, N.W.</i>
1877		Griffin, John, Esq. <i>Dunster-house, Mincing-lane, E.C.</i>
1861		Griffith,* Daniel Clewin, Esq. 20, Gower-street, W.C.
1839		Griffith, John, Esq. 16, Finsbury-place South, E.C.
1836		Griffith, Richard Clewin, Esq. 20, Gower-street, W.C.
1872		Griffiths, Arthur Edward, Esq. 25, Talbot-square, Hyde-park, W
1877		Griffiths, Rev. John, M.A. <i>Belton-rectory, Grantham.</i>
1875		Grignon, James, Esq. 36, Bury-street, St. James's, S.W.
1855		Grindrod, R. B., Esq., M.D., LL.D., F.L.S., &c. <i>Townsend-house, Malvern.</i>
1872		Grinlinton, J. J., Esq. <i>Colombo, Ceylon. Care of Edward Woods, Esq., C.E., 3, Great George-street, S.W.</i>
1861		Grosvenor, Lord Richard, M.P. 12, Upper Brook-street, Bond-street, W.
1876		Grove, George, Esq. <i>Lower Sydenham, S.E.</i>
1877		Grover,* Captain George Edward, R.E. 28, Collingham-place, Cromwell-road, S.W.
1857		Gruneisen, Charles Lewis, Esq. 16, Surrey-street, Strand, W.C.
1876		Guillemand, F. H. H., Esq. <i>Eltham, Kent.</i>
1878		Guinness, Cecil, Esq. <i>Verulam Club, St. James's, S.W.</i>
1876		Gunn, Arthur, Esq. 4, Oak-villas, Hampstead, N.W.



Year of  
Election.

- 1861 Gunnell, Captain Edmund H., R.N. *Army and Navy Club, S.W.; and 21, Argyll-road, Campden-hill, W.*
- 1859 Gurney,\* John H., Esq. *North Repps, Norwich.*
- 1857 Gurney, Samuel, Esq. 20, *Hanover-terrace, Regent's-park, N.W.*
- 1874 Gwynne, Fraz. A., Esq. 15, *Bury-street, St. James's, S.W.*
- 1872 Gwynne,\* James Eglinton W., Esq., C.N., F.S.A., J.P., &c. 97, *Harley-street, W.; and Cliff-house, Dovercourt, Essex.*
- 1876 Gwynne, Samuel G., Esq. *Shoul-hill-college, Cannock, Stafford.*
- 1865 Gwyther, John Howard, Esq. *Ellerslie, Park-hill-road, Addiscombe.*
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- 1870 Habicht, Claudius Edward, Esq. 114, *Ebury-street, Eaton-square, S.W.*
- 1878 P. Haddon, J. L., Esq. 25, *Great George-street, S.W.*
- 1878 Hadwen, John Henry, Esq. *Park-road, Wandsworth.*
- 1877 Haines, C. Henry, Esq., M.D. 1, *South-terrace, Cork.*
- 1874 Hairby, Edward, Esq. 22, *Victoria-villas, King Edward's-road, S. Hackney.*
- 1868 P. Hale, Rev. Edward, M.A. *Eton College; and United University Club, S.W.*
- 1877 Halford, F. B., Esq. 26, *Cleveland-gardens, Hyde-park, W.*
- 1853 Halifax, Right Hon. Viscount, G.C.B. 10, *Belgrave-square, S.W.; and Hickleton, Yorkshire.*
- 1853 Halkett,\* Rev. Dunbar S. *Little Bookham, Surrey.*
- 1853 Halkett,\* Commander Peter A., R.N.
- 1874 Hall, Alex. Lyons, Esq. *Lyons-court, Ladbrooke-road, Holland-park, W.*
- 1861 Hall, Charles Hall, Esq. *Watergate-house, Emsworth.*
- 1876 Hall, Ed. Alg., Esq. 20, *Clarges-street, W.*
- 1869 Hall,\* James MacAlester, Esq. *Killcan.*
- 1862 Hall, James Tebbutt, Esq. *Eastoot-lodge, Cavendish-road, Brondesbury, N.W.*
- 1871 Hall, Admiral Robert, C.N. 38, *Craven-hill-gardens, W.; and Admiralty, S.W.*
- 1863 Hall, Thomas F., Esq., F.C.S. *Effingham-house, near Leatherhead.*
- 1876 Hall, Wm. Ed., Esq. 20, *Onslow-gardens, S.W.*
- 1879 Halligey,\* Rev. John Thos. Fredk. 10, *Victoria-street, Taunton.*
- 1878 Hallowes, Francis, Esq. 7, *Savile-rose, W.*
- 1872 Halpin,\* Capt. R. C. 38, *Old Broad-street, E.C.*
- 1871 Hamilton,\* Lieut. Andrew (102nd Regiment). *The House of Falkland, Fife; and Naval and Military Club, W.*
- 1862 Hamilton, Archibald, Esq. *South Barrow, Bromley, Kent.*
- 1877 Hamilton, Charles Edward, Esq. *Apsley-house, Whitechurch, Monmouth.*
- 1861 Hamilton, Lord Claude. 83, *Portland-place, W.; and Barons-court, Co. Tyrone.*
- 1876 Hamilton, Jno. G. C., Esq. 54, *Eaton-place, S.W.*
- 1869 P. Hamilton, Admiral Richard Vesey. 14, *East Coombe-villas, Blackheath, S.E.*

Year of Election.	
1861	Hamilton, Col. Robert Wm. (Grenadier Guards). <i>Guards' Club, Pall-mall, S.W.</i>
1863	Hamilton, Rowland, Esq. <i>Oriental Club, W.</i>
1872	Hamilton, Walter, Esq. 394, <i>Brixton-road, S.W.</i>
1846	Hamilton, Rear-Admiral W. A. Baillie. <i>Macartney-house, Blackheath, S.E.</i>
1876	Hammond,* Navig.-Lieut. G. C., R.N. <i>Care of the Hydrographic-office, Admiralty, S.W.</i>
1853	Hampton, Right Hon. Lord, G.C.B. 9, <i>Eaton-square, S.W.</i> ; and <i>Westwood-park, Droitwich, Worcestershire.</i>
1874	Hanbury, R. W., Esq., M.P. <i>Nam-hall, Ashbourne, Derbyshire.</i>
1876	Hancock, E. H., Esq. <i>Leigh-villa, The Avenue, Surbiton.</i>
1858	Hand,* Admiral George S., C.B. <i>U. S. Club, S.W.</i>
1860	Handley,* Benjamin, Esq. 56, <i>Eland-road, Lavender-hill, S.W.</i>
1874	Handley, Captain Francis (late I.N.). <i>Brighton Club, 55, Old Steine, Brighton.</i>
1879	Hanham, Sir Jno. A., Bart. 49, <i>Thurloc-square, S.W.</i> ; and <i>Dean's-court Wimborne, Dorset.</i>
1866	Hanham, Commr. T. B., R.N. <i>Manston-house, near Blundford, Dorset.</i>
1861	Hankey,* Blake Alexander, Esq.
1874	Hankey, Reginald, Esq. 71, <i>Chester-square, S.W.</i> ; and <i>Arthur's Club, S.W.</i>
1870	Hankey,* Rodolph Alexander, Esq. 54, <i>Warwick-square, S.W.</i>
1857	Hankey, Thomson, Esq. 59, <i>Portland-place, W.</i>
1837	Hanmer,* Lord, F.R.S. 59, <i>Eaton-place, S.W.</i> ; and <i>Hanmer-hall and Bettles-field-park, Flintshire.</i>
1874	Hanmer,* Philip, Esq., B.A. <i>Christchurch, New Zealand.</i>
1859	Hansard,* Henry, Esq. 13, <i>Great Queen-street, W.C.</i>
1875	Hanson, R. B., Esq., M.A. <i>St. Saviour's Grammar-school, Southwark, S.E.</i> ; and <i>Surrey County Club, Brixton, S.W.</i>
1870	Harbord, Rev. John B., M.A. <i>Athenaeum Club, Pall-mall, S.W.</i>
1840	Harcourt,* Egerton V., Esq. <i>Whitwell-hall, York.</i>
1864	Hardie,* Gavin, Esq. 5, <i>Queen-street, Mayfair, W.</i>
1864	Harding, Major Charles. <i>Grafton Club, 10, Grafton-street, Piccadilly, W.</i>
1864	Harding, J. J., Esq. 1, <i>Barnsbury-park, Islington, N.</i>
1864	Hardinge, Capt. E., R.N. 32, <i>Hyde-park-square, W.</i>
1877	Hare, Evan Herring, Esq. <i>St. John's-precincts, Putney, S.W.</i>
1875	Harford, Lieut. Henry Charles (99th Regiment).
1871	Hargrave,* Joseph, Esq. <i>Fort Garry, Winnipeg, Manitoba, Canada.</i> <i>Care of the Hudson's Bay Company, 1, Lime-street, E.C.</i>
1874	Hargreaves, William, Esq.
1873	Harley, Colonel R. W., C.B., C.M.G. <i>Junior United Service Club, S.W.</i>
1868	Harper, J. A. W., Esq. 9, <i>Camden-house-road, S.W.</i>
1871	Harris, Edw., Esq. <i>Rydal-villa, Longton-grove, Upper Sydenham.</i>
1853	Harris, Admiral the Hon. Sir E. A. J., K.C.B. (H.B.M. Envoy Extraordinary and Minister Plenipotentiary, <i>The Hague, Holland</i> ). <i>Messrs. Woodhead and Co.</i>
1859	Harris, Capt. Henry, H.C.S. 35, <i>Gloucester-terrace, Hyde-park, W.</i>
1874	Harris, Reader, Esq. <i>Temple Club, Arundel-street, Strand, W.C.</i>



Year of  
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- 1879 Harris,\* Theodore, Esq. *The Cedars, Leighton Buzzard.*
- 1863 Harrison, Charles, Esq. 3, *Great Tower-street, E.C.*
- 1870 Harrison, Charles, Esq. 10, *Lancaster-gate, W.*
- 1877 Harrison, Wm. Arthur, Esq. 27, *Wesley-street, Waterloo, Liverpool.*
- 1838 C. Harrowby, Right Hon. Dudley, Earl of, F.R.S. *Sandon-house, Lichfield; and Norton, Gloucestershire.*
- 1872 Harston, Edward F. B., Esq. *Bank-chambers, 38, Throgmorton-street, E.C.*
- 1872 Hart, Frederick Ralph, Esq., F.R.A.S., Membre de la Société de Géographie de Paris. *Government-house, Trinidad, British West Indies. Care of Messrs. Sieveking, Droop, and Co., 7, Crosby-square, E.C.*
- 1873 Hart, Henry Neville, Esq. 107, *Harley-street, W.*
- 1875 Hart, James, Esq. *Winslow-house, South Norwood.*
- 1868 Hart,\* J. L., Esq. 20, *Pembridge-square, W.*
- 1879 Hart, Lionel, Esq., *Care of Messrs. Samuel Dobree and Co., 6, Tokenhouse-yard, E.C.*
- 1854 Hartland,\* F. Dixon, Esq., F.S.A., &c. 14, *Chesham-place, S.W.; and the Oaklands, near Cheltenham.*
- 1874 Hartley, Sir Chas. Aug., F.R.S.E., &c. 26, *Pall-mall, S.W.; and Reform Club, Pall-mall, S.W.*
- 1874 Hartnell, Rev. Bedford, M.A. *Clifton-college, Bristol.*
- 1875 Harvey, Alex. S., Esq. *Windsor-place, Banchory, by Aberdeen.*
- 1875 Harvey, Aug. Jno., Esq. 6, *Cromwell-terrace, Great Yarmouth, Norfolk.*
- 1878 Harvey,\* Sir Charles, Bart. *Mousehold-house, Norfolk.*
- 1863 Harvey, Charles, Esq. *Rathgar-cottage, Streatham, S.W.*
- 1867 Harvey, James, Esq. *Esk-street, Invercargill, Southland, New Zealand. Care of the Colonial Bank of New Zealand, 13, Moorgate-street, E.C.*
- 1864 Harvey, John, Esq.
- 1866 Harvey, Richard M., Esq. 13, *Devonshire-street, Portland-place, W.*
- 1877 Harvey,\* Wm. C., Esq. *City Liberal Club, Walbrook, E.C.*
- 1871 Harvie,\* Edgar Christmas, Esq. *City of London Club, Old Broad-street, E.C.*
- 1873 Harwood, S., Esq. *Hamilton-house, Leamington.*
- 1879 Harwood,\* William, Esq. 31, *Lombard-street, E.C.; and Oriental Club, Hanover-square, W.*
- 1875 Haslam, Aug. Fred., Esq. 14, *Laun-road, Haverstock-hill, N.W.*
- 1873 Hatherton, Lord. *Teddesley-park, Penkridge, Staffordshire.*
- 1875 Havilland, Rev. C. R. de. *Iwer, near Uxbridge, Bucks.*
- 1858 Hawker, Edward J., Esq. 37, *Cadogan-place, S.W.*
- 1873 Hawker, Geo. C., Esq. *Care of A. Scott, Esq., Messrs. W. Jackson and Co., 6½ Austin Friars, E.C.*
- 1876 Hawkins, Alf. Templeton, Esq. 35, *Spring-gardens, S.W.*
- 1840 Hawkins,\* John, Esq.
- 1858 Hawkins,\* Lieut.-Gen. J. Summerfield, R.E. *St. Leonards, St. James's-rd., Malvern.*
- 1876 Hawkins, Rev. Joshua. *The Nest, Howard-road, South Norwood.*
- 1873 Hawkins, Rev. W. Bentinck L., F.R.S. 33, *Bryanston-square, W.*

Year of Election.		
1876		Hawshaw, * Sir John, C.E., F.R.S. 33, <i>Great George-street, S.W.</i>
1861		Hawksley, Thomas, Esq., C.E. 14, <i>Phillimore-gardens, Kensington, W.</i>
1877		Maxell, E. Nelson, Esq., F.G.S., <i>Netherlands. Lewgars, Kingsbury, Middlesex.</i>
1871		Hay, Andrew, Esq. <i>Oriental Club, Hanover-square, W.; and Bombay.</i>
1863		Hay, * Rear-Admiral Lord John, M.P., C.B. <i>Fulmer-place, Slough.</i>
1852	C.	Hay, * Rear-Admiral Sir J. C. Dalrymple, Bart., M.P., C.B., F.R.S. 108, <i>St. George's-square, S.W.; U. S. Club, S.W.; Dunragit, Glenluce; and Harrow-on-the-hill, N.W.</i>
1877	P.	Hay, Capt. J. S. (Inspector-General of Housa Forces). <i>Cape Coast Castle. Care of Sir Hector Hay, Bart., 2, Carlisle-place, Victoria-street, S.W.</i>
1872		Hay, Jno. Ogilvy, Esq. <i>Akyab, Arrakan, India.</i>
1865	C.	Hay, Lord William. 30, <i>Hertford-street, Mayfair, W.</i>
1872		Haydon, G. H., Esq. <i>Bethlehem Hospital, S.E.</i>
1874		Hayes, A. A., jun., Esq. <i>Care of Horace Farquhar, Esq., 9, King William-street, E.C.</i>
1870		Haynes, Stanley L., Esq., M.D. <i>Malvern-link, Worcestershire.</i>
1864		Haysman, James, Esq. <i>Burgess-hill, Finchley-road, N.W.</i>
1862		Head, Alfred, Esq. 13, <i>Craven-hill-gardens, Baywater, W.</i>
1871		Head, Henry, Esq. <i>Stoke Newington, N.</i>
1871		Head, Geo. T., Esq. <i>East-cliff-house Grammar-school, Margate.</i>
1876		Headley, Robert, Esq.
1878		Heane, * Lieut. Jas. L., R.N. <i>Care of Lloyds Banking Company, Newport, Salop.</i>
1863		Heathfield, W. E., Esq. 30, <i>King-street, St. James's.</i>
1878		Heaven, Rev. Charles, M.A. <i>The Vicarage, Horley, Banbury; and Beaconsfield Club, Castle-street, Birmingham.</i>
1861	P.	Hector, James, Esq., F.R.S., M.D. <i>Care of Agent-General for New Zealand, 7, Westminster-chambers, Victoria-street, S.W.</i>
1877		Hederstedt, Henry Burdett, Esq., C.E. 72, <i>Lancaster-gate, W.</i>
1873		Heeley, W. E., Esq. <i>Care of S. S. Geard and Son, 3, Guildhall-chambers, Basinghall-street, E.C.</i>
1876		Hegan, * Chas. John, Esq. <i>Oxford and Cambridge Club, Pall-mall, S.W.</i>
1871		Heinemann, N., Esq., PH.D. 47, <i>Upper Gloucester-place, Portman-square, W.</i>
1872		Helme, * Richard, Esq. <i>Walthamstow, Essex.</i>
1871		Henderson, * G., Esq., M.D., F.L.S. <i>Care of Messrs. King and Co., Pall-mall, S.W.</i>
1874		Henderson, Henry, Esq. 24, <i>Huntley-road, Elm-park, Liverpool.</i>
1853		Henderson, John, Esq. 2, <i>Arlington-street, Piccadilly, W.</i>
1874		Henderson, Major K. G. <i>Care of Sir C. McGrigor, Bart., and Co., 25, Charles-street, S.W.; and Naval and Military Club, Piccadilly, W.</i>
1866		Henderson, Patrick, Esq. <i>Care of George Reid, Esq., 11, Crooked-lane, E.C.</i>
1876		Henderson, * P. L., Esq. 14, <i>Fenchurch-street, E.C.</i>
1875		Heneage, Charles, Esq. <i>St. James's Club, Piccadilly, W.</i>
1844		Heneage, * Edward, Esq. <i>Stag's-end, Hemel Hempstead.</i>
1860		Hennessey, J. B. N., Esq. (1st Asst. Trig. Survey of India). <i>Dehra Dhoon. Care of Messrs. H. S. King and Co., Cornhill, E.C.</i>



Year of  
Election.

- 1875 Henriques, Alfred G., Esq. 96, Gloucester-terrace, Hyde-park, W.
- 1838 Henry,\* Wm. Chas., Esq., M.D., F.R.S. *Hafield, near Ledbury, Herefordshire.*
- 1861 Henty,\* Douglas, Esq. *Chichester.*
- 1872 Herbert, Charles E., Esq.
- 1875 Herbert, H. Aug., Esq. *Care of Messrs. H. S. King & Co., 45, Pall-mall, S.W.*
- 1876 Herries, Edward, Esq., C.B. *Athenæum Club, Pall-mall, S.W.*
- 1858 Hertalet, Sir Edward, C.B. *Librarian, Foreign-office, S.W.; and Belle-vue-house, Richmond.*
- 1871 Hertalet, Geo. Thos., Esq. *Lord Chamberlain's-office, St. James's-palace, S.W.*
- 1876 Hervey, Lord Francis, M.P. 3, *Spring-gardens, S.W.*
- 1877 Herz,\* Dr. Cornelius. *San Francisco. Care of W. F. A. Archibald, Esq., 8, Fig-tree-court, Temple, E.C.*
- 1877 Hetherington, J. Newby, Esq. 62, *Harley-street, W.*
- 1861 Heugh, John, Esq. *The Manor, Sidmouth, Devon.*
- 1873 Hewitt, Richard, Esq. *Elmsfield, Esher, Surrey.*
- 1840 Heywood,\* James, Esq., F.R.S. *Athenæum Club, S.W.; and 26, Kensington-palace-gardens, W.*
- 1869 Heywood, Samuel, Esq. 171, *Stanhope-street, Hampstead-road, N.W.*
- 1860 Heyworth, Capt. Lawrence. *Junior United Service Club, S.W.*
- 1878 Hickie, Daniel, Esq. *Nenagh, Co. Tipperary.*
- 1878 Hicks, Alfred, Esq. 74, *Great Russell-street, W.C.*
- 1867 Higgins, Edmund Thomas, Esq., M.B.C.S. 22, *Bloomsbury-street, E.C.*
- 1877 Hight, Capt. Edward. *Care of Messrs. F. Green & Co., 112, Fenchurch-street, E.C.*
- 1856 Hill, Arthur Bowdler, Esq. *South-road, Clapham-park, Surrey, S.W.*
- 1872 Hill, Clement L., Esq. *Foreign-office, S.W.*
- 1873 P. Hill, Henry, Esq. 122, *Leadenhall-street, E.C.*
- 1874 Hill, Capt. Jno., R.E. (*Great Trig. Survey of India*). *Dehra Dhoon.*
- 1872 Hill, Samuel, Esq., M.D. 22, *Mecklenburgh-square, W.C.*
- 1878 Hill, Samuel Thomas, Esq. *Mile End Commercial-schools, Stepney-green, E.*
- 1854 Hill, Colonel Sir Stephen J., K.C.M.G., C.B. *Army and Navy Club, S.W. Droxford, Bishops Waltham, Hants.*
- 1874 Hills, Major-General James, V.C., R.A., C.B. *Care of Messrs. H. S. King and Co., Cornhill, E.C.*
- 1858 Hinchliff, T. Woodbine, Esq. 64, *Lincoln's-inn-fields, W.C.*
- 1862 Hinde,\* Samuel Henry, Esq. *Windham Club, S.W.*
- 1878 Hippisley, Alfred Edward, Esq. 8, *Storey's-gate, S.W.; and Thatched-House Club, St. James's-street, S.W.*
- 1873 Hirst, William Henry, Esq. 103, *Mottram-road, Staleybridge, Cheshire.*
- 1873 Hirth,\* Dr. F. *Imperial Maritime Customs, China; and 8, Storey's-gate, S.W.*
- 1870 Hitchins, Capt. T. M., R.A. 34, *Edge-lane, Liverpool.*
- 1872 Hoare,\* Henry, Esq. *Messrs. Hoare's Bank, Fleet-street; and St. James's-square, S.W.*

Year of  
Election.

- 1868 Hoare, Samuel, Esq. 7, *Hereford-gardens, Park-lane, W.*
- 1876 Hobart, Major Bertie, R.A. *Care of R. N. Cust, Esq., 64, St. George's-square, S.W.*
- 1876 Hobson, Rev. J. P., M.A. *The Vicarage, Stanstead Abbots, Herts.*
- 1868 Hobson, Stephen James, Esq. 10, *Regent's-park-road, N.W.*
- 1874 Hochschild,\* His Excellency Baron. 47, *Charles-street, Berkeley-square, W.*
- 1872 Hockin, Charles, Esq., M.A. 8, *Avenue-road, St. John's-wood, N.W.*
- 1875 Hodge, Edward W., Esq., F.R.S., *Netherlands. 4, Langham-place, W.*
- 1869 Hodges, Henry, Esq. *Brondesbury-lodge Collegiate-school, Kilburn.*
- 1856 Hodgson,\* Arthur, Esq. *Clapton-house, near Stratford-on-Avon.*
- 1871 Hodgson, Henry Tylston, Esq. *Harpenden, St. Albans.*
- 1861 Hodgson,\* James Stewart, Esq. 24, *Prince's-gardens, S.W.*
- 1857 Hodgson, Kirkman Daniel, Esq., M.P. 8, *Bishopsgate-street, E.C.*
- 1869 Hodgson,\* William H., Esq. *The Hill, Carlisle.*
- 1868 P. Holdich, Capt. Thos. Hungerford, R.E. 24, *Colville-square, Bayswater.*
- 1839 Holford,\* Robert S., Esq. *Dorchester-house, Park-lane, W.*
- 1867 P. Holland, Rev. Fred. Whitmore. *Evesham, Worcester.*
- 1861 Holland, Colonel James. *Southside, The Park, Upper Norwood, S.E.*
- 1873 Holland, Lieut. Swinton C., R.N. *Care of Messrs. Hildreth and Woodhead, 44, Charing-cross, S.W.*
- 1875 Hollebone,\* Fredk., Esq. *Ravensbourne-park, Catford-bridge, S.E.*
- 1871 Hollingworth,\* Hy. Geo., Esq. 11, *Billiter-square, E.C.; and 56, Hereford-road, Bayswater, W.*
- 1876 Holliat,\* Major E. O., R.A. *Queen's-hotel, Queenstown.*
- 1861 Holme, J. Wilson, Esq., M.A. 83, *St. George's-square, S.W.*
- 1876 Holmes, John, Esq. 9, *Norfolk-road, St. John's-wood.*
- 1874 Holmwood, T. D., Esq., 7, *Church-terrace, Lee, Kent.*
- 1839 P. Holroyd,\* Arthur Todd, Esq., M.D., F.R.S. *Master's-office, Sydney, New South Wales. Care of Edgar Howell, Esq., 3, St. Paul's-churchyard, E.C.*
- 1857 Holroyd, Henry, Esq. 14, *Kensington-gardens-terrace, W.*
- 1867 Holstein, The Marquez de Souza. *Lisbon. Care of the Portuguese Legation, 12, Gloucester-place, Portman-square, W.*
- 1869 Holt, George, Esq. *Union-street, Willenhall.*
- 1871 Holt, Henry F. W., Esq. *Redgrave, Victoria-road, Clapham-common, S.W.; and care of Messrs. King and Co., Cornhill, E.C.*
- 1872 Holt, Lieut. Sydney A., R.N.
- 1864 Holt, Vesey, Esq. 17, *Whitehall-place, S.W.*
- 1857 Homfray, William Henry, Esq. 6, *Storey's-gate, S.W.*
- 1875 Honeybourne, Jno. W. C., Esq. *St. Ives Grammar-school, Huntingdonshire.*
- 1864 Hood, Sir Alex. Acland, Bart. *St. Andrie's-park, Bridgewater, Somerset.*
- 1873 Hood,\* F. Jacomb, Esq. *Conservative Club, S.W.*
- 1866 P. Hooker,\* Sir Joseph, K.C.S.I., C.B., M.D., F.R.S., F.L.S., &c. *Director of the Royal Gardens, Kew.*



Year of  
Election.

- 1868 Hooper, Alf., Esq. *City of London Club, Old Broad-street, E.C.*
- 1870 Hooper, George Norgate, Esq. 139, *King Henry's-road, Adelaide-road, N.W.*
- 1870 Hooper, Rev. Robert Poole. 31, *Cambridge-road, Brighton.*
- 1875 Hooper, Wm. Edwd. Parry, Esq. 29, *St. George's-road, Kilburn, N.W.; and 17, New-street, Spring-gardens, S.W.*
- 1875 Hooper, W. F., Esq. *Care of Mrs. Hugh Rees, Church-street, Carnarvon.*
- 1861 Hopcraft, George, Esq. 3, *Billiter-square, E.C.*
- 1846 C. Hope,\* Alex. James Beresford, Esq., M.P. *Arklow-house, Connaught-place, Hyde-park, W.; and Bedgebury-park, Hurst-green, Kent.*
- 1869 Hopkins, Capt. David, M.A.I. (H.M. Consul, *St. Paulo de Loanda*). *Care of Mrs. Hopkins, Richmond-villa, Lordship-lane, Dulwich, S.E.*
- 1870 Hopkins,\* Edward M., Esq.
- 1871 Hornby, Rev. James John, D.D. *Head Master of Eton College.*
- 1877 Horncastle, W. Geo., Esq. *The Acacias, Upper Clapton.*
- 1871 Horne, Francis, G. Esq. *Salmons, Caterham, Surrey.*
- 1876 Horniman,\* Fred. Jno., Esq. *Surrey-house, Forest-hill.*
- 1869 Horrex, Theophilus, Esq. 18, *Connaught-square, Hyde-park, W.*
- 1876 Horsley, Thomas, Esq. *King's Newton, Derbyshire.*
- 1868 Horton, James Africanus B., Esq., M.D., &c. *Care of Sir C. McGrigor, Bart., and Co., Charles-street, St. James's, S.W.*
- 1861 Hoskins, Capt. A. H., R.N. *Army and Navy Club, S.W. Care of Messrs. Woodhead, 44, Charing-cross, S.W.*
- 1877 Hoskold, Henry Davis, Esq., C.E.
- 1853 C. Houghton, Lord, D.C.L., F.R.S. *Travellers' Club, S.W.; The Hall, Bawtry; and Frystone-hall, Ferrybridge, Yorkshire.*
- 1878 Hounsell, William, Esq., J.P. *Mountfield, Bridport, Dorset.*
- 1874 Howard, A. C., Esq. 27, *Devonshire-place, Portland-place, W.; and Arthur's Club, S.W.*
- 1876 Howard, Charles C., Esq. *Christchurch, Canterbury, New Zealand. Care of Mr. E. Stanford, Charing-cross, S.W.*
- 1869 Howard, John, Esq., C.E. *Heavitree-park, Exeter, Devon.*
- 1875 Howard, Joseph, Esq. *Tottenham-green.*
- 1873 Howard, Morgan, Esq., Q.C. *Temple, E.C.*
- 1857 Howard, Samuel Lloyd, Esq. *Goldings, Loughton, Essex.*
- 1873 Howard, William, Esq. 3, *Roslyn-bank, Lyndhurst-road, Hampstead, N.W.*
- 1875 Hozier, Major Jno. W. (Scots Greys). 11, *Hobart-place, Eaton-square, S.W.*
- 1842 Hubbard,\* Rt. Hon. J. Gellibrand, M.P. 24, *Prince's-gate, Hyde-park, W.*
- 1867 Hubbard,\* William Egerton, Esq. *Leonardslee, Horsham.*
- 1867 Hubbard,\* William Egerton, jun., Esq. *Leonardslee, Horsham.*
- 1871 Hudleston,\* Wilfred, Esq. 23, *Cheyne-walk, S.W.*
- 1870 Hudson, George B., Esq. *Frogmore-hall, Hertford; and New University Club, St. James's-street, S.W.*
- 1872 Hudson,\* John, Esq. *Clyde-house, Redhill, Surrey.*
- 1876 Hughes, A. W., Esq. *Care of F. P. Baker, Esq., 4, Bond-court, Walbrook, E.C.*

Year of Election.	
1857	Hughes, Captain Sir Frederic. <i>Pole, Hole, Wexford.</i>
1875	Hughes, J. Wm., Esq. <i>Bangor, Carnarvonshire.</i>
1873	Hughes, James, Esq. 328, <i>Camden-road, N.</i>
1876	Hughes, Joseph, Esq. <i>Lambourn-lodge, South-cote, Upper Norwood, S.E.</i>
1877	Hughes, Pringle, Esq. <i>Middleton-hall, Wooler, Northumberland.</i>
1875	Hughes, Capt. W. Gwynne. 14, <i>St. James's-square, S.W.</i>
1865	Hughes-Hallett, Major. <i>Junior United Service Club, S.W.</i>
1875	Hull, Staff-Comm. Thos. A., R.N. <i>Hydrographic-office, Admiralty, S.W.</i>
1838	Hume, * Edmund Kent, Esq.
1877	Hume, Lieut.-Colonel Gustavus. 115, <i>St. George's-square, S.W.</i>
1873	Hunt, John, Esq. 22, <i>Lancaster-gate, Hyde-park, W.</i>
1877	Hunt, W. G. Francis, Esq., R.N. 8, <i>Duke-street, St. James's; and Naval and Military Club, Piccadilly, W.</i>
1874	Hunt, William Thomas, Esq. 1, <i>Pembridge-villas, Bayswater, W.</i>
1876	Hunter, Major F. M. (Bombay Staff Corps). <i>Aden, 60, South-street, St. Andrew's, Fifeshire. Care of Messrs. H. S. King and Co., Cornhill, E.C.</i>
1875	Hunter, John, Esq. 9, <i>New-square, Lincoln's-inn, W.C.</i>
1874	Hunter, Capt. J. Edward, R.N. 26, <i>Leyland-road, Southport.</i>
1872	Hunter, W. W., Esq., B.A., LL.D. 9, <i>Douglas-crescent, Edinburgh.</i>
1876	Huntingford, * Lieut. G., R.N. <i>Care of Rev. Dr. Huntingford, Valley-end, Bagshot, Surrey.</i>
1877	Husband, John, Esq. <i>Goulton-road, Clapton.</i>
1872	Huson-More, James, Esq., M.A. 2, <i>Brook-street, Cheetham, Manchester.</i>
1871	Hutchins, F. Leigh, Esq. 22, <i>Queen's-gardens, Hyde-park, S.W.</i>
1873	Hutchins, Geo. Albert, Esq. <i>Felsted Pen, Spanish Town, Jamaica.</i>
1871	Hutchinson, * Colonel Alexr. Hadden, R.A., F.G.S. <i>Tenby, S. Wales.</i>
1872	p. Hutchinson, Edward, Esq. 8, <i>Summer-place, South Kensington, S.W.</i>
1864	Hutchinson, Capt. R. R. <i>Verulam Club, 54, St. James's-street, S.W.</i>
1877	Hutchison, John W., Esq. <i>Balinaghie, Castle Douglas, N. B.; and Conservative Club, S.W.</i>
1874	Hyndman, Hy. Mayers, Esq. 10, <i>Devonshire-street, Portland-place, W.</i>
1870	Hutton, * Charles W. C., Esq. <i>Belair, Dulwich, S.E.</i>
1869	C. Huxley, Prof. T. H., F.R.S. 4, <i>Marlborough-place, St. John's-wood, N.W.; and 28, Jermyn-street, S.W.</i>
1860	Hyde, * Captain Samuel.
1852	Illingworth, Richard Stonhewer, Esq. 9, <i>Norfolk-crescent, Hyde-park, W.</i>
1875	Impey-Lovibond, Col. Archibald, R.E. <i>"Rifhams," Danbury, near Chelmsford, Essex.</i>
1850	Imray, * James Frederick, Esq. 89, <i>Minories, E.; and Beckenham, Kent.</i>
1878	Ince, Thomas Henry, Esq., F.Z.S. <i>Eltham-lodge, 191, Maida-vale, N.W.</i>



Year of Election.	
1861	Ingall,* Samuel, Esq. <i>Forest-hill, Kent, S.E.</i>
1851	Gr. C. p. Inglefield, Admiral Sir Edward A., C.B., F.R.S. <i>United Service Club, S.W.</i>
1846	Ingram, Hughes Francis, Esq. <i>University Club, S.W.</i>
1860	Inskip,* Capt. G. H., R.N. 1, <i>Huntiscombe-place, North-road, Plymouth.</i>
1852	Inskip,* Rev. Robert Mills, C.B. 1, <i>Huntiscombe-place, North-road, Plymouth.</i>
1877	Inverarity, Geo., Esq. 13, <i>Stanhope-gardens, S.W.</i>
1875	Inverurie, Lord. <i>Guthrie Castle, Arbroath; and Carlton Club, Pall-mall.</i>
1870	Irvine, James, Esq. 18, <i>Devonshire-road, Cloughton, Cheshire.</i>
1864	Irving,* John, Esq. <i>Care of Messrs. Ebacorth and Sons, 4, Corbet-court, Gracechurch-street, E.C.</i>
1861	Irwin, James V. H., Esq. 13, <i>Henstridge-villas, St. John's-wood, N.W.</i>
1877	Ibbister, William, Esq. 56, <i>Ludgate-hill, E.C.</i>
1879	Isaacson,* F. Wootton, Esq. 152, <i>Harley-street, W.</i>
1877	Jack, R. L., Esq. <i>Care of William Jack, Esq., 19, Lansdowne-road, Notting-hill, W.</i>
1873	Jackson, F. H. Ward, Esq. 9, <i>Albion-street, Hyde-park, W.</i>
1871	Jackson, Henry, Esq., Lieut. late I.N. (Chief Surveyor of the Province of Wellington). <i>New Zealand.</i>
1871	Jackson, Richd. Belgrave, Esq. 10, <i>Leonard-place, Kensington, W.</i>
1866	Jackson, Robert Ward, Esq. 136, <i>Inverness-terrace, Hyde-park, W.</i>
1871	Jackson, Thos. Hughes, Esq. <i>Manor-house, Birkenhead.</i>
1855	Jackson, William, Esq. 44, <i>Portland-place, W.</i>
1871	Jackson, Wm. Chas., Esq. 9, <i>Bucklersbury, E.C.</i>
1862	Jacomb, Thomas, jun., Esq. <i>Woodend, Hollington, St. Leonards-on-Sea.</i>
1875	Jagg, Rev. F. Charles. <i>Luddenham-rectory, Faversham, Kent.</i>
1878	Jago,* Lieut.-Colonel John. <i>Penang. Care of Messrs. Cox and Co., Craig's-court, S.W.</i>
1877	James, Walter Knight, Esq. <i>Normal College, Colombo, Ceylon; and 22, Pelham-street, Nottingham.</i>
1870	James, William Morris, Esq. 8, <i>Lyndhurst-road, Hampstead, N.W.</i>
1878	Jamieson, Capt. A. Wm. (Bengal Staff Corps). <i>Oakhill, near Bath.</i>
1868	Jamieson, Hugh, Esq. <i>Junior Carlton Club, S.W.</i>
1877	Janvrin, A. F., Esq. 49, <i>Pall-mall, S.W.</i>
1862	Jaques,* Leonard, Esq. <i>Wentbridge-house, Pontefract, Yorkshire.</i>
1863	Jardine,* Andrew, Esq. <i>Lanrick-castle, Stirling.</i>
1863	Jardine,* Robert, Esq. <i>Castlemilk, Lockerby, N.B.</i>
1875	Jardine,* Robert, Esq. 21, <i>Queensbury-place, South Kensington, S.W.</i>
1871	Jarrad, Lieut. F. W., R.N. <i>Care of Edw. M. Roe, Esq., Royal Hospital Schools, Greenwich.</i>
1876	Jeakes, Rev. James. 54, <i>Argyll-road, Kensington, W.</i>

Year of Election.		
1872	P.	Jeffreys, A. F., Esq. <i>Landford-house, Downton, Salisbury; and 1, Dr. Johnson's-buildings, Temple, E.C.</i>
1865		Jeffreys, J. Gwyn, Esq., LL.D., F.R.S. <i>Ware-priory, Herts.</i>
1876		Jeffries, Wm. H., Esq. 111, <i>Southgate-road, Islington, N.</i>
1875		Jeffs, Richard, Esq. 244, <i>Regent-street, W.</i>
1854		Jellicoe, Charles, Esq. 12, <i>Cavendish-place, W.</i>
1837		Jenkins, * R. Castle, Esq. <i>Beachley, near Chepstow.</i>
1877		Jenkins, Commander R. P., R.N. 2, <i>Cambridge-villas, Oakfield-road, Croydon.</i>
1874		Jenkinson, * H. Irwin, Esq. <i>Kewick, Cumberland.</i>
1875		Jennings, Samuel, jun., Esq. 58, <i>Granville-park, Blackheath.</i>
1854		Jennings, * William, Esq., M.A. 13, <i>Victoria-street, Westminster, S.W.</i>
1876		Jephson, Mountney, Esq. <i>Garrick Club, Garrick-street, W.C.</i>
1874	P.	Jeppe, Le Chevalier Fred. <i>Care of Portuguese Consulate, 10, St. Mary-Axe, E.C.</i>
1860		Jermyn, Rowland Formby, Esq. <i>War-office, S.W.</i>
1878		Jervois, Major-General Sir W. Drummond, C.B., G.C.M.G. ( <i>Governor of South Australia</i> ).
1873		Jervis, Theodore, Esq. 19, <i>Clarendon-street, Belgravia, S.W.</i>
1870		Jessop, Captain Thomas. <i>Honley, Huddersfield.</i>
1860		Jessopp, Rev. Augustus, M.A., Head Master, King Edward VI. School. <i>Norwich.</i>
1864		Jeula, * Henry, Esq. <i>Lloyd's, E.C.</i>
1874		Jeune, Fras. H., Esq. 140, <i>Cromwell-road, S.W.</i>
1878		Jinman, George, Esq. <i>Carisbrooke, Forest-hill, S.E.</i>
1876		Joaquim, J. P., Esq. <i>Care of W. B. D'Almeida, Esq., 2, Pump-court, Middle-Temple, E.C.</i>
1873		Jocelyn, Hon. W. Nassau. <i>Care of Foreign-office, S.W.</i>
1876		Johnson, F. Bulkeley, Esq. 5, <i>The Mount, St. Leonards-on-Sea; and Decon-shire Club, St. James's-street, S.W.</i>
1876		Johnson, Joseph, Esq. 12, <i>Carleton-road, Tufnell-park, N.</i>
1876		Johnson, Murray, Esq. 20, <i>Austin Friars, E.C.</i>
1866	T. p.	Johnson, W. H., Esq. (Civil Assistant G. T. S. India).
1875		Johnston, * A., Esq. 18, <i>Puternoster-row, E.C.</i>
1876		Johnston, Chas. Edwd., Esq. 10, <i>Hyde-park-gate, Kensington, S.W.</i>
1878		Johnston, Geo., Esq., M.D. 15, <i>St. Stephen's-green, Dublin.</i>
1874		Johnston, * Capt. H. B. <i>United Service Club, Dublin; and Junior Carlton Club, Pall-mall, S.W.</i>
1857		Johnston, J. Brookes, Esq.
1875		Johnston, Robert, Esq. 2, <i>Gardiner's-row, Dublin.</i>
1871		Johnston, T. B., Esq., F.R.S.E. 16, <i>South St. Andrew-street, Edinburgh.</i>
1866		Johnstone, Colonel H. C., C.B., F.R.A.S. <i>Murree, Punjab, India. Care of Messrs. H. S. King and Co., Cornhill, E.C.</i>
1867		Johnstone, * John, Esq. <i>Castellum-house, Mortlake, S.W.</i>
1874		Johnstone, M. Butler, Esq., M.P. 8, <i>Seamore-place, Mayfair, W.</i>
1873		Johnstone, W. Woods, Esq., M.D. 44, <i>Prince's-square, W.</i>



Year of Election.

- 1872 Jolley, Rev. William Rowe, M.A., Hon. Chaplain to the Queen. *St. John's Parsonage, Birkenhead.*
- 1875 Jones, Arthur W., Esq. 10, *Eaton-square, S.W.*
- 1874 Jones, Edwin, Esq. *Fairlea, Bassett, Southampton.*
- 1876 Jones, Hugh H., Esq. *Larkhill, Liverpool.*
- 1868 Jones, Capt. H. M., V.C. *Care of Messrs. Bickers & Son, 1, Leicester-square, W.C.*
- 1857 Jones, Major-General Jenkin, R.N. 44, *Holland-street, Kensington, W.*
- 1862 Jones, John, Esq. 338, *Strand, W.C.*
- 1873 Jones, Rev. John.
- 1872 Jones, Staff-Commander Jno., R.N. *The Blue Bell, Welshpool, Montgomeryshire.*
- 1878 Jones, John James, Esq. 25, *College-avenue, Urswick-road, Lower Clapton, E.*
- 1878 Jones, Major R. Owen, R.E. *Ordnance Survey-office, 46, St. George's-road, S.W.*
- 1876 Jones, \* R. T., Esq. 1, *St. Alban's-road, Highgate-hill, N.*
- 1876 Jones, \* Thomas M. Rymer, Esq., C.E., Japan. *Care of T. R. Jones, Esq., 52, Cornwall-road, Westbourne-park, W.*
- 1861 Jones, Rev. W. Taylor, M.A. *The College, Sydenham.*
- 1878 Jones, Sir Willoughby, Bart. *Cranmer-hall, Fakenham, Norfolk.*
- 1873 Jones, Winslow, Esq. *Devon and Exeter Institution, Exeter.*
- 1878 Jones, W. J. Esq. *Buckingham.*
- 1878 Jopp, Capt. A. Abercrombie, R.E. 18, *Tregunter-road, South Kensington, S.W.*
- 1867 Jordan, \* Wm. Leighton, Esq. *Care of Dr. Wallich, 162, Holland-road, Kensington, W.*
- 1863 Joshua, \* Moss, Esq. *Bishopshalt, Hillingdon.*
- 1876 Joyner, \* Henry Batson, Esq., C.E. *Yamato Yashiki, Tokai, Japan. Care of H. S. J. Joyner, Esq., Northwick-house, Harrow.*
- 1878 Joyner, Robert Batson, Esq. *Care of Messrs. Wheatley & Co., 156, Leadenhall-street, E.C.*
- 1878 Jupe, \* Jno., Esq. *Lloyd's, E.C.*
- 1876 Kane, Dr. Matthew, M.D. *Lanherne, Kingston-hill.*
- 1873 Kane, Dr. William. *Care of M. Kane, Esq., M.D., Lanherne, Kingston-hill.*
- 1868 Kantzow, Admiral H. P. de. 1, *Observatory-gardens, Campden-hill-road, W.*
- 1877 Karuth, Frank Oscar, Esq. *Oakhurst, The Knoll, Beckenham, Kent.*
- 1875 Kavanagh, T. Frank P., Esq.
- 1858 Kay, David, Esq. 19, *Upper Phillimore-place, Kensington, W.*
- 1876 Kay, H. C., Esq. 11, *Durham-villas, Kensington, W.*
- 1877 Keane, Richard F., Esq., C.E. *Derriheen-house, Cappoquin, Ireland.*
- 1857 Keating, Right Hon. Sir Henry Singer. 11, *Prince's-gardens, S.W.*
- 1879 Keeling, Frederic John, Esq. *St. Mary's-terrace, Colchester.*
- 1873 Keightley, \* Alfred D., Esq. *Milnthorpe, Penrith, Westmoreland.*
- 1875 Keir, Campbell M., Esq. *Oriental Club, Hanover-square, W.*

Year of Election.	
1875	Keir, Jno. Lindsay, Esq. <i>Fordlands, Bideford.</i>
1864	Keir, Simon, Esq. <i>Conservative Club, S.W.</i>
1879	Kell, Robert, Esq. 53, <i>Devonshire-street, W.</i> ; and <i>Wanderers' Club, S.W.</i>
1860	Kemball,* Lieut.-Gen. Sir Arnold Burrowes, K.C.B., K.C.S.I. <i>United Service Club, S.W.</i> ; and 79, <i>Queen's-gate, S.W.</i>
1869	Kemp, Geo. L., Esq., <i>Calcutta. Care of Messrs. H. S. King and Co., 65, Cornhill, E.C.</i>
1873	Kemp, Rev. Henry William, B.A. <i>The Charter-house, Hull.</i>
1863	Kempster, J., Esq. 1, <i>Portsmouth-place, Kennington-lane, Surrey, S.E.</i>
1878	Kendall, James, Esq. 16, <i>Park-road, Wandsworth-common, S.W.</i>
1861	Kennard, Adam Steinmetz, Esq. <i>Crawley-court, Winchester.</i>
1877	Kennard, James, Esq. <i>Morton-house, Middleton, Lancashire.</i>
1877	C. Kennaway,* Sir John H., Bart. <i>Escot, Ottery St. Mary, Devon.</i>
1871	Kennedy, Henry Hyndham, Esq. <i>Union Club, S.W.</i>
1875	Kennedy, John, Esq. 13, <i>Brooklyn-road, Shepherd's-bush, W.</i>
1854	Kennedy, Rev. John, M.A. 27, <i>Stepney-green, E.</i>
1875	Kennedy, Rear-Admiral Jno. Jas., C.B. 1, <i>Cromwell-place, South Kensington, S.W.</i> ; and <i>United Service Club, Pall-mall.</i>
1871	Kennion, Rev. George Wyndham, B.A. <i>All Saints'-vicarage, Bradford, Yorkshire.</i>
1875	Kent, Fras. A., Esq. <i>Kesgrave-hall, Suffolk.</i>
1872	Kerr, Alexander, Esq., <i>Wellington, New Zealand. Care of Norman S. Kerr, Esq., M.D., 42, Grove-road, St. John's-wood, N.W.</i>
1874	Kerr, Major-General Lord Mark, C.B. 2, <i>Lower Grosvenor-place, S.W.</i>
1862	Kershaw, Wm., Esq. 16, <i>St. Mary-Axe, E.C.</i> ; and <i>Suffolk-lodge, Eriston-road, S.W.</i>
1875	Kettle,* Daniel W., Esq. <i>Hayes-common, Beckenham</i> ; and 53, <i>Fleet-street, E.C.</i>
1876	Kettle,* H. A., Esq. <i>Hayes-common, Beckenham, Kent.</i>
1879	Key, Admiral Sir Astley Cooper, K.C.B. 5, <i>Cranley-place, S.W.</i> ; and <i>United Service Club, Pall-mall, S.W.</i>
1857	Keysell, Francis P., Esq. <i>Grove-house, Cheshunt.</i>
1864	Kiddle,* Staff-Commr. W. W., R.N. 70, <i>Upper Leeson-street, Dublin.</i>
1878	Kilgour, Geo., Esq.
1878	Kilham, Thomas, Esq. <i>Upper Grosvenor-road, Tunbridge Wells.</i>
1874	Killam, Frank, Esq. <i>Yarmouth, Nova Scotia. Care of Messrs. T. C. Jones and Co., 26, Chapel-street, Liverpool.</i>
1864	Kimber, Dr. E. 13, <i>Park-villas, Shepherd's-bush, W.</i>
1874	Kincaid, Thomas, Esq. 9, <i>Lansdown-crescent, Glasgow.</i>
1879	King, Edward, Esq. 1, <i>Eleaston-place, Queen's-gate, S.W.</i>
1875	King, E. H., Esq. <i>Killoct, Godalming, Surrey.</i>
1846	King, Lieut.-Colonel Edward R. <i>Junior United Service Club, S.W.</i>
1872	King, James, Esq. 12, <i>Claremont-terrace, Glasgow.</i>
1866	King, John, Esq. <i>Compton-field-place, Guildford, Surrey.</i>



Year of Election.		
1874	•	King, Hon. J. P. Locke. 38, <i>Dover-street, W.</i> ; and <i>Brooklands, near Weybridge, Surrey.</i>
1877		King, Joseph, Esq. <i>Arkwright-road, Hampstead, N. W.</i>
1873		Kingsley,* Maurice, Esq. <i>Care of Mrs. Kingsley, Byfleet, Weybridge.</i>
1857		Kinnaird,* Arthur F., Lord, 2, <i>Pall-mall East, S. W.</i>
1878		Kirby, William, Esq. 18, <i>John-Street, West-cliff, Whitby, Yorkshire.</i>
1858	C. p.	Kirk, John, Esq. M.D. (H.M. Agent and Consul General, Zanzibar).
1863		Kirke, John, Esq. <i>Oriental Club, W.</i>
1870		Kirkland, Major-Gen. John A. Vesey. <i>Wester Fordel, Milnathort, N. B.</i>
1868		Kisch, Daniel Montagu, Esq. 15, <i>Westbourne-park-terrace, W.</i>
1875		Kitchener, Lieut. H. H.
1866		Kitson,* James, jun., Esq. <i>Spring-bank, Headingley, Leeds.</i>
1868		Kitto, Richard L. Middleton, Esq. <i>Preston-lodge, Prestonpans, N. B.</i>
1867		Knight, Andrew Halley, Esq. 62, <i>Holland-park, W.</i>
1876		Knight, Wm. Duncan, Esq. <i>Avening-house, Greenhill-park, Hampstead.</i>
1862		Knollys, General Rt. Hon. Sir William T., K.C.B. <i>Blount's-court, Henley-on-Thames.</i>
1871		Knollys, Lieut.-Col. W. W. (93rd Highlanders). 102, <i>Belgrave-road, S. W.</i>
1874		Knowles, George, Esq., C.E. <i>Billiter-house, Billiter-street, E.C.</i>
1867		Knox, Alex. A., Esq. 91, <i>Victoria-street, Westminster, S. W.</i>
1861		Knox, Thomas G., Esq. (H. M. Consul General, Siam). <i>Care of Messrs. H. S. King and Co., 45, Pall-mall, S. W.</i>
1874		Koppel, S., Esq.
1866	p.	Kopsch, Henry, Esq. <i>Imperial Maritime Customs, China; and 8, Storey's-gate, S. W.</i>
1876		Kurnalkur, Abdul Hakk (Extra Assist.-Commissioner, Basim, Berar, India).
1861		Kyd, Hayes, Esq., M.R.C.S. <i>Wadebridge, Cornwall.</i>
1875		Kynaston, Rev. Herbert. <i>Montpellier-lodge, Cheltenham.</i>
1859		Labrow, Lieut.-Colonel Valentine H., F.S.A., F.G.S. <i>Mitre-court-chambers, Temple, E.C.</i> ; and <i>Club-chambers, S. W.</i>
1849		Laffan,* Maj.-Gen. Sir Robert Michael, R.E., K.C.M.G. <i>Army and Navy Club, S. W.</i>
1876		Lafone, Alfred W., Esq. <i>The Elms, Halton.</i>
1870		Laing, Arthur, Esq. 29, <i>Mincing-lane, E.C.</i>
1875		Laing, Joseph, Esq. 17, <i>Castelnau-villas, Barnes, S. W.</i>
1877		Laing, Robert A., Esq. 3, <i>St. Peter's-road, Croydon.</i>
1877		Laing, Seton, Esq. 3, <i>Observatory-gardens, Campden-hill, Kensington, W.</i> ; and <i>Reform Club, Pall-mall, S. W.</i>
1878		L'Aker, John, Esq. <i>Hever-lodge, Maidstone.</i>
1869	p.	Lamb, Hon. Edward William. <i>Brisbane, Queensland, Australia.</i>
1859		Lamb, Lieut. Henry, I.N. <i>H.M. India Store Department, Belvedere-road, Lambeth, S.E.</i>
1863		Lambert,* Alan, Esq. <i>Heath-lodge, Putney-heath, S. W.</i>

Year of Election.	
1877	Lambert,* C. J., Esq. 1, Crosby-square, E.C.
1875	Lambert,* Cowley, Esq. New University Club, St. James's-street, S.W.
1878	Lambert, Rev. Frederick Charles. Arundel-house, West-hill, Sydenham.
1876	Laming, James, Esq.
1861	Lamont, James, Esq. 4, Queen-street, Mayfair, W.
1870	Lamplough, Charles Edward, Esq. City of London Club, E.C.
1866	Lampray, John, Esq. 16, Camden-square, N.W.
1864	Lampson, Sir C. M., Bart. 80, Eaton-square, S.W.
1859	Lange,* Sir Daniel A. Lanehurst, Albourne, Sussex.
1856	Langler,* John R., Esq., B.A. Broxholme, Thurlow-hill, Lower Norwood, S.E.
1871	Langworthy, Edward, Esq.
1876	Lansdell,* Rev. Henry. The Grove, Blackheath, S.E.
1861	Lardner, Colonel John. United Service Club, S.W.
1873	Large, Robert Emmott, Esq. The Elms, Portsmouth-road, Surbiton; and 13 South-square, Gray's-inn, W.C.
1859	Larnach, Donald, Esq. 21, Kensington-palace-gardens, W.
1870	Lasseter, Frederic, Esq. 5, Porchester-gate, Hyde-park, W.
1870	Laughton, Lieut.-Col. George Arnold (Bombay Staff Corps), Superintendent Bombay Survey, Bombay.
1869	Laughton, J. K., Esq. Royal Naval College, Greenwich.
1876	Laurie,* Peter Geo., Esq. 9, Arundel-gardens, Kensington-park, W.; Sulhamstead Abbots, near Reading, Berks; and Thatched-House Club, St. James's-street, S.W.
1876	Lavies, Joseph Samuel, Esq. 96, St. George's-road, S.W.
1873	Law, Geo., Esq. 544, Oxford-street, W.C.
1846	Law,* Hon. H. Spencer, M.A. 36, Eccleston-square, S.W.
1873	Law, Jas., Esq. 544, Oxford-street, W.C.
1874	Lawes,* Robert Murray, Esq. 9, Clarges-street, Piccadilly, W.
1870	Lawrence, Alexander, Esq. Clyde-house, Thurlow-road, Hampstead, N.W.; and Windsor-chambers, Great St. Helen's, E.C.
1876	Lawrence, A. M., Esq., jun. 17, Thurlow-road, Hampstead, N.W.
1874	Lawrence, Fred. W., Esq. Oakleigh, Beckenham, Kent.
1876	Lawrence, Lord. 34, Beaufort-gardens, S.W.
1877	Lawrence, Sir J. J. Trevor, Bart, M.P. 9, Prince's-gate, S.W.; and Burford-lodge, Dorking, Surrey.
1870	Lawrence,* Philip Henry, Esq. 33, Chancery-lane, W.C.
1873	Lawrence, W. F., Esq. New University Club, S.W.
1868	Lawrie, James, Esq. 63, Old Broad-street, E.C.
1867	Lawson, William, Esq. 21, Walham-grove, Fulham, S.W.
1879	Laxton, Wm. Fredk., Esq., F.S.A. 4, Essex-court, Middle-temple, E.C.; and Beaconsfield Club, Pall-mall, S.W.
1862	Lay,* Horatio N., Esq., C.B. Rumleigh, Tavistock, Devon.
1857	Layard, Right Hon. Sir Austen H., G.C.B., D.C.L. (H.M.'s Ambassador, Constantinople).

G. C. p.



## Year of Election.

1876	Layard, Capt. Brownlow E. <i>Sheet-street, Windsor.</i>
1866	Layard,* Captain Brownlow Villiers (3rd West India Regt.). <i>Junior United-Service Club; and 38, Upper Mount-street, Dublin.</i>
1863	Leaf,* Charles J., Esq. 6, <i>Sussex-place, Regent's-park, N.W.</i>
1875	Leake,* Sir Luke S., Knt. <i>Perth, Western Australia. Care of C. J. Wainwright, Esq., 162, Highbury New-park, N.</i>
1875	Leared, Dr. Arthur. 12, <i>Old Burlington-street, W.</i>
1874	Leared, Jno., Esq. 12, <i>Old Burlington-street, W.</i>
1874	Learmonth, Andrew James L., Esq. <i>Junior United Service Club, S.W.</i>
1876	Learmonth, Thos. Livingstone, Esq. 45, <i>Gloucester-gardens, W.</i>
1873	Leaver, J. Christopher, Esq., <i>Rostherne-house, Castlenau, Barnes, Surrey.</i>
1866	Lebour, G. A., Esq. <i>Weedpark-house, Dipton, Lintz-green, Durham.</i>
1853	Le Breton,* Francis, Esq. 21, <i>Sussex-place, Regent's-park, N.W.</i>
1861	Leckie, Patrick C., Esq. 7, <i>Palace-road, Roupell-park, Streatham, S.W.</i>
1870	Lecky, Capt. Squire Thornton Stratford (Royal Naval Reserve). <i>Forest-Edge, Seay, near Lymington, Hampshire.</i>
1875	Lee, Rev. Albert. <i>Silk-hall, Tockholes, near Darwen, Lancashire.</i>
1877	Lee, Henry, Esq., F.L.S., &c. <i>The Waldrons, Croydon.</i>
1868	Lee, John, Esq. <i>Grosvenor-cottage, Versailles-road, Anerley, S.E.</i>
1873	Lee, John Dunkin, Esq. <i>The Oaks, Belvedere-park.</i>
1874	Leeman, George, Esq., M.P. 7, <i>Dean's-yard, Westminster, S.W.</i>
1878	Lees, Eli, Esq. 102, <i>Lancaster-gate, W.</i>
1879	Lees, Lieut. Hastings Rowley, R.N. <i>H.M.S. 'Excellent,' Portsmouth.</i>
1869	Lees,* Lieutenant-Colonel Nassau, D.C.L. <i>Athenarum Club, S.W.</i>
1879	Lees, Robert Wilson, Esq. 25, <i>Hampden-street, Bolton-le-Moors.</i>
1865	Le Feuvre, W. H., Esq., C.E.
1833	Lefevre,* Sir John George Shaw, M.A., D.C.L., F.R.S. 41, <i>Seymour-street, W.</i>
1878	C. p. Lefroy, Anthony O'Grady, Esq., C.M.G. <i>Care of Mrs. Bruce, 51, Cathcart-road, S.W.</i>
1853	Lefroy, General Sir John Henry, R.A., K.C.M.G., F.R.S., &c. 82, <i>Queen's-gate, S.W.; and Athenarum Club, S.W.</i>
1862	Leggatt, Clement Davidson, Esq. 1, <i>Pinner's-court, Old Broad-street, E.C.</i>
1861	Lagh, William John, Esq. 38, <i>Belgrave-sq., S.W.; and Lyme-park, Cheshire.</i>
1861	Lehmann,* Frederick, Esq. 15, <i>Berkeley-square, W.</i>
1845	Leigh, John Studdy, Esq., F.G.S.
1869	Leigh, Roger, Esq. <i>Barham-court; and Hindley-hall, Hindley.</i>
1877	Leighton, Thomas, Esq. <i>The Limes, West Brixton, S.W.</i>
1863	Le Mesurier, Henry P., Esq., C.S.I., C.E. 21, <i>Stanley-crescent, Kensington-park, W.</i>
1878	Lepper, Chas. H., Esq. <i>Rookwood, Bradford, Yorkshire.</i>
1874	Le Pays, Geo. Renatus, Esq. 38, <i>Brunswick-terrace, Brighton; and Thatched-House Club, S.W.</i>
1867	L'Estrange, Carleton, Esq. <i>Carlton Club, S.W.</i>
1876	Lethbridge, Edwin B., Esq. 42, <i>Coleman-street, Brighton.</i>
1873	Letts, Thomas, Esq. 2, <i>Crown-buildings, Queen Victoria-street, E.C.</i>

Year of Election.		
1876		Lever, J. O., Esq. 97, <i>St. George's-square, S.W.</i>
1857		Leverson, George B. C., Esq. 18, <i>Queensberry-place, Cromwell-road, S.W.</i>
1876		Leverson, Lieut. Julian Jno., R.E. 18, <i>Queensberry-place, Cromwell-road, S.W.</i>
1869		Leveson, Edward J., Esq. <i>Cluny, Crescent-wood-road, Sydenham-hill, S.E.</i>
1873	P.	Levi, Professor Leone, F.S.A., &c. 19, <i>Richmond-crescent, Barnsbury, N.; and 5, Crown Office-row, Temple, E.C.</i>
1874		Levin, Nathaniel, Esq. 44, <i>Cleveland-square, W.</i>
1859		Levinsohn, Louis, Esq. <i>Vernon-house, Clarendon-gardens, Maida-hill, W.</i>
1876		Levy, B. W., Esq. 19, <i>St. Helen's-place, E.C.</i>
1873		Lewin,* Frederick Dealtry, Esq. <i>Morelands, St. John's-park, Blackheath, S.E.</i>
1877		Lewin, F. Geo., Esq. 4, <i>Lombardian-villas, St. Mary's-road, Peckham, S.E.</i>
1869	P.	Lewin,* Col. Thomas H. (Beng. Staff Corps). <i>Tanhurst, Dorking.</i>
1879		Lewis,* Edwd. Wm., Esq. <i>Beaudesert, Leighton Buzzard.</i>
1876		Lewis, Francis T., Esq.
1872		Lewis, Jos., Esq., R.N. <i>Castle Carrow, Carrick-on-Shannon.</i>
1874		Lewis, Rev. R. C., M.A. <i>Streatham-common, S.W.</i>
1852	P.	Leycester, Captain Edmund M., R.N. <i>White-place, near Maidenhead, Berks.</i>
1876		Leyland, R. Watts, Esq. 17H <i>Exchange-buildings North, Liverpool.</i>
1859		Lichfield, Right Hon. Thomas George, Earl of. <i>Shugborough, Staffordshire.</i>
1878		Lienhardt, Chas. Eugene, Esq. 4, <i>East India-avenue, E.C.</i>
1856		Lilford, Thomas Lyttleton Powys, Lord. <i>Lilford-park, Oundle, Northamptonshire.</i>
1875		Lillingston, Lieutenant F. G. Innes, R.N. <i>Coilemore-house, Lochalsh, Ross-shire.</i>
1860		Lindsay, H. Hamilton, Esq. 14, <i>Windham-place, Bryanston-square.</i>
1870		Lindsay, Lord, M.P. 47, <i>Brook-street, Grosvenor-square, W.</i>
1867		Lindsay,* Colonel Robert J. L., V.C., M.P. <i>Lockinge-house, Wantage, Berks: and 2, Carlton-gardens, S.W.</i>
1869		Lindsey, Mark John, Esq. 32, <i>Ludgate-hill, E.C.; and Burnt-ash-lane, Lee, Kent.</i>
1877		Lissa, Joseph Isaac Cohen de, Esq. <i>Port Louis, Mauritius.</i>
1875		Lister, Isaac S., Esq. <i>The Heath, Hampstead, N.W.</i>
1866		Little, Archibald J., Esq. <i>Shanghai; and 18, Park-street, Grosvenor-square, W.</i>
1871		Little, Simon, Esq. <i>Calantra-house, Wexford, Ireland.</i>
1876		Littledale, Clement St. George, Esq. <i>Highfield, near Liverpool.</i>
1870		Littleton, The Hon. Henry S. <i>Teddesley, Penkridge, Staffordshire.</i>
1875		Littleton, Hon. Wm. F.
1877		Liversidge, Archibald, Esq., F.G.S., &c. <i>Care of Messrs. Trübner and Co., 57, Ludgate-hill, E.C.</i>
1878		Lloyd, Alfred, Esq. <i>Bush-lane, Cannon-street, E.C.</i>
1875		Lloyd, Capt. C. Henry. <i>Care of Messrs. Jno. Jupp and Co., 113, Fenchurch-street, E.C.</i>
1874		Lloyd, Francis Aylmer, Esq. 2, <i>Saint Charles-square, Notting-hill, W.</i>
1857		Lloyd,* Hon. Geo. A. <i>Sydney, N. S.W.; and 3, George-yard, Lombard-st., E.C.</i>
1864		Lloyd,* W., Esq. <i>Myood-house, Wednesbury, Staffordshire.</i>
1867	P.	Lloyd, Rev. William V., M.A.
1861		Lluelyn, Major Richard. <i>Army and Navy Club, S.W.</i>



Year of Election.		
1869		Lluellyn, Major William R., R.A. <i>Plymouth.</i>
1877		Lobb,* John, Esq.
1868		Lobley, James Logan, Esq., F.G.S. <i>New Athenæum Club, Suffolk-street, Pall-mall, S.W.</i>
1859		Loch, Henry Brougham, Esq. <i>Government-house, Isle of Man.</i>
1861		Loch, John Charles, Esq. 57, <i>Netherwood-road, West Kensington, W.</i>
1857		Loch, William Adam, Esq. 42, <i>Redcliffe-gardens, S.W.</i>
1874		Lock, Alfred G., Esq. 89, <i>Mostyn-road, Brixton, S.W.; and Roselands, Millbrook, Southampton.</i>
1864		Locke, John, Esq. 83, <i>Addison-road, Kensington, W.</i>
1858	p.	Lockhart, William, Esq., F.R.C.S. 67, <i>Grancille-park, Blackheath, S.E.</i>
1868		Lockhart, Captain Wm. Stephen Alexander.
1874		Loder,* Edmund Giles, Esq. 42, <i>Grosvenor-square, W.</i>
1872		Logan, Sir T. Galbraith, K.C.B., M.D. 40, <i>Hyde-park-square, W.</i>
1868		Lomonosoff, M. Alexis de. <i>Assist.-Sec. Geographical Society, St. Petersburg. Care of Messrs. Hamilton and Co., 32, Paternoster-row, E.C.</i>
1860		Londesborough, Wm. Henry Forester, Lord. 38, <i>Berkeley-square, W.</i>
1830	C. p.	Long,* George, Esq., M.A. 2, <i>Rhine-villas, Portfield, Chichester.</i>
1874		Long, Rev. James. 14, <i>Salisbury-square, Fleet-street, E.C.</i>
1857		Long,* W. Beeston, Esq.
1873		Longbottom, A. P., Esq., C.E.
1876		Longden, Major-General Henry Edward, C.B. 44, <i>Lower Leeson-street, Dublin; and United Service Club, S.W.</i>
1872		Longden, Sir J. R., K.C.M.G. <i>Goverment-house, Trinidad. Care of Mr. J. P. Martineau, 13, King's-road, Bedford-row, W.C.</i>
1865		Longley,* Lt.-Col. George, R.E. <i>Care of H. Longley, Esq., 8, Lowndes-street, S.W.</i>
1847		Longman, Thos., Esq. <i>Paternoster-row, E.C.</i>
1870		Longstaff,* Lieut.-Colonel Llewellyn Wood. <i>Reform Club, Pall-mall, S.W.</i>
1861		Lonsdale, Arthur Pemberton, Esq.
1860		Looker, William Robert, Esq. <i>Melbourne, Australia. Care of Mr. Ashhurst, 9, Fenchurch-street, E.C.</i>
1875		Lord, W. Barry, Esq. <i>Downshire-hill-cottage, Hampstead, N.W.</i>
1874	C.	Lorne, The Most Hon. the Marquis of, K.T., M.P. <i>Canada.</i>
1876		Lort, William, Esq. <i>Fron Goch Hall, Llanllugan, Yni Berriew, Montgomeryshire.</i>
1875		Lothian,* Maurice Jno., Esq. <i>Woodcote-park, Blackheath, N.B.</i>
1864		Lothian, Most Hon. William Schomberg, Marquis of. <i>Newbattle-abbey, Dalkeith, N.B.</i>
1879		Louis, Julian A. H., Esq. 22, <i>Great Ormond-street, W.C.</i>
1873	p. .	Lovett, Major Beresford, R.E. <i>The Rectory, Pickwell, Oakham.</i>
1856		Lovett, Phillips Cosby, Esq. <i>Liscombe-house, Liscombe, Leighton Buzzard.</i>
1867		Low, Alex. F., Esq. 84, <i>Westbourne-terrace, W.</i>
1875		Lew, Chas. R., Esq. (Lieut. late I.N.) 82, <i>Elham-road, Kensington, W.</i>
1863		Low, S. P., Esq. 55, <i>Parliament-street, S.W.</i>
1858		Lowden, Rev. George Rouse. <i>St. Leonard-villa, Hanwell, Middlesex.</i>

Year of Election.	
1859	Lowe, Captain W. Drury. 19, <i>Portman-square, W.</i>
1873	Lowther,* Capt. Marcus, R.N. <i>Thornton, Ryde.</i>
1878	Loyd, Lieut. Lewis Vivian (Grenadier Guards). 18, <i>Grosvenor-place, S.W.</i>
1870	Luard, Captain Charles Edward, R.E. <i>Portsmouth.</i>
1873	Luard, Major-General R. G. A. 8, <i>Albert-villas, Clifton, Bristol.</i>
1866	Luard, Wm. Charles, Esq. <i>Llandaff-house, Cardiff; and Athenaeum Club, S.W.</i>
1871	Lubbock,* Sir John, Bart, M.P., F.R.S., &c. <i>High-elms, Beckenham, Kent.</i>
1879	Lucas, Alfred Walter, Esq. <i>Queen's-park, Chester.</i>
1876	Lucas,* Arthur, Esq., C.E. 15, <i>George-street, Hanover-square, W.</i>
1877	Luck, F. G., Esq. <i>The Olives, Wadhurst, Sussex.</i>
1879	Luck, Harry Courtenay, Esq. <i>Salcott-road, New Wandsworth, S.W.</i>
1875	Luckman, Alfred, Esq.
1871	Ludlow, Edgar John David, Esq. <i>Care of Geo. Perry, Esq., 67, Charleswood street, St. George's-road, S.W.</i>
1873	Lugard, General Right Hon. Sir Edward, G.C.B. 10, <i>Albert-place, Victoria-road Kensington, W.</i>
1872	Lumsden,* Colonel Sir P. S., K.C.B., C.S.I. (Quartermaster-General, Bengal Army). <i>United Service Club, Pall-mall, S.W.</i>
1860	Lumsden,* Rev. R. C., M.A., F.R.A.S. <i>Maidenhead.</i>
1860	Lush, Hon. Sir Robert, Q.C. <i>Balmoral-house, Avenue-road, Regent's-park, N.W.</i>
1873	Lushington-Tilson,* Rev. W. R. Tilson Marsh, M.A. <i>Oxford and Cambridge Club, S.W.; Conservative Club, S.W.; and Stretham Manor, Isle of Ely.</i>
1877	Lutley, Robert George, Esq. <i>Care of Mrs. Lutley, 11, Baring-crescent, Exeter.</i>
1876	Luttrell,* Lieut. Alexander Fownes (Gren. Guards). <i>Guards' Club, Pall-mall, S.W.; and Dunster-castle, Somerset.</i>
1873	Lycett, Sir Francis, K.C.B. 18, <i>Highbury-grove, Highbury, N.</i>
1866	Lydall, J. H., Esq. 12, <i>Southampton-buildings, Chancery-lane, W.C.</i>
1873	Lydgate, Robert, Esq. <i>Upper School, Peckham, S.E.</i>
1873	Lydgate, Wm., Esq. <i>The Castle School, Guildford.</i>
1869	Lye, John Gaunt, Esq. 14, <i>Kensington-gate, Hyde-park-south, W.</i>
1877	Lyell, Francis H., Esq. 9, <i>Cornwall-gardens, S.W.</i>
1861	p. Lynch,* Thomas Kerr, Esq. 31, <i>Cleveland-square, Hyde-park, W.</i>
1858	Lyne, Francis, Esq. 5, <i>Seagrave-place, Pittville, Cheltenham.</i>
1875	Lyne, Robt. E., Esq. <i>Royal Dublin Society, Dublin.</i>
1879	Lysons, General Sir Daniel, K.C.B. 92, <i>St. George's-square, S.W.</i>
1879	Maberley, Alf. Wm., Esq., C.E. <i>Exeter-hall, Strand, W.C.</i>
1877	Macalister,* James, Esq. 95, <i>Bishopsgate-street-within, E.C.</i>
1877	Macartney, William Grey E., Esq. 90, <i>New Bond-street, W.</i>
1875	Macaulay, James, Esq. 7, <i>Albemarle-street, W.</i>
1863	Macbraire, James, Esq. <i>Broadmeadows, Berwick-on-Tweed.</i>
1876	Macdon, G. de Laudre, Esq. <i>Hilbre-house, West Kirby, Cheshire.</i>



Year of Election.

- 1875 Macdonald,\* James, Esq. 17, *Russell-square, W.C.*
- 1873 Macdonald, Colonel John (Beng. Staff Corps). *Care of Messrs. Grindlay and Co., 55, Parliament-street, S.W.*
- 1871 Macdonald, William, Esq. *Yokohama, Japan. Care of Messrs. Knevit and Co., 9, Fenchurch-street, E.C.*
- 1879 Macdonald, Major-General W. C. R., C.B. *United Service Club, Pall-mall, S.W.*
- 1877 Macdonald, Wm. M., Esq. *St. Martin's, Perth.*
- 1843 P. Macdonnell, Sir Richard Graves, K.C.M.G., C.B. *Athenaeum Club, Pall-mall, S.W.*
- 1873 MacEachen, Archibald, Esq. "*Seaside*," *Campbeltown, Argyll, N.B.*
- 1865 Macfarlan, John G., Esq. *The Tower, Richmond-bridge.*
- 1876 Macfarlane, Donald, Esq., M.D. 21, *Hyde-park-place, W.; and East India U. S. Club, St. James's-square, S.W.*
- 1874 Macfarlane, Donald H., Esq. 62, *Portland-place, W.*
- 1879 MacGregor, Alex., Esq., C.E. 6, *Charles-street, Berkeley-square, W.*
- 1868 MacGregor, Lieut.-Col. C. M., C.B.
- 1855 MacGregor, Duncan, Esq. *Athenaeum Club, S.W.*
- 1872 MacGregor,\* John, Esq., M.A. 7, *Vanbrugh-park East, Blackheath; and Athenaeum Club, S.W.*
- 1845 Macintyre,\* Patrick, Esq., F.S.A. 1, *Maida-vale, W.*
- 1859 Mackay, Rev. Alexander, LL.D. *Prospect-house, Grove-road, Ventnor, Isle of Wight.*
- 1870 Mackay, Neville F., Esq. 3, *Salter's-hall-court, Cannon-street, E.C.*
- 1873 Mackelvie, Jas. Tannock, Esq. 21, *Victoria-st., S.W.; and 7, Albemarle-st., W.*
- 1877 Mackenzie, Capt. Colin (78th Highlanders). *Naval and Military Club, Piccadilly, W.*
- 1878 Mackenzie,\* Colin, Esq. *Care of Messrs. J. Bramley-Moore and Co., Liverpool.*
- 1860 Mackenzie,\* James T., Esq. *Hatchford, Cobham, Surrey.*
- 1873 Mackenzie, William, Esq., M.D., C.B. 2, *Gloucester-houses, Gloucester-crescent, S.W.; and East India United Service Club, S.W.*
- 1864 Mackeson,\* Edward, Esq. 13, *Hyde-park-square, W.*
- 1862 Mackinlay, D., Esq. *Oriental Club, W.*
- 1867 Mackinlay, John, Esq., J.P., M.I.C.E. *Percy-house, 15, Percy-circus, W.C.*
- 1878 Mackinnon,\* Rev. Donald Dimsdale, M.A. *New University Club, St. James's-street, S.W.*
- 1865 C. Mackinnon,\* W., Esq. *Tarbert, Lochfyne, Argyleshire; and 7, Lothbury, E.C.*
- 1872 Mackintosh, Alex, Esq. 9, *Talbot-square, Hyde-Park, W.*
- 1861 Mackintosh, Alexander Brodie, Esq. *Oriental Club, W.; and Dunoon, Scotland.*
- 1860 Mackirdy, Gen. Elliot (69th Regiment). *U. S. Club, S.W.*
- 1873 Mackley, Thomas Cole, Esq. 12, *Mark-lane, E.C.*
- 1871 MacLagan, Lieut.-Gen. Robert, R.E. *Care of Messrs. Crawford, Colvin, and Co., 71, Old Broad-street, E.C.*
- 1871 MacLaine, Murdoch G., Esq., of Lochbuy. *Oban, Scotland.*
- 1860 Maclean, William Clifton, Esq., F.G.S. 31, *Camperdown-place, Great Yarmouth.*
- 1859 MacLeay, Sir George, K.C.M.G. *Pendell-court, Bletchingley.*

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1855		Maclure, Andrew, Esq. <i>Messrs. Maclure, Macdonald, and, Macgregor, 97, Queen Victoria-street, E.C.</i>
1861		Maclure, John William, Esq. <i>The Home, Whalley-range, Manchester.</i>
1879		MacMahon, Colonel Charles. <i>Marlow-road, Kensington, W.</i>
1861		Macmillan, Alex., Esq. 1, <i>Bedford-street, Covent-garden, W.C.</i>
1874		MacMurdo, Lieut.-General, C.B. <i>Rose-bank, Fulham.</i>
1871		Macnab, Duncan Macpherson, Esq. <i>Union Club, S.W.</i>
1874		Macnamara, Surg.-Maj. F. N., M.D. (Indian Army). 28, <i>Palace-gardens-terrace, W.</i>
1878		Macneill, Duncan, Esq. 7, <i>Lothbury, E.C.</i>
1870		Macturk, John, Esq. 8, <i>Hillhead-gardens, Glasgow.</i>
1871		MacVicar, Lieut. Jno. A. (93rd Highlanders). <i>Naval and Military Club, 94, Piccadilly, W.</i>
1878		McAlister, Alex., Esq. 242, <i>Richmond-road, Hackney.</i>
1873		McAlpin, Donald A. L., Esq., R.N. 1, <i>Llanion-terrace, Pembroke Dock, South Wales.</i>
1873		McAlpin, Kenneth W. A. G., Esq. <i>Llanion-terrace, Pembroke-dock, South Wales.</i>
1875		McAndrew, Maj.-Gen. G. (Bengal Staff Corps). <i>Care of Messrs. Griadlay and Co., 55, Parliament-street, S.W.</i>
1863		McArthur, Alex., Esq., M.P. <i>Raleigh-hall, Brixton-rise, Brixton, S.W.</i>
1867		McArthur, William, Esq. 1, <i>Gwydyr-houses, Brixton-rise, S.W.</i>
1872		McCall, John, Esq. <i>Care of J. Walker, Esq., Bridewell-place, New Bridge-street, E.C.</i>
1879		McClatchie, H. Parkes, Esq. <i>Thatched-house Club, St. James's-street, S.W.</i>
1876		McClean, Rev. D. Stuart. <i>Norwood-rectory, Southall, Middlesex.</i>
1868		McClean, Frank, Esq., M.A., C.E. <i>Ferncliffe, Tunbridge Wells.</i>
1860	G. C. P.	McClintock, Admiral Sir Francis Leopold, F.R.S. 29, <i>Kensington-gate, Palace-gate, W.; and United Service Club, S.W.</i>
1871		McClure,* Joseph Henry, Esq. <i>Beaconsfield Club, Pall-mall, S.W.</i>
1876		McConnell, Jas. Edw., Esq., C.E. 2, <i>Dean's-yard, Westminster, S.W.</i>
1861		McConnell,* W. R., Esq. 12, <i>King's-Bench-walk, Temple, E.C.; and Charleville, Belfast.</i>
1862	P.	McCosh, John, Esq., M.D. <i>Junior United Service Club, S.W.</i>
1865		McEuen, D. P., Esq. 24, <i>Pembridge-square, Bayswater, W.</i>
1877		McEwan, John Thomas H., Esq. <i>Care of W. T. Ogden, Esq., 6A, Austin Friars, E.C.</i>
1874		McGavin, Alan Lawrie, Esq. <i>Cordon-lodge, Wanstead; and 2, Barge-yard, Victoria-street, S.W.</i>
1867		McGregor, Duncan, Esq. <i>Clyde-place, Glasgow.</i>
1869		McGrigor, Alexander Bennett, Esq. 19, <i>Woodside-terrace, Glasgow.</i>
1874		McIlwraith, Robert, Esq. 45, <i>Bedford-gardens, Campden-hill, W.</i>
1866		McIvor,* W. G., Esq. (Sup. of Chinchona Plantations, Ootacamund, Madras). <i>Care of Mr. E. Bumpus, Holborn-bars, E.C.</i>
1878		McKenna, Leopold, Esq. <i>Ravensbourne-park, Catford-bridge, S.E.</i>



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1873		McKerlie, P. H., Esq., F.S.A. Scot., &c. 26, <i>Pembroke-villas, Baywater, W.</i>
1867		McLean,* Hon. John. <i>Oamaru, New Zealand. Care of Messrs. Redfern, Alexander, and Co., 3, Great Winchester-street-buildings, E.C.</i>
1876		McLean,* Robert Allan, Esq., F.S.S. <i>Duart-house, The Avenue, Eltham-road, Lee, S.E.</i>
1870		McLeod, Major-Gen. W. C. 62, <i>Gloucester-gardens, Hyde-park, W.; and 14, St. James's-square, S.W.</i>
1874		McMahon, Colonel A. <i>Care of Messrs. H. S. King and Co., Cornhill, E.C.</i>
1875		McMaster, James, Esq. 1, <i>Stanhope-gardens, Queen's-gate, S.W.</i>
1866		McNair, Major John F. A., R.A. <i>Care of Messrs. Codd and Co., 35, Craven-street, W.C.</i>
1839	C.	McNeil, The Right Hon. Sir John, G.C.B. <i>Granton, near Edinburgh.</i>
1876		McNeill, Colonel J. C., V.C., C.B. <i>United Service Club, Pall-mall, S.W.</i>
1873		McVean,* Colin A., Esq., <i>Care of Rev. D. McVean, Bunesan, Scotland.</i>
1875		Madan, Rev. J. R., <i>Cedar-villa, Kensington, W.</i>
1872		Magrath, Colonel John R. (Madras Artillery, Ret.). <i>Murhill, near Bradford-on-Avon, Wilts; and East India U. S. Club, 14, St. James's-square, S.W.</i>
1877		Mair, G. J. J., Esq., F.S.A. 41, <i>Upper Bedford-place, Russell-square, W.C.</i>
1874		Maitland, Rev. A. Gray. <i>Woodford, Essex.</i>
1845	C. p.	Major,* Richard Henry, Esq., F.S.A. <i>Athenaeum Club, S.W.; and British Museum, W.C.</i>
1868		Makins,* Henry F., Esq. 8, <i>Palace-gate, Kensington, W.; and Reform Club, S.W.</i>
1858		Malby, John Walter, Esq. 135, <i>Seven-sisters'-road, Holloway, N.</i>
1862		Malcolm,* Major Edward Donald, R.E. <i>Clifton-house, York.</i>
1843		Malcolm,* W. E., Esq. <i>Burnfoot, Langholme, near Carlisle.</i>
1876		Malden, B. Jno., Esq. 14, <i>Great Coram-street, Russell-square, W.C.</i>
1872		Malleson, Colonel G. B. 27, <i>West Cromwell-road, S. Kensington, S.W.</i>
1853		Mallet,* Chas., Esq. <i>Audit-office, W.C.; and 7, Queensbro'-terrace, Baywater, W.</i>
1876		Maltby, F. Cecil, Esq. <i>Thatched-House Club, St. James's-street.</i>
1877		Man, Maj.-Gen. Henry (Madras Staff Corps). 2, <i>Palace-road, Surbiton.</i>
1870		Man, Captain J. Alexander (Imperial Maritime Customs, China). <i>Junior United Service Club, S.W.</i>
1872		Man, Captain William. <i>Care of Myles Fenton, Esq., 32, Westbourne-terrace, Hyde-park, W.</i>
1872		Man, William, Esq. <i>Woodford, Essex.</i>
1875	C.	Manchester, Wm. D. Montagu, Duke of. 1, <i>Great Stanhope-street, W.; and Kimbolton Castle, St. Neots.</i>
1874		Mann, H., Esq. <i>Belgrave-mansions, S.W.</i>
1860	p.	Mann, James Alexander, Esq., M.B.A.S.
1866	p.	Mann, Robert James, Esq., M.D. 5, <i>Kingsdown-villas, Wandsworth-common, S.W.</i>
1879		Mann, Rev. Thomas. <i>Sunnyside, Trowbridge, Wilts.</i>
1866		Manners, George, Esq., F.S.A. <i>Lansdowne-road, Croydon.</i>
1874		Manners-Sutton, Hon. Robert Henry. 12, <i>Queensberry-place, S. Kensington, S.W.</i>

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Election.

- 1856 Manning, Frederick, Esq. *Byron-lodge, Leamington*; and 8, *Dover-street, W.*
- 1864 Mansell,\* Captain A. L. *Hydrographic-office, Admiralty, S.W.*
- 1869 Mantell, Sir John Illes. *County Police-court, Strangeways, Manchester.*
- 1859 Mantell, Walter Baldock Durant, Esq. *Wellington, New Zealand. Care of A. J. Woodhouse, Esq., 1, Hanover-square, W.*
- 1873 Mantle, Wm. John, Esq. *The Grove, Lincoln.*
- 1876 Mappin, Joseph Chas., Esq. 35, *Dulwich-road, S.E.*
- 1869 March, Edward Bernard, Esq. (H.M. Consul, Calao). *Care of Messrs. King and Co., 45, Pall-mall, S.W.*
- 1871 Margetts, William G., Esq. *St. Hildas, Greenhithe*; and *St. Stephen's Club, S.W.*
- 1872 Margöschis, John Thomas, Esq. *Care of Mrs. Margöschis, Brodie-villa, Leamington.*
- 1874 Marjoribanks, Edw., Esq. 134, *Piccadilly, W.*
- 1873 T. p. Markham, Captain Albert Hastings, R.N. 21, *Eccleston-square, S.W.*
- 1854 C. p. Markham, Clements Robert, C.B., F.R.S. 21, *Eccleston-square, S.W.*; and *Athenæum Club, S.W.*
- 1877 p. Marsh, Capt. H. C. *Care of Messrs. H. S. King and Co., 65, Cornhill, E.C.*
- 1857 Marsh, Matthew Henry, Esq.
- 1876 Marshall, Horace Brooks, Esq. *Clifton-villa, Brixton.*
- 1862 Marshall,\* J. G. Don, Esq. *Birkenshaw, Hasley, Farnboro'-station, Hants.*
- 1873 Marshall, John, Esq. *Auckland-lodge, Queen's-road, Richmond.*
- 1876 Marshall,\* William, Esq. 37, *Norfolk-street, Strand, W.C.*
- 1859 Marsham,\* The Hon. Robert. 5, *Chesterfield-street, Mayfair, W.*
- 1875 Marston, Edward, Esq. 188, *Fleet-street, E.C.*
- 1877 Marten, Chas. Henry, Esq. *Combe-lodge, Blackheath, S.E.*
- 1874 Marten, C. Rous, Esq. *Wellington, New Zealand.*
- 1871 Marten, Elliott, Esq. (Vice-Consul, Sarawak). *Care of W. T. Marten, Esq., 30, Great St. Helen's, E.C.*
- 1861 Martin, Henry, Esq. *Sussex-house, Highbury-new-park, N.*
- 1860 Martin,\* Richard Biddulph, Esq. *Chisclhurst.*
- 1862 Martin, Thomas, Esq. *Beechwood, Withdean, near Brighton.*
- 1871 Mason, Charles, A. J., Esq. 3, *Gloucester-crescent, Hyde-park, W.*
- 1875 Mason, Dr. Samuel. 44, *Finsbury-circus, E.C.*
- 1871 Master, Chas. Hoskins, Esq. *Barroo-green-house, Oxted, near Godstone, Surrey.*
- 1870 Masterman, Edward, Esq. 30, *Threadneedle-street, E.C.*; and 27, *Clement's-lane, Lombard-street, E.C.*
- 1870 Masterman, Edward, jun., Esq. 57½, *Old Broad-st., E.C.*; and *Walthamstow.*
- 1876 Masterman, T. W., Esq. 4, *Spencer's-hill, Wimbledon, S.W.*
- 1869 Matheson,\* Alexander, Esq., M.P. 38, *South-street, Park-lane, W.*; and *Ardrross-castle, Ross-shire, N. B.*
- 1874 Matheson,\* Hugh Mackay, Esq. 3, *Lombard-street, E.C.*
- 1874 Mathews, Chas. Edward, Esq. *Oakgate, Augustus-road, Edgbaston, Birmingham*; and *Arts Club, W.*



Year of Election.		
1872		Mathews, William, Esq., M.A. 60, <i>Harborne-road, Birmingham.</i>
1858		Mathieson, James Ewing, Esq. 77, <i>Lombard-street, E.C.</i> ; and <i>West-heath-lodge, Hampstead, N.W.</i>
1878		Maturin, Wm. Henry, Esq., C.B. 5, <i>Courtfield-gardens, South Kensington, S.W.</i>
1873		Maude, Colonel G. A. <i>Royal Mews, Piccadilly, S.W.</i>
1875		Maudslay, Athol, Esq.
1875		Maule, Geo. Norman, Esq. 1, <i>Hare-court, Temple, E.C.</i> ; and <i>University Club, S.W.</i>
1872		Maxwell, John, Esq. <i>Lichfield-house, Richmond.</i>
1855	p.	May, Staff-Commr. Daniel John, R.N. <i>Care of Messrs. Case and Loudensack, 1, James-street, Adelphi, W.C.</i>
1879		May, Rev. J. C., <i>Sierra Leone. Care of J. R. Langler, Esq., Broxholme, Thurlow-hill, Lower Norwood, S.E.</i>
1876		May, Wm., Esq. <i>St. Mary Cray, Kent.</i>
1858		Mayer, Joseph, Esq., F.R.S. 68, <i>Lord-street, Liverpool.</i>
1862	p.	Mayne, Captain Richard Charles, R.N., C.B. 101, <i>Queen's-gate, S.W.</i>
1858		Mayo, Captain John Pole. <i>Army and Navy Club, S.W.</i>
1867		Mayson, John S., Esq., J.P. 5, <i>St. James's-square, Manchester.</i>
1863		Meade, The Hon. Robert Henry. <i>Colonial-office, S.W.</i> ; and 32, <i>Belgrave-square, S.W.</i>
1874		Meadows, Dr. Alfred. 27, <i>George-street, Hanover-square, W.</i>
1875		Meakin, Edw. E., Esq. <i>Rosenfels, Red-hill, Surrey</i> ; and 22, <i>Fenchurch-street, E.C.</i>
1872		Mensom, George Samuel, Esq. <i>St. Margaret's, Twickenham.</i>
1871	p.	Medhurst, Sir Walter H., Knt. <i>Athenaeum Club, S.W.</i>
1862		Medlycott,* Commander Mervyn B., R.N. <i>Care of Messrs. Woodhead and Co., 44, Charing-cross, S.W.</i>
1876		Meiggs,* John G., Esq. 19, <i>Great Winchester-street, E.C.</i>
1874		Meinertzhagen,* Daniel, Esq. 10, <i>Rutland-gate, S.W.</i>
1854		Melville, Major-General Sir Peter Melville. 27, <i>Palmeira-square, Brighton.</i>
1838		Melville, Philip, Esq., F.R.S. <i>Ethy-house, Lostwithiel, Cornwall.</i>
1877		Mendel, Samuel, Esq. <i>Chislehurst, Kent.</i>
1875		Menzies, Jas. Irvine, Esq. 76, <i>Stamford-street, S.E.</i>
1871		Mercer, Henry C., Esq., B.A. <i>Denham-lodge, Uxbridge.</i>
1875		Mercer, Thomas, Esq. <i>Uxbridge.</i>
1868	C.	Merewether, Colonel Sir William Lockyer, K.C.S.I., C.B. 31, <i>Linden-gardens, Kensington, W.</i> ; and <i>India-office, S.W.</i>
1871		Merritt,* Douglas, Esq. <i>Leacote, Rhinebeck, New York. Care of H. L. Sherlock and Sons, 9, Canning-place, Liverpool.</i>
1866		Messiter, Charles A., Esq. <i>The Avenue, Brampford Speke, near Exeter.</i>
1871		Messum, Josiah Young, Esq., R.N., F.R.S. (Controller of H.M.'s Packet Services). <i>General Post-office, E.C.</i> ; and <i>Bedford-villa, Sydenham-road, Croydon.</i>

Year of  
Election.

- 1867 Metcalfe, Frederic Morehouse, Esq. *Wisbech, Cambridgeshire.*
- 1874 Methuen, Capt. Hon. Paul (Scots Fusilier Guards). *Guards' Club, Pall-mall, S.W.*
- 1871 Methven, Captain Robert. 44, *Chester-square, S.W.*
- 1837 Mexborough,\* Right Hon. John Chas. Geo., Earl of. 33, *Dover-street, W.; and Methley-park, near Leeds.*
- 1865 Michell,\* General J. E., R.H.A. *Care of Mrs. Busch, 45, South Audley-street, W.*
- 1863 P. Michie,\* A., Esq. 55, *Leadenhall-street, E.C.*
- 1873 Michie, Sir Archibald, Q.C., K.C.M.G. 8, *Victoria-chambers, Victoria-street, S.W.; and Reform Club, S.W.*
- 1848 Middleton, Rear-Admiral Sir G. N. Broke, Bart. *Shrubland-park, Needham, Suffolk; and 35, Albemarle-street, W.*
- 1870 Midwinter,\* William Colpoys, Esq. *Junior Carlton Club, Pall-mall, S.W.*
- 1868 Miers,\* John William, Esq., C.E. 74, *Addison-road, Kensington, W.*
- 1872 P. Miles, Lieut.-Col. Samuel Barrett (Bombay Staff Corps), Political Agent in *Metran. Care of Messrs. King and Co., 45, Pall-mall, S.W.*
- 1876 Miller, Chas. A. D., Esq. *Sherbrooke-lodge, Brixton, S.W.*
- 1874 Miller, Rear-Admiral David. *United Service Club, Pall-mall, S.W.*
- 1861 Miller,\* Captain Henry Matthew, R.N. *United Service Club, S.W., and Fernside, Sevenoaks.*
- 1868 Miller, Robert Montgomerie, Esq. *Calverden-grove, Tunbridge Wells.*
- 1853 Miller,\* Admiral Thomas. *United Service Club, S.W.*
- 1861 Milligan, Joseph, Esq. 6, *Craven-street, Strand, W.C.*
- 1857 Mills, Arthur, Esq. 34, *Hyde-park-gardens, W.*
- 1877 Mills, Jno. Elliott, Esq. 2, *Somerset-cottage, Prior-park-road, Bath.*
- 1863 Mills,\* John R., Esq. *Kingswood-lodge, Tunbridge Wells.*
- 1877 Millward, Victor, Esq., J.P. *Fair View, Redditch, Worcestershire.*
- 1860 Milman, Lieut.-Col. Everard S., Governor H.M.'s Prison, *Holloway, N.*
- 1866 C. Milne, Admiral Sir Alex., Bart., G.C.B. 1, *Lowndes-street, S.W.; and Inveresk, Musselburgh.*
- 1879 Milne, J. V., Esq. *Henley-house, Mortimer-road, Kilburn, N.W.*
- 1867 Milner, Rev. John, B.A. *The Rectory, Middleton-in-Teesdale, Darlington.*
- 1872 Mitchell, William Aug., Esq. *Boscobel, Park-place, Leyton.*
- 1874 Mitford, Col. Jno. Philip Osbaldeston. *Mitford Castle, Morpeth, Northumberland; and Army and Navy Club, S.W.*
- 1851 Mocatta,\* Frederick D., Esq. 9, *Connaught-place, W.*
- 1873 P. Moffat,\* Rev. Dr. Robert. 64, *Knock-road, Brixton-road, S.W.*
- 1879 Moffat, Robt. Jno., Esq. *Great Shelford, Cambridgeshire.*
- 1873 Moleyns, Major T. A. de, R.A. 53, *Seymour-street, Portman-square, W.*
- 1879 Möller, Olé Peter, Esq. 15, *The Terrace, Blackheath.*
- 1879 Moloney, Capt. A. C. *Care of Messrs. Cox and Co., Craig's-court, S.W.*
- 1876 Molyneux, Capt. W. C. F. 18, *Prince of Wales-terrace, Kensington, W.; and Junior United Service Club, S.W.*



Year of  
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- 1877 Money, Lieutenant-Colonel Gerard Noel (Bengal Staff Corps). *Stodham-park, Petersfield. Care of Messrs. H. S. King and Co., 65, Cornhill, E.C.*
- 1871 Montagu, Jno. M. P., Esq. *Downe-hall, Bridport, Dorset, and Union Club, S. W.*
- 1862 Montague,\* Lieut.-Colonel Horace. *6A, Waterloo-place, S. W.*
- 1830 Montefiore,\* Sir Moses, Bart., F.R.S., F.R.S.N.A. *7, Grosvenor-gate, Park-lane, W.; and East-cliff-lodge, Ramsgate.*
- 1876 Montgomery, Jno. B. H., Esq. *33, Mount-street, Grosvenor-square, W.*
- 1878 Montgomery, Percy Hugh Seymour, Esq. *Grey Abbey, Ireland.*
- 1860 Montgomery, Robert Mortimer, Esq. *3, Porchester-place, Oxford-square, W.*
- 1865 Montgomery, Sir Robert, G.C.S.I., K.C.B. *7, Cornwall-gardens, Queen's-gate, S. W.*
- 1874 Moodie, G. P. Esq. *Care of J. J. Pratt, Esq., 79, Queen-street, Cheapside, E.C.*
- 1839 Moody, General R. C., R.E. *Caynham-house, near Ludlow, Shropshire.*
- 1857 Moor,\* Rev. Allen P., M.A., F.R.A.S. *St. Clement's-parish, Truro.*
- 1874 Moore, Adolphus W., Esq. *India-office, S. W.*
- 1861 Moore, John Carrick, Esq., F.R.S. *Cornwall, Wiltshire; and 113, Eaton-square, S. W.*
- 1870 Moore, John, Esq. *36, Mark-lane, E.C.*
- 1870 Moore,\* Joseph, Esq. *Rydal-mount, Champion-hill.*
- 1878 Morant, John H., Esq., C.E. *10, Victoria-terrace, Weymouth.*
- 1872 Morant,\* Major J. L. L. (R. Mad. Eng.). *Mountstuart, Ootacamund, Neilgherries, Madras Presidency. Care of Messrs. John Gladding and Sons, 28A, Paternoster-row, E.C.*
- 1863 More, R. Jasper, Esq. *Linley-hall, Salop.*
- 1869 p. Morgan,\* Delmar, Esq. *15, Roland-gardens, South Kensington, S. W.*
- 1864 Morgan, D. L., Esq. (Deputy Inspector-General, R.N.).
- 1861 Morgan, Junius Spencer, Esq. *13, Prince's-gate, Hyde-park, S. W.*
- 1866 Morland,\* Lieut. Henry, late I.N.
- 1839 Morris,\* Charles, Esq.
- 1871 Morris, Edw. Ellis, Esq. *Care of H. Morris, Esq., Eastcote-house, St. John's-park, Blackheath, S.E.*
- 1877 Morris, Edward S., Esq. *Wanderers' Club, Pall-mall, S. W.; and Pontamman, Cross Inn, Carmarthenshire.*
- 1871 Morrison,\* Alf., Esq. *16, Carlton-house-terrace, S. W.*
- 1863 Morrison, Colonel J. C. D. *United Service Club, Pall-mall, S. W.*
- 1867 Morrison, Pearson, Esq. *Care of John Hockin, Esq., 8, Tokenhouse-yard, Lothbury, E.C.*
- 1865 Morson, Thomas, Esq. *124, Southampton-row, Russell-square, W.C.*
- 1876 Mortimore, Foster, Esq. *78, Eccleston-square, S. W.*
- 1873 Mosenthal, Adolph, Esq. *23, Pembroke-square, W.*
- 1869 Moser, Robert James, Esq. *45, Bedford-square, W.C.*
- 1877 Moses, Marcus Tertius, Esq. *Eberton-Leison-park; and 11, Eustace-street, Dublin.*
- 1869 Mott, F. T., Esq. *1, De Montfort-street, Leicester.*

Year of  
Election.

- 1861 p. Mount,\* Frederick J., Esq., M.D. (Surgeon-Major and Inspector-General of Prisons, Bengal Army, &c.). 12, *Durham-villas, Kensington, W.*; and *Athenæum Club, S.W.*
- 1868 Mounsey,\* Aug. Henry, Esq. (British Legation, *Yedo*.) *Care of R. H. Mounsey, Esq., Castle-street, Carlisle.*
- 1871 Mowatt,\* James, Esq., M.A. 5, *Notting-hill-square, W.*; and *Caius College, Cambridge.*
- 1871 Mozley,\* H. W., Esq., M.A. *Eton College.*
- 1858 Mudie, Charles Edward, Esq. *Muswell-hill.*
- 1858 p. Mueller, Ferdinand, Esq., M.D., PH.D. *Director of the Botanical Gardens, Melbourne. Care of Messrs. Dulau and Co., 37, Soho-square, W.*
- 1878 Muggeridge, W. H. Esq. *Bathurst, Devonshire-road, Wandsworth-road, S.W.*
- 1874 Muir,\* Hugh B., Esq. 26, *Old Broad-street, E.C.*
- 1867 Muir,\* Thomas, Esq. *Madeira*; and 24, *York-terrace, Regent's-park, N.W.*
- 1877 p. Mullens, Rev. Joseph, D.D. 14, *Bloomfield-street, London-wall, E.C.*
- 1877 Mullens,\* Josiah, Esq. *Burwood, Sydney, New South Wales. Care of Rev. J. Mullens, 14, Bloomfield-street, E.C.*
- 1876 Mulliner, Robt. Bouverie, Esq. *Grove-house, Grove-park, Chiswick.*
- 1875 Mundy, Daniel Louis, Esq. *Care of Messrs. Budden, Fisser, and Co., 48, Fenchurch-street, E.C.*
- 1875 Munro, Dr. 11, *Park-lane, W.*
- 1873 Münster, His Excellency Count (Ambassador of the German Empire). *German Embassy, 9, Carlton-house-terrace, S.W.*
- 1869 Munton, Francis Kerridge, Esq. *Gloucester-house, Stonebridge-park, Willesden, N.W.*
- 1866 Murchison,\* John H., Esq. *Junior Carlton Club, S.W.*
- 1859 C. Murchison, Kenneth R., Esq. 24, *Chapel-street, Park-lane, W.*; and *Brookehurst, East Grinstead, Sussex.*
- 1830 C. Murdoch,\* Sir Thomas W. Clinton, K.C.M.G. 8, *Park-street, Westminster, S.W.*; and 88, *St. George's-square, S.W.*
- 1878 Murray, A. H. Hallam, Esq., B.A. 50, *Albemarle-street, W.*
- 1860 Murray, George J., Esq. *Wootton-court, Canterbury*; and *Junior Carlton Club, S.W.*
- 1872 Murray,\* G. S. D., Esq. 118, *Pall-mall, S.W.*
- 1868 Murray,\* Henry, Esq. *Garrick Club, Garrick-street, W.C.*
- 1830 C. Murray, John, Esq. 50, *Albemarle-street, W.*; and *Newstead, Wimbledon, S.W.*
- 1872 Murray,\* John, jun., Esq. 50, *Albemarle-street, W.*; and *Newstead, Wimbledon, S.W.*
- 1876 Murray, Lieut. John Geo., R.A. *Lisnanaudre, Crossdoney, Ireland.*
- 1870 Murray, T. Douglas, Esq. 34, *Portland-place, W.*
- 1860 Murray,\* Major W. G. (Beng. Staff Corps). *Lairtheaite, Keswick, Cumberland*; and *Portigliolo, Ajaccio, Corsica.*
- 1870 Murray, William Vaughan, Esq., M.R.I., &c. 4, *Westbourne-crescent, Hyde-park, W.*



Year of Election.		
1876		Nagaoka, M. J., Esq. <i>Care of M. Nagasaki, Esq., 9, Kensington-park-grdns., W.</i>
1876		Nahishima,* N. H., Esq. <i>Care of M. Nagasaki, Esq., 9, Kensington-park-gardens, W.</i>
1875		Naidu, P. Venkatakrishnama, Esq., Barrister-at-Law, High Court, Madras. <i>Care of Messrs. Binny and Co., Leadenhall-street, E.C.</i>
1865		Nairne, P. A., Esq. 2, <i>Groce-hill, Camberwell, S.E.</i>
1868		Napier of Magdala, Rt. Hon. Lord, G.C.B., G.C.S.I., F.R.S. <i>Care of Messrs. Coutts and Co., Strand.</i>
1876	P.	Napier, Capt. Hon. Geo. <i>Care of Messrs. Grindlay and Co., 55, Parliament-street, S.W.</i>
1861		Napier, William, Esq.
1871	G. p.	Nares, Captain Sir George S., B.N., K.C.B. 23, <i>St. Philip's-road, Surbiton.</i>
1875		Needham, S. H., Esq., F.G.S. 5, <i>Mecklenburg-street, Mecklenburg-square, W.C.</i>
1873		Nelson, George Henry, Esq. <i>Wyggeston's Hospital Boys' School, Leicester.</i>
1857		Nesbitt,* Henry, Esq. 12, <i>Victoria-villas, Kilburn, N.W.</i>
1875		Nesbitt, William, Esq. <i>Junior Carlton Club, Pall-mall, S.W.</i>
1869		Neville, Lieut.-Col. Edward. 6, <i>Bolton-gardens, South Kensington, S.W.</i>
1879		Newall, Major-General David J. F. <i>Beldorine-toucer, Ryde, Isle of Wight.</i>
1870		Newall, Wm. Johnstone, Esq. 33, <i>South-street, Park-lane, W.</i>
1868		Newbatt, Benjamin, Esq., F.S.S., &c. 7, <i>Vicarage-gardens, Campden-hill, W.</i>
1876		Newby, Edwin H., Esq. <i>Chatham-buildings, New-bridge-street, E.C.</i>
1867		Newdigate, Lieut.-Col. Francis W. (Coldstream Guards). 26, <i>Seymour-street, W.; and Byrkley-lodge, Needwood Forest, Burton-upon-Trent.</i>
1876		Newman, Geo. G., Esq. 75 and 76, <i>Cornhill, E.C.</i>
1856		Newman, Thomas Holdsworth, Esq. 9, <i>Gt. Cumberland-place, Hyde-park, W.</i>
1873		Newton, Alfred P., Esq. 15, <i>Sheffield-gardens, Campden-hill, W.</i>
1872		Newton, Wm., Esq. 11, <i>Mitre-court, Temple, E.C.</i>
1870		Nicholas, W., Esq. <i>The Drive, Walthamstow.</i>
1870		Nicholl, Henry John, Esq. 16, <i>Hyde-park-gate, W.</i>
1865		Nichols,* Robert C., Esq. 5, <i>Sussex-place, W.</i>
1856	C. p.	Nicholson, Sir Charles, Bart., D.C.L. <i>The Grange, Totteridge, Herts, N.</i>
1875		Nicholson, Robert, Esq. <i>Loan End-house, Norham, near Berwick-on-Tweed, Northumberland.</i>
1868		Nicol, Geo. Wm., Esq. 312, <i>South Lambeth-road, S.W.</i>
1869		Nicol,* Robert, Esq. <i>Reform Club, S.W.; and Westminster-palace-hotel, S.W.</i>
1877		Nicolle, Wm., Esq., M.A. 107, <i>Lansdowne-road, Notting-hill, W.</i>
1871		Nicols, Arthur Robert, Esq. 11, <i>Church-rose, Hampstead, N.W.</i>
1836		Nicolson, Vice-Admiral Sir Frederick Wm. Erskine, Bart., C.B. 15, <i>William-street, Lowndes-square, S.W.</i>
1878		Nightingale, Percy, Esq. <i>Sidmouth, Devon.</i>
1873		Nimmo, Rev. R., B.A., R.N. <i>Mill-house, Grantchester, near Cambridge; and H.M.S. 'Lord Warden.'</i>
1858		Nix, John H., Esq. 77, <i>Lombard-street, E.C.</i>

Year of Election.		
1874		Noldwirth,* Jno. Spencer, Esq. 44, Benhill-road, Brunswick-square, Camberwell, S.E.
1857		Nolloth,* Admiral Matthew S. A 12, Albany, Piccadilly, W.; and United Service Club, S.W.
1876		Norman, Capt. Charles B.
1865		Norman, H. J., Esq. 4, Halkin-street, Grosvenor-place, S.W.
1877		Norman, Lieut.-General Sir H. W., K.C.B. 16, Westbourne-square, W.
1876		Normandy, Frank, Esq.
1872		Norris, Charles, Esq. 124, Wood-street, E.C.; and Marischal-road, Lee, Kent.
1860		Norris, Harry, Esq. 38, St. James's-place, S.W.
1878		Norris, John, Esq. Tanshelf-house, Pontefract.
1861		North, Alfred, Esq. 23, Lansdowne-crescent, Notting-hill, W.
1879		Northbrook,* Thos. Geo. Baring, Earl of, G.C.S.I., D.C.L., &c. 4, Hamilton-place, W.; and Brooks's Club, St. James's-street, S.W.
1865		Northumberland, Algernon George, Duke of. 2, Grosvenor-place, S.W.
1875		Norton, Geo., Esq., M.A. 22, Great George-street, S.W.
1877		Norton, Henry Turton, Esq., M.A. 33, Cornhill-gardens, Queen's-gate, S.W.
1862		Notman, Henry Wilkes, Esq. 7, Great Marlborough-street, W.
1862		Nourse, Henry, Esq. Athenæum Club, S.W.
1875		Oates, Wm. Edward, Esq. Meanwoodside, near Leeds.
1858		Ogilvie, Edward D., Esq. Yulgillar, Clarence-river, New South Wales. Care of Messrs. Marryat and Sons, Laurence Pountney-lane, E.C.
1875		Ogilvie, Geo. M., Esq. 14, St. James's-square, S.W.; and Raleigh Club, Regent-street, S.W.
1863		Ogilvy, Col. Thos. 23, Grafton-street, Piccadilly, W.; and Ruthven, Forfarshire, N. B.
1877		O'Halloran, Joseph Sylvester, Esq. 1, Whitehall-gardens, S.W.
1876		O'Keeffe,* Commr. Yelverton, R.N. 14, Avington-grove, Penge, S.E.
1873		Older, W. Aug., Esq. Carrington-lodge, Richmond.
1861		Oldershaw, Capt. Robert Piggott. St. Leonard's-lodge, Bedford-park, Croydon.
1874		Oldham, Surgeon-Major C.F. Care of Messrs. Grindlay and Co., 55, Parliament-street, S.W.
1870		Oldham, Henry, Esq., M.D. 4, Cavendish-place, W.
1855	C. p.	Oliphant, Laurence, Esq. Athenæum Club, S.W.
1878		Oliver, George, Esq. 10, Mincing-lane, E.C.
1866	p.	Oliver, Major S. P. (12th Brigade R.A.) 2, Eastern-villas, Anglesey, Gopfert, Hants; and Scientific Club, 7, Savile-row, W.
1877		Ommanney, Major Edward Lacon (Bengal Staff Corps). Woodville-house, Shooter's-hill-road, Blackheath, S.E.
1845	C. p.	Ommanney,* Admiral Sir Erasmus, C.B., F.R.S., F.R.A.S. The Towers, Yarmouth, Isle of Wight; and United Service Club, S.W.
1838		Ommanney,* H. M., Esq. Blackheath, S.E.



Year of Election.		
1867		Ormathwaite, John Benn-Walsh, Lord. 28, <i>Berkeley-square</i> , W.
1873		Ormerod,* Henry Mere, Esq. <i>Broughton-park</i> , Manchester.
1873		Orpen, F. H. S., Esq. <i>Care of A. H. Orpen, Esq.</i> , 33, <i>Anglesea-street</i> , Dublin.
1875		Orred, Chas. F. d'Angers, Esq. 4, <i>Albert-mansions</i> , <i>Victoria-street</i> , S.W.
1853		Osborn, Sir George R., Bart. <i>Travellers' Club</i> , S.W.; and <i>Chicksand-priory</i> , Beds.
1861		Osborne,* Lieut.-Col. Willoughby (Political Agent, <i>Bhopal</i> , <i>Schira</i> , <i>India</i> ).
1875		Osbourne, Jno. Smyth, Esq., jun. <i>Heath-house</i> , <i>Stapleton</i> , Bristol.
1852	C.	Oswell, William Cotton, Esq. <i>Groombridge</i> , Kent.
1877	P.	Otter, Baron Frederic von (Minister of Marine). <i>Care of Mr. Thorsten Nordenfolt</i> , 1, <i>St. Swithin's-lane</i> , E.C.
1875		Overall, Wm. Henry, Esq., F.S.A. <i>Guildhall</i> , E.C.
1870		Overbeck,* Baron de. <i>Hong-Kong</i> . <i>Care of Messrs. King and Co.</i> , 65, <i>Cornhill</i> , E.C.
1875		Overbury, E. N., Esq. (Madras Civil Service). 14, <i>St. James's-square</i> , S.W.
1844	C.	Overstone,* Samuel, Lord, M.A., M.R.I. 2, <i>Carlton-gardens</i> , S.W.; and <i>Wickham-park</i> , Surrey.
1873	P.	Oxenham, Edward Lavington, Esq. <i>Nutcombe-house</i> , <i>Weybridge</i> , Surrey.
1875		Oxley, Fredk., Esq. 23, <i>Gloucester-crescent</i> , <i>Hyde-park</i> , W.
1868		Owden, Sir Thomas S., Kut. <i>Mount-pleasant</i> , <i>Philip-lane</i> , <i>Tottenham</i> .
1874		Packe, William, Esq. 1, <i>Cavendish-square</i> , W.
1879		Paddon, Jno., Esq. <i>Barkly</i> , <i>Griqualand West</i> .
1873		Page, George Gordon, Esq., C.E. 4, <i>Great James-street</i> , <i>Gray's-inn</i> , W.C.
1878		Page, Henry, Esq. <i>Dulwich-common</i> , S.E.
1877		Page, Wm. Irving, Esq. <i>Wimbledon-common</i> , S.W.
1878		Paine, Geo. Wm., Esq. <i>Cotswold-lodge</i> , <i>Farquhar-road</i> , <i>Dulwich-wood-park</i> , <i>Upper Norwood</i> .
1878	T. p.	Palgrave, W. Gifford, Esq. <i>Care of Messrs. H. S. King and Co.</i> , <i>Cornhill</i> , E.C.
1876		Pallett,* Robt. Hy. Chas., Esq. <i>Theydon-hall</i> , <i>Theydon Bois</i> , Essex.
1870		Palmer, F. J., Esq., R.N. 50, <i>Finsbury-square</i> , E.C.
1879		Palmer, George, Esq. 58, <i>Ebury-street</i> , S.W.
1865		Palmer,* Captain George, R.N. <i>Midgard</i> , <i>Haueick</i> , <i>Roxburghshire</i> .
1870	P.	Palmer,* John Linton, Esq., Surg. R.N. 24, <i>Rock-park</i> , <i>Rockferry</i> , <i>Cheshire</i> .
1872		Palmer, Rev. Joseph, B.A., &c. <i>Wells</i> , <i>Somerset</i> .
1873		Palmer, J. Horsley, Esq. 56, <i>Cromwell-road</i> , <i>Queen's-gate</i> , S.W.
1838		Palmer,* Samuel, Esq.
1869		Palmer,* T. G. A., Esq. 5, <i>Paper-buildings</i> , <i>Inner Temple</i> , E.C.
1870		Pannel, Charles S., Esq. <i>Walton-lodge</i> , <i>Torquay</i> .
1865		Papengouth,* Oswald C., Esq., C.E. <i>Care of W. Hornibrook, Esq.</i> , 6, <i>Regent's-square</i> , W.C.
1863		Paris,* H.R.H. le Comte de.
1876		Parish,* Chas. Woodbine, Esq. <i>Quarry-house</i> , <i>St. Leonards-on-Sea</i> .
1849		Parish,* Admiral John E., R.N. 6, <i>Bina-gardens</i> , S.W.

Year of Election.		
1833	C. p.	Parish,* Sir Woodbine, K.C.H., F.R.S., &c. <i>Quarry-house, St. Leonards-on-Sea.</i>
1874		Park, Abraham, Esq. <i>Warrington-terrace, Ashton-under-Lyne; and Morningdale-house, Renfrewshire, N.B.</i>
1873		Park, James Dickson, Esq. 48, <i>Queen's-gate-gardens, South Kensington, S.W.</i>
1866		Parker, Capt. Francis G. S. (54th Regiment), F.O.S., A.I.C.E. <i>Reculver-villa, Bettinge, Herne-bay.</i>
1875		Parker,* Honourable Francis. 94, <i>Eaton-square, S.W.; and 9, King's-Bench-walk, Temple, E.C.</i>
1873		Parker, James, Esq. <i>Care of Messrs. H. S. King and Co., 45, Pall-mall, S.W.</i>
1850	p.	Parkes, Sir Harry S., K.C.B. (H.M. Minister Plenipotentiary, &c., in Japan).
1873		Parkin, George Lewis, Esq. 22, <i>Park-lane, W.</i>
1877		Parkin, Thomas, Esq., M.A. 29, <i>Boulevard Haussmann, Paris. Care of Rev. John Parkin, Hulton-vicarage, Hastings.</i>
1850	C. p.	Parkyn,* Mansfield, Esq., F.R.S. <i>Arthur's Club, St. James's-street, S.W.</i>
1876		Parlane, Jas., Esq. <i>Appleby-lodge, Rusholme, Manchester.</i>
1877		Parr, Commander Alfred A. Chase, R.N. <i>Powys-lodge, Bickley, Kent.</i>
1872		Parry, Edward, Esq. 290, <i>Camden-road, N.W.</i>
1872	p.	Parry,* Francis, Esq. 2, <i>Stanhope-gardens, Cromwell-road, S.W.</i>
1873		Pasco, Captain Crawford, R.N. <i>Care of Messrs. Case and Loudensack, 1, James-street, Adelphi, W.C.</i>
1874		Pass, Elias A. de, Esq. <i>The Lodge, Bembridge, Isle of Wight.</i>
1859		Pasteur, Marc Henry, Esq. 38, <i>Mincing-lane, E.C.</i>
1867		Paterson, John, Esq. 7 and 8, <i>Australian-avenue, E.C.</i>
1871		Patterson, Jas. Wilson, Esq. <i>Roseland, Waverley, Baltimore Co., U.S.A. Care of Messrs. Brönn, Shipley and Co., Lothbury, E.C.</i>
1875		Patterson, Myles, Esq.
1876		Patterson, Maj.-Gen. Wm. Thos. Laird. 6, <i>Spring-gardens, S.W.</i>
1863		Pattinson, J., Esq. 21, <i>Bread-street, E.C.</i>
1868		Paul, J. H., Esq., M.D. <i>The Terrace, Camberwell, S.E.</i>
1876		Pauli, Capt. W. B., R.N. (H.M. Consul, Porto Rico). <i>Care of Messrs. Woodhead and Co., 44, Charing-cross, S.W.</i>
1874		Paulson, W. H., Esq., B.A. <i>St. Lawrence-vicarage, Ramsgate.</i>
1872		Paxton, Robert Chas., Esq. 24, <i>Stafford-terrace, Phillimore-gardens, W.</i>
1877		Payne, Lieut.-Col. Geo. Massey. <i>East India United Service Club, 14, St. James's-square, S.W.</i>
1847		Paynter,* William, Esq., F.R.A.S. 21, <i>Belgrave-square, S.W.; and Camborne-house, Richmond, Surrey.</i>
1853		Peacock, George, Esq. <i>Starcross, near Exeter.</i>
1879		Peal, Samuel E., Esq. <i>Sapahattie, Nazeerah, Assam.</i>
1876		Pearcy, Joseph, Esq. 127, <i>Englefield-road, Islington, N.</i>
1877		Pearson, Arthur A., Esq. <i>Colonial-office, S.W.</i>
1874		Pechey, J. T. Primrose, Esq. <i>Leytonstone, Essex.</i>
1853		Peckover,* Alexander, Esq., F.L.S. <i>Wisebeck.</i>
1875		Peck,* Cuthbert E., Esq. <i>Wimbledon-house, S.W.</i>



Year of Election.		
1860		Peek,* Sir Henry William, Bart., M.P. <i>Wimbledon-house, S.W.</i>
1872		Peel,* Captain Francis. <i>Boxted-house, Colchester.</i>
1858		Peel, Right Hon. Sir Robert, Bart., G.C.B., M.P. 4, <i>Whitehall-gardens, S.W.</i> ; and <i>Drayton-manor, Tamworth.</i>
1874		Pelham,* Hon. Arthur L. <i>Stanmer, Lewes, Sussex.</i>
1875	P.	Pelly,* Colonel Sir Lewis, K.C.B., K.C.S.I. <i>Athenæum Club, Pall-mall, S.W.</i>
1875		Pelly, Capt. Richard W., R.N. <i>Trinity House, Tower-hill, E.C.</i> ; and <i>Holme-croft, Walthamstow, E.</i>
1871		Pembroke, Right Hon. George R. C. Herbert, Earl of. <i>Wilton-house, Salisbury</i> ; and 10, <i>Victoria-square, Piccadilly, S.W.</i>
1875		Pender, Staff-Comm. D., R.N. <i>Admiralty, Whitehall</i> ; and <i>Esquimaux, Thornton-hill, Wimbledon, S.W.</i>
1874		Pender, H. D., Esq. 18, <i>Arlington-street, S.W.</i>
1868		Pender,* John, Esq. 18, <i>Arlington-street, S.W.</i>
1879		Pengelly, Thomas, Esq. <i>Saint Keverne, Cornwall.</i>
1863		Pennant,* Colonel S. S. Douglas. <i>Penrhyn-castle, Bangor.</i>
1859		Penrhyn,* Lord. <i>Penrhyn-castle, Bangor.</i>
1874		Pepys, Hon. Walter Courtenay. <i>Windham Club, St. James's-square, S.W.</i>
1860		Pereira, Francisco E., Esq.
1865		Perkins, William, Esq. <i>Rosario, Argentine Republic.</i>
1878		Perry, Right Rev. Charles. 32, <i>Avenue-road, N.W.</i>
1859		Perry, Sir Erskine (Member of the Council of India). 36, <i>Eaton-place, S.W.</i>
1865	P.	Perry, Gerald R., Esq. <i>British Consulate, Cadiz.</i>
1876		Petch, Richd., Esq. 16, <i>Westbourne-park, Hyde-park, W.</i>
1857		Peters,* William, Esq.
1860	P.	Petherick,* John, Esq. 66, <i>Tavistock-crescent, Westbourne-park, W.</i>
1860		Petrie, Major Martin (97th Regiment). <i>Hanover-lodge, Kensington-park, W.</i>
1871		Petter, G. Wm., Esq. <i>Streatham-grove, S.W.</i>
1866		Pharazyn, Robert, Esq. <i>Wellington, New Zealand.</i> Care of Messrs. <i>Scale and Rogers, 9, Fenchurch-street, E.C.</i>
1867		Phayre, Lieut.-Gen. Sir Arthur, C.B., K.C.S.I. Care of Messrs. <i>H. S. King and Co., 45, Pall-mall, S.W.</i> ; and <i>E. India United Service Club, S.W.</i>
1862		Phené,* John Samuel, Esq., LL.D., F.S.A., F.G.S. 5, <i>Carlton-terrace, Oakley-street, S.W.</i>
1879		Phibbs, Owen, Esq. Care of W. <i>Phibbs, Esq., Seafeld, Co. Sligo, Ireland.</i>
1873		Philbrick,* Frederick Adolphus, Esq. 28, <i>Avenue-road, N.W.</i>
1860		Philip, George, Esq. 32, <i>Fleet-street, E.C.</i>
1872		Philipps, Herbert Rees, Esq. <i>India-office, S.W.</i>
1872		Philipps, Sutherland Rees, Esq., M.D. <i>Wonford-house, Exeter.</i>
1857		Phillimore, Rear-Admiral Augustus. <i>Shedfield, Fareham, Hants</i> ; and <i>India United Service Club, S.W.</i>
1859		Phillimore, Charles Bagot, Esq. <i>Hurley Manor-house, Great Marlborough</i> ; and <i>India-office, S.W.</i>

Year of Election.		
1878		Phillimore, Capt. Henry B., R.N., C.B. 1, <i>Crosthwaite-park West, Kingstown, Ireland.</i>
1860		Phillimore, Capt. Wm. Brough (Grenadier Guards). 7, <i>Hyde-park-gardens, W.</i>
1854		Phillips, Major-General Sir B. Travell, Knt. <i>United Service Club, S.W.</i>
1869		Phillips, Edw. Aug., Esq.
1873	p.	Phillips, Geo. Esq. (H.M. Consul, <i>Kinkiang</i> ). <i>Care of Jno. Marsh, Esq., 29, High-street, Maitstone.</i>
1877		Phillips, Thomas Ernest, Esq. <i>St. Mary's School, Seymour-street, Euston-square, N.W.</i>
1875		Phillips-Wolley, C. L., Esq.
1873		Philp, Capt. Fras. Lamb (Royal Scots Greys). <i>Pendoggett, Tinsbury, near Bath; and Army and Navy Club, S.W.</i>
1871		Philpott, Edward P., Esq., M.D., LL.D. <i>Poole, Dorsetshire.</i>
1878		Phipson-Wybrauts, Temple Leighton, Esq., J.P. 14, <i>Portsea-place, Hyde-park, W.; and Dunlow, Moy, Co. Tyrone, Ireland.</i>
1872		Pickering,* John, Esq. <i>The Abnalls, Mount Preston, Leeds.</i>
1871		Pickersgill, Wm. Cunliffe, Esq. 58, <i>Prince's-gate, S.W.</i>
1878		Pierce, Edwin, Esq. <i>Gwadur, Persian Gulf. Care of Messrs. King and Co., 65, Cornhill, E.C.</i>
1875		Pierce, John Timbrell, Esq. 3, <i>Middle Temple-lane, Temple; Frettons, Danbury, Chelmsford; and Reform Club, S.W.</i>
1871		Pierce, Josiah, Esq. 12, <i>Beaufort-gardens, Brompton-road, S.W.</i>
1870		Pigott, Robt. Turtle, Esq., D.C.L. <i>Manor-park, Lee, Kent; and 36, Southampton-street, Strand, W.C.</i>
1874		Pigott, Thomas Digby, Esq. <i>War-office, Pall-mall, S.W.</i>
1864		Pigou,* F. A. P., Esq. <i>Dartford, Kent.</i>
1852		Pike,* Captain John W., R.N. 116, <i>Holland-road, Kensington, W.</i>
1855		Pilkington, James, Esq. <i>Blackburn.</i>
1852	p.	Pim,* Captain Bedford C. T., R.N., M.P. <i>Leaside, Kingswood-road, Upper Norwood, S.E.; 2, Crown-office-row, Temple, E.C.; and Senior and Junior United Service Clubs, S.W.</i>
1870		Pimblett, Rev. James. 26, <i>Great Avenham-street, Preston.</i>
1859		Pinney, Colonel William. 30, <i>Berkeley-square, W.</i>
1879		Pirkis, Albert E., Esq. <i>Penlee, Richmond, Surrey.</i>
1879		Pirkis, Fredk. E., R.N. <i>Penlee, Richmond, Surrey.</i>
1877		Pitcairn, Cecil Colvin, Esq., B.A. <i>New University Club, St. James's-street, S.W.</i>
1877		Pitman, C. E., Esq. <i>Government Telegraph Department, Bengal.</i>
1872		Plaister, W. H., Esq., M.R.C.S., &c. <i>Tottenham, Middlesex.</i>
1871		Platt, Colonel Chas. Rowley. 4, <i>Bolton-street, Piccadilly, W.</i>
1865		Player, John, Esq. 22, <i>Carpenter-road, Edgbaston, Birmingham.</i>
1860	p.	Playfair, Lieut.-Col. Robert Lambert (H.B.M. Consul-General, <i>Algiers</i> ). <i>Care of Messrs. H. S. King and Co., 45, Pall-mall, S.W.</i>
1856		Plowes,* John Henry, Esq. <i>York-terrace, 39, Regent's-park, N.W.</i>



Year of  
Election.

1875		Plunkett,* Capt. Geo. T., R.E. <i>Chatham. Care of Messrs. Cox and Co., Craig's-court, S.W.</i>
1878		Poland,* Jno., Esq. <i>Eliot-cave-house, Blackheath.</i>
1873		Pollard, Henry Thos., Esq. 4, <i>Threadneedle-street, E.C.</i>
1855		Pollexfen,* Captain J. J. <i>India.</i>
1866		Pollington,* John Horace, Viscount. 8, <i>John-street, Berkeley-square, W.</i>
1835		Ponsonby,* The Hon. Frederick G. B. 3, <i>Mount-street, Grosvenor-square, W.</i>
1870		Poole, C. M., Esq., C.E. <i>Care of W. T. Poole, Esq., Carnarvon.</i>
1877		Poole, Capt. Wm. John E. (60th Royal Rifles). 9, <i>Granville-park, Lewisham, S.E.</i>
1857		Pope, Captain Wm. Agnew. <i>Union Club, Trafalgar-square, S.W.</i>
1874		Porges,* Theodore, Esq. 57, <i>Grosvenor-street, Grosvenor-square, W.; and Austin Friars, E.C.</i>
1871		Portal,* Wm. Richd., Esq., M.A. <i>Tonge-house, Lower Norwood, S.E.</i>
1877		Porter, Henry, Esq. 181, <i>Strand, W.C.</i>
1874		Potter, Richard, Esq. <i>Standish-house, Stonehouse, Gloucestershire.</i>
1878		Pottery Rev. Wm. <i>Emerald-hill, near Melbourne.</i>
1867		Potter, Wm. H., Esq. <i>Care of G. T. White, Esq., Kinrara, Tooting-common.</i>
1861		Founden,* Captain Lonsdale. <i>Junior United Service Club, S.W.; and Brouns-wood, Co. Wexford.</i>
1862		Povab, Rev. John V., M.A. 11, <i>Dawson-place, Pembroke-square, W.</i>
1878		Powell, Frederick, Esq. <i>Trent-college, Nottingham.</i>
1864		Powell,* F. S., Esq. 1, <i>Cambridge-square, Hyde-park, W.</i>
1874		Power, Edward, Esq. 16, <i>Southwell-gardens, South Kensington, S.W.</i>
1859		Power, E. Rawden, Esq. <i>Heywood-lodge, Tenby, South Wales; and Thatched-House Club, S.W.</i>
1868		Pownall, John Fish, Esq. 63, <i>Russell-square, W.C.</i>
1864		Powys, The Hon. Leopold. 16, <i>Queensberry-place, S.W.</i>
1870		Prance,* Reginald H., Esq. <i>Frogna, Hampstead.</i>
1873		Preedy, Col. H. William. <i>The Chantry, Fladbury, near Pershore, Worcestershire.</i>
1873	p.	Prevost,* Admiral J. C. 44, <i>South Eaton-place, S.W.</i>
1868		Price, Charles S., Esq. <i>Bryn Derwen, Neath.</i>
1869		Price, F. G. H., Esq. 1, <i>Fleet-street, E.C.</i>
1869		Price, James, Esq. 8, <i>Howley-place, Maid-a-hill West.</i>
1852		Price, James Glenie, Esq. 14, <i>Clement's-inn, W.C.</i>
1873		Price,* J. M., Esq., C.E.
1876		Price, Sir Rose Lambert, Bart. <i>Naval and Military Club, Piccadilly, W.</i>
1878		Price, Thomas Phillips, Esq. 41, <i>Conduit-street, W.</i>
1877		Prichard, Edward Ellison, Esq. <i>Post-office, Zanzibar. Care of A. Prichard, Esq., 27, Bedford-row, W.C.</i>
1860		Prickett,* Rev. Thomas William, M.A., F.S.A. 11, <i>Lypiatt-terrace, Cheltenham; and United University Club, Pall-mall East, S.W.</i>
1868	p.	Prideaux, Colonel W. F., Bombay Staff Corps. 2, <i>Sidlaw-terrace, Bognor, Sussex.</i>
1879		Pridham, Wm. J., Esq. <i>St. James's-school, Teignmouth, Devon.</i>
1877		Prince, John, Esq. <i>Devonshire Club, St. James's-street, S.W.</i>

Year of Election.	
1873	Prince, John Sampson, Esq. 34, <i>Craven-hill-gardens, Hyde-park, W.</i>
1865	Pringle,* A., Esq. <i>Fair, Selkirk, N. B.</i>
1879	Pringle, Edw. Hamilton, Esq. <i>Care of Messrs. Wheatley and Co., 156, Leadenhall-street, E.C.; and Scientific Club, 7, Savile-row, W.</i>
1878	Pringle, Major Sir Norman Wm. Drummond, Bart. <i>Curragh-camp, Ireland.</i>
1855	Pringle,* Thomas Young, Esq. <i>Reform Club, S.W.</i>
1866	Prinsep,* Edw. Aug., Esq., B.C.S. (Commissioner of Settlements in the Punjab, <i>Umritsur</i> ). <i>Care of Messrs. H. S. King and Co., 65, Cornhill, E.C.</i>
1868	Pritchard, Lieut.-Col. Gordon Douglas, R.E. <i>Montague-road, Richmond; and United Service Club, Pall-mall, S.W.</i>
1874	Probyn, Maj.-General Sir Dighton Macnaughten, V.C., K.C.S.I., C.B. <i>The Garden-mansions, Queen Anne's-gate, S.W.</i>
1874	Procter, Jno., Esq. <i>Cromwell-house, Long Preston, Leeds; and 2, Crown-office-row, Temple, E.C.</i>
1872	Proctor, Samuel, Esq. (Head Master, Borough Schools, San Fernando, <i>Trinidad</i> ). <i>Care of E. H. Penney, Esq., 17, Lime-street, E.C.</i>
1866	Proctor-Sims,* Richard, Esq., C.E. (Exec. Engineer, <i>Bhownaggar, Kattywar</i> ). <i>Care of J. R. Manning, Esq., 7, Westminster-chambers, S.W.</i>
1861	Prodgers,* Edwin, Esq. <i>The Rectory, Ayott St. Peter's, Herts.</i>
1874	Protheroe, Capt. Montague. <i>Care of Messrs. Grindlay and Co., 55, Parliament-street, S.W.; and Junior United Service Club, S.W.</i>
1874	Protheroe, Pryse, Esq. <i>Gothic-cottage, Adelaide-road, Surbiton.</i>
1877	Prouse, Oswald Milton, Esq. <i>Westbourne-house, Shaftesbury-road, Hammer-smith, W.</i>
1852	Prout, John William, Esq., M.A. <i>Athenæum Club, S.W.; and Neasdon, Middlessex, N.W.</i>
1878	Pryce, Capt. Chas. E. (Supt. Board of Trade). <i>"The Park," Hull.</i>
1874	Pryor, Rev. Jno. Eade. <i>Bennington-rectory, Stevenage, Herts.</i>
1878	Puckle, Major-General James. 9, <i>Charlotte-street, Brighton.</i>
1862	Puget,* Lieut.-Colonel J. <i>Aldershot-park, Aldershot, Hants.</i>
1872	Puleston, John H., Esq. 2, <i>Bank-buildings, Princes-street, E.C.</i>
1860	Puller, Arthur Giles, Esq. <i>Athenæum Club, S.W.; Arthur's Club, S.W.; and Youngsbury, Ware.</i>
1876	Pullman, Henry, Esq. <i>"Normandy," Kew-road, Richmond.</i>
1876	Pullman, Jno., Esq. <i>Grove-end, Chiswick.</i>
1872	Punsfer, Wm. B., Esq.
1869	Purdon, Lieut. George Frederic, R.N. <i>Tinenara, Killaloe, Co. Clare.</i>
1865	Pusey,* Sidney E. Bouverie, Esq.
1870	Pycroft, Sir Thomas, K.C.S.I. 17, <i>Cleveland-gardens, Hyde-park, W.</i>
1861	Quin, Lord George. 15, <i>Belgrave-square, S.W.</i>
1879	Quin, Geo., Esq. <i>Worcester, Cape-town. Care of Messrs. White and Holmes, 20, Mildmay-chambers, Bishopsgate-street-within, E.C.</i>
1862	Quin, John Thomas, Esq. <i>Care of Mr. Jno. B. Williams, 36, Hillmarton-road, Camden-road, N.</i>



Year of Election.		
1871		Radcliffe, Sir Joseph P., Bart.
1858		Radstock,* Granville Augustus, Lord. <i>East Sheen, S.W.</i>
1869		Rae, Edward, Esq. <i>Devonshire-road, Birkenhead.</i>
1876		Rae, Henry, Esq. 15, <i>Old-square, Lincoln's-inn, W.C.; and Oxford and Cambridge Club, Pall-mall, S.W.</i>
1862		Rae,* James, Esq. 32, <i>Phillimore-gardens, Kensington, W.</i>
1853	G. C. p.	Rae, John, Esq., M.D., LL.D. 2, <i>Addison-gardens South, Holland-villas-road, Kensington, W.</i>
1876		Rae, John, Esq., F.S.A. 9, <i>Mincing-lane, E.C.</i>
1875		Rahles, Chevalier John. 103, <i>Camden road, N.W.</i>
1870		Raikes, Francis Wm., Esq. <i>Junior Carlton Club.</i>
1867		Raleigh, Rev. A., D.D. 27, <i>Ladbroke-grove, W.</i>
1871		Ralli, Eustratius, Esq. 93, <i>Lancaster-gate, W.</i>
1871		Ralli, Pandeli, Esq. 17, <i>Belgrave-square, S.W.</i>
1873		Rambaut, John, Esq., M.D. <i>The Grange, Godstone, Surrey.</i>
1866		Ramsay, Alex., Esq. <i>Kilmorye-lodge, Castlebar, Ealing, W.</i>
1873		Ramsay, F. W. Hutchinson, Esq., M.D. 15, <i>Somerset-street, Portman-square, W.</i>
1867		Ramsay, John, Esq. <i>Islay, N. B. ?</i>
1875		Ramsay, Major John. <i>Straloch, Aberdeenshire.</i>
1867		Ramsden,* Richard, Esq., B.A.
1869		Randell,* Rev. Thomas, B.A. 12, <i>Victoria-street, Taunton.</i>
1878		Randolph, Vice-Admiral George G., C.B. 70, <i>Brunswick-place, Brighton; and United Service Club, Pall-mall, S.W.</i>
1874		Rankin, Capt. Fras. W. <i>Northwick-villa, Clifton, Gloucestershire; and Junior Naval and Military Club, Pall-mall, S.W.</i>
1868		Rankin, William, Esq.
1866		Ransom,* Edwin, Esq. <i>Kempstone, near Bedford.</i>
1876		Rapier, Richard C., Esq., C.E. 5, <i>Westminster-chambers, S.W.</i>
1869	p.	Rassam, Hormuzd, Esq. <i>Nineveh-house, Spring-grove, Isleworth.</i>
1859		Ratcliff, Colonel Charles, F.S.A. <i>Athenaeum Club, S.W.; Edgbaston, Birmingham; and Downing College, Cambridge.</i>
1861		Rate, Lachlan Macintosh, Esq. 9, <i>South Audley-street, W.</i>
1873		Ravenscroft, W. H., Esq. <i>Care of Sir C. McGregor and Co., 25, Charles-street, St. James's-square, S.W.</i>
1859		Ravenstein, Ernest G., Esq. <i>Alpha-cottage, Lorn-road, Brixton, S.W.</i>
1875		Rawlings, H. D., Esq., F.G.S., Netherlands. <i>Chalk-hill, Kingsbury, N.W.</i>
1875		Rawlins, Wm. Donaldson, Esq., M.A. 4, <i>Wimpole-street, Cavendish-square, W.</i>
1861	c.	Rawlinson, Sir Christopher. 82, <i>Eaton-place, S.W.; and The Lawn, Swindon.</i>
1844	PRES.	Rawlinson,* Major-General Sir Henry C., K.C.B., D.C.L., LL.D., F.R.S. <i>Athenaeum Club, S.W.; and 21, Charles-street, Berkeley-square, W.</i>
1874	G. p.	Rawson, Christopher, Esq. <i>Rickford's-hill, Aylesbury.</i>
1876		Rawson, Philip, Esq. <i>Woodhurst, Craxley, Sussex.</i>

Year of  
Election.

C.

- 1838 Rawson, Sir Rawson Wm., K.C.M.G., C.B. *Drayton-house, West Drayton, Middlesex.*
- 1875 Rawson, Lieut. Wyatt, R.N. *Rickford's-hill, Aylesbury.*
- 1869 Ray, Major Alfred William. *The Lodge, Brixton-oval, S.W.*
- 1872 Ray, Surgeon-General George H., M.D. *Junior United Service Club, Charles-street, S.W.*
- 1874 Rayleigh,\* Lord. *Terling-place, Witham, Essex.*
- 1873 Read, Frederick, Esq. 45, *Leinster-square, W.*
- 1874 Read, F. W. C., Esq. 17, *Colcherne-road, S. Kensington, S.W.*
- 1877 Read, Gen. John Meredith (Minister of the U.S. in Greece). *Athens. Care of B. F. Stevens, Esq., 4, Trafalgar-square, S.W.*
- 1879 Reay, Lord. 6, *Great Stanhope-street, W.*
- 1865 Redhead, R. Milne, Esq., F.L.S. *Springfield, Seedley, Manchester; Conservative Club, S.W.; and Junior Carlton Club, S.W.*
- 1868 Redman,\* John B., Esq., C.E. 25, *Great George-street, S.W.*
- 1871 Reed, Andrew Holmes, Esq. *Strathern, Amhurst-park, Stamford-hill.*
- 1877 Reed, John William, Esq. 27, *Clarence-street, Islington, N.*
- 1866 Rehden,\* George, Esq. 59, *Mark-lane, E.C.*
- 1877 Reid, Alexander, Esq. *Georgetown, British Guiana. Care of the Colonial Bank, 8, Bishopsgate-street, E.C.*
- 1861 Reid,\* David, Esq.
- 1861 Reilly, Anthony Adams, Esq. 1, *Paper-buildings, Temple, E.C.*
- 1869 Reiss,\* James, Esq. 7, *Cromwell-road-houses, South Kensington, S.W.*
- 1877 Remfry, Frederick Ernest, Esq. *Firsleigh, Torquay.*
- 1872 Remfry, Jno., Esq. *The Grange, Nightingale-lane, Clapham-common, S.W.*
- 1866 Rennie,\* John Keith, Esq., M.A. Camb. 2, *Eccleston-square, S.W.*
- 1877 Rennie, John Thomson, Esq. 6, *East India-acenue, E.C.; and Deemount-house, Aberdeen.*
- 1834 Rennie,\* M. B., Esq., C.E. *Care of James Rennie, Esq., 9, Motcomb-street, Belgrave-square, S.W.*
- 1864 Rennie, W., Esq. 6, *Great Cumberland-place, W.*
- 1877 Renshaw, Chas. B., Esq. *Elderslie, Renfreeshire, N. B.*
- 1830 Renwick,\* General W. F., R.E. 21, *Bassett-road, Notting-hill, W.*
- 1861 Reuter, Julius, Baron de. *Kensington-palace-gardens, W.*
- 1858 Reynardson, Henry Birch, Esq. *Adwell, near Tetworth, Oxfordshire.*
- 1872 Reynolds, William Henry, Esq. *Care of Messrs. King and Co., 65, Cornhill, E.C.*
- 1867 Rhodes, Arthur John, Esq. *Sunnyside, St. Albans.*
- 1874 Rhodes, Hon. Wm. Barnard (Mem. Legis. Council, New Zealand). *Wellington, New Zealand. Care of Messrs. Jas. Morrison and Co., 4, Fenchurch-street, E.C.*
- 1863 Ricardo-Seaver,\* Major F. Ignacio. *Conservative Club, St. James's, S.W.*
- 1870 Rice, Wm., Esq. *Messrs. William Collins, Son and Co., Bridewell-place, New Bridge-street, E.C.*
- 1868 Richards, Alfred, Esq. *Tenchesbury-lodge, Forest-hill.*



Year of Election.		
1874		Richards, Capt. F. W., R.N. <i>United Service Club</i> ; and <i>H.M.S. 'Devastation,' Channel Squadron.</i>
1857	C. p.	Richards, Admiral Sir George H., C.B., F.R.S. <i>Vancouver-house, Forest-hill, S.E.</i>
1877		Richards, M. W. Esq. <i>Shore-road, S. Hackney, E.</i>
1877		Richardson, Edwin J., Esq. 28, <i>Duke-street, Manchester-square, W.</i>
1864		Richardson, F., Esq. <i>Juniper-hall, Mickleham, Dorking.</i>
1873		Richardson, W. Brown, Esq. <i>Darlaston-rectory, Wednesbury, Staffordshire.</i>
1875		Rider, T. F., Esq. <i>The Grove, Clapham-road, S.W.</i>
1873		Riddell, Lieut. H. S. Hutton (2nd Battalion 60th Rifles). <i>Meerul.</i>
1876		Rideal, John, Esq. <i>Devon-lodge, Mayow-road, Forest-hill.</i>
1877		Ridgway, John Ambrose, Esq. <i>Foundation School, Beverley.</i>
1864		Ridley, F. H., Esq.
1864		Ridley, George, Esq. 2, <i>Charles-street, Berkeley-square, W.</i>
1874		Ridpath, James Lionel, Esq. <i>Devon-lawn, Wimbledon-park.</i>
1875		Ridpath, Thomas Alex., Esq. 9, <i>Belsize-park, Hampstead.</i>
1862	C. p.	Rigby,* Major-General Christopher Palmer. <i>Oriental Club, W.; and 14, Mansfield-street, W.</i>
1868		Riley, Captain Charles Henry. <i>Junior United Service Club, S.W.</i>
1879		Rimmel, Eugene, Esq. <i>Strand, W.C.</i>
1860		Rintoul, Robert, Esq. <i>Windham Club, S.W.</i>
1853	PRES.	Ripon, Most Hon. Geo. Fredk Sam., Marquis of, K.G., F.R.S. 1, <i>Carlton-gardens, S.W.; and Studley Royal, Ripon.</i>
1874		Ritchie, Rev. George St. Martin (Chaplain to the Forces).
1877		Robarts, H. C., Esq. 41, <i>Lowndes-square, S.W.</i>
1876		Roberts, Rev. Chas. M. <i>The Grammar-school, Monmouth.</i>
1868		Roberts,* Charles W., Esq. <i>Penrith-house, Eifra-road, Brixton, S.W.</i>
1875		Roberts, W. C., Esq. <i>New Zealand.</i>
1874		Robertson, A. D., Esq. 53, <i>Queen's-gate, S.W.</i>
1860		Robertson, Sir D. Brooke, C.B. (H.M. Consul-General, <i>Shanghai</i> ). <i>Athenaeum Club, S.W.</i>
1875		Robertson, D. I. U., Esq. 174, <i>Chatham-street, Falkner-square, Liverpool.</i>
1861		Robertson,* Graham Moore, Esq. 21, <i>Cleveland-square, Hyde-park, W.</i>
1877		Robertson,* Henry, Esq., M.P. 13, <i>Lancaster-gate, W.; and Pali-hall, Correen, N. Wales.</i>
1870		Robertson,* James Nisbet, Esq. <i>Yeolands, Banstead, Surrey.</i>
1863		Robertson, R. B., Esq. (H.M. Consul, <i>Yokohama, Japan</i> ).
1873		Robertson, Major Wheatley. 35, <i>Queen's-gardens, W.</i>
1870		Robinson, Alfred, Esq. <i>Elm-bank, Huddersfield.</i>
1875	*	Robinson,* Arthur M., Esq. 32, <i>Devonshire-road, Cloughton, Birkenhead.</i>
1873		Robinson, Capt. F. C. B., R.N. <i>Care of London Joint Stock Bank, Pall-mall, S.W.</i>
1872		Robinson, Henry, Esq., M.L.C.E., F.G.S. 7, <i>Westminster-chambers, S.W.</i>
1859		Robinson, Sir Hercules G. R., G.C.M.G., Governor of New Zealand. <i>Messrs. Burnett, 17, Surrey-street, W.C.</i>

Year of Election.		
1878		Robinson, James, Esq. <i>Dulwich-college, Dulwich.</i>
1884		Robinson, John, Esq. <i>Care of E. Street, Esq., 30, Cornhill, E.C.</i>
1874		Robinson, John, Esq., C.E. <i>Newick, Lewes.</i>
1865		Robinson, J. R., Esq., LL.D., F.S.A. Scot., F.G.S. Edin. 597, <i>Westgate, Deansbury.</i>
1862		Robinson, Colonel Sir John Stephen, Bart. <i>Arthur's Club, S.W.</i>
1860		Robinson, Mr. Serjeant (B.C.). 43, <i>Mecklenburgh-square, W.C.</i>
1878		Robinson, Vincent Joseph, Esq. 34, <i>Weymouth-street, W.</i>
1850		Robinson,* Captain Walter F., R.N. 15, <i>Montpellier-villas, Brighton.</i>
1872		Robinson, Wm., Esq., C.M.G. <i>Colonial-office, S.W.</i>
1870		Robinson, Sir W. C. F., K.C.M.G., Governor of the Straits Settlements. <i>Care of Colonial-office, S.W.</i>
1858		Rochester, Right Rev. A. W. Thorold, Bishop of. <i>Selsdon-park, Croydon; and Athenæum Club, S.W.</i>
1830		Rodd,* James Rennell, Esq. 29, <i>Beaufort-gardens, S.W.</i>
1874		Rogers, Captain Ebenezer. <i>S.O.P., Chester.</i>
1877		Rogers, Edward C., Esq. <i>Three Counties Asylum, Stotfold, Baldock.</i>
1863		Rogers, John T., Esq. <i>River-hill, Sevenoaks.</i>
1874		Rogerson, Geo. Russell, Esq., F.R.A.S. <i>Beech-cottage, Calderstone-road, Allerton, near Liverpool.</i>
1861		Rollo, Lord. <i>Dumcrieff-castle, Moffat, N. B.</i>
1866	P.	Rooke, Major W., R.A. <i>Formosa, Lymington, Hants.</i>
1871		Rooks, Geo. Arthur, Esq. 12, <i>Bloomsbury-square, W.C.</i>
1868		Rose, Henry, Esq. 8, <i>Porchester-square, Hyde-park, W.</i>
1872		Rose, H. Cooper, Esq., M.D. <i>Hampstead, N.W.</i>
1861		Rose, Jas. Anderson, Esq. <i>Wandswoorth, Surrey, S.W.; and 11, Salisbury-street, W.C.</i>
1870		Rose, The Right Hon. Sir John, Bart., K.C.M.G. 18, <i>Queen's-gate, Hyde-park, S.W.</i>
1857		Rose,* Colonel Sir Wm. Anderson, Alderman, F.R.S.L. <i>Carlton Club, S.W.; 63, Upper Thames-street, E.C.; and Upper Tooting, S.W.</i>
1878		Rosenthal, Alfred Ephraim, Esq. <i>Care of J. D. Rosenthal, Esq., 10, Suffolk-street, Dublin.</i>
1876		Rosenthal, L., Esq. 10, <i>Delamere-terrace, N.W.</i>
1876	P.	Ross, Lieut.-Col. E. C. <i>Care of Messrs. Grindlay and Co., 55, Parliament-street, S.W.</i>
1870		Ross, Capt. Geo. Ernest Augustus. <i>Forfar-house, Cromwell-road, South Kensington, S.W.</i>
1878		Ross, Rev. Geo. Gould. <i>St. Andrew's College, Grahamstown.</i>
1864		Roundell,* C. S., Esq. 16, <i>Curzon-street, Mayfair, W.</i>
1864		Routh,* E. J., Esq., M.A., F.R.S., F.R.A.S., &c. <i>St. Peter's College, Cambridge.</i>
1874		Routledge, Edmund, Esq. 40, <i>Clanricarde-gardens, Bayswater, W.</i>
1876		Routledge, Thomas, Esq. <i>Claxheugh, Sunderland.</i>
1872		Row,* A. V. Nursing, Esq. <i>Daba-garden, Vizagapatam, India. Care of Messrs. King and Co., 65, Cornhill, E.C.</i>
1868		Rowlands,* Percy J., Esq. <i>India-office, S.W.</i>



Year of Election.		
1863		Rowley, Captain C., R.N. 33, <i>Cadogan-place, S.W.</i>
1856		Rucker, J. Anthony, Esq. <i>Blackheath, S.E.</i>
1876		Rudge, Wm. Newland, Esq. 17, <i>South Audley-street, W.</i> ; and <i>Ethyl-lawn, Torquay, Devon.</i>
1861		Rumbold,* Charles James Augustus, Esq. 5, <i>Percival-terrace, Brighton.</i>
1874		Rumbold, Capt. H. E. W. <i>Junior United Service Club, Charles-street, S.W.</i>
1861		Rumbold, Thomas Henry, Esq. 38, <i>Sussex-square, Brighton.</i>
1860		Rumley, Major-General Randal. 16, <i>Eaton-terrace, Eaton-square, S.W.</i>
1874		Rusden,* Geo. W., Esq. <i>Care of R. B. Otley, Esq., 39, Ladbroke-square, W.</i>
1858	C.	Russell,* Lord Arthur, M.P. 2, <i>Audley-square, W.</i>
1869		Russell, George, Esq., M.A. <i>Viewfield, Southfields, Wandsworth; and 16, Old Change, St. Paul's, E.C.</i>
1875		Russell, Peter N., Esq. <i>Junior Carlton Club, Pall-mall, S.W.</i>
1875		Russell,* Robert, Esq. 42, <i>Albemarle-street, W.</i>
1875		Russell, Thomas, Esq. <i>Haremere-hall, Hurstgreen, Sussex.</i>
1876		Russell, Thomas, Esq. 22, <i>Kensington-palace-gardens, W.</i>
1860		Russell, Wm. Howard, Esq., LL.D. <i>Carlton Club, S.W.</i>
1876		Rutherford,* David Greig, Esq. 1, <i>Belgrave-villas, Cotham-grove, Bristol.</i>
1860		Rutherford, John, Esq. 2, <i>Cavendish-place, Cavendish-square, W.</i>
1876		Rutson, Albert O., Esq. 7, <i>Half-Moon-street, W.</i>
1877		Rutson, John, Esq. <i>Newby Wiske, Thirst, Yorkshire.</i>
1873	P.	Ruxton, Captain W. Fitzherbert, R.N. 41, <i>Cornwall-gardens, S.W.</i>
1857	C.	Ryder,* Admiral Alfred P. 5, <i>Victoria-street, Westminster, S.W.</i>
1864		Ryder, G., Esq.
1873		Sabel, Ernest E., Esq. 185, <i>Maida-vale, W.</i>
1852	C. p.	Sabine, Lieut.-General Sir Edw., R.A., K.C.B., F.R.A.S., &c. 13, <i>Ashley-place, Victoria-street, Westminster, S.W.</i>
1875		Sadgrove, Arthur William, Esq. 64, <i>Mark-lane, E.C.; and Eltham, Kent.</i>
1874		St. Albans, His Grace The Duke of. <i>Bestwood-park, Arnold, Notts.</i>
1873		St. Clair, John, Esq. <i>Newton Stewart, Wigtownshire.</i>
1874		St. Jean, Le Vicomte Ernest de Satgé. <i>Malvern Wells; and Junior Athenæum Club.</i>
1867		St. John, Major Oliver Beauchamp Coventry, R.E., C.S.I. <i>Care of Messrs. H. S. King and Co., 65, Cornhill, E.C.</i>
1862	p.	St. John, Spenser, Esq., British Minister for Peru. 150, <i>Cambridge-street, Pinlipo, S.W.</i>
1863		Sale, Captain M. T., R.E. <i>Chatham.</i>
1867		Salkeld, Colonel J. C. (H.M. Indian Forces). 29, <i>St. James's-street, S.W.</i>
1868		Salles, J. de, Esq. 59, <i>Stanhope-gardens, South Kensington, S.W.</i>
1869		Salmond,* Robert, Esq. <i>Reform Club, S.W.; and Rankinston, Patna, Ayr.</i>

Year of Election.	
1875	Salomons,* Sir David, Bart. <i>Broom-hill, Tunbridge Wells; and 46, Upper Berkeley-street, W.</i>
1863	Salt,* Henry, Esq. <i>Egremont, Bournemouth.</i>
1875	Salthouse, Rev. Robert. <i>St. James's-parsonage, West Derby.</i>
1861	Sandbach,* Wm. Robertson, Esq. 10, <i>Prince's-gate, Hyde-park, S.W.</i>
1867	Sandeman, Captain David George. <i>The Ferns, Eldon-road, Kensington, W.</i>
1877	Sandeman,* Fleetwood, Esq. 15, <i>Hyde-park-gardens, W.</i>
1874	Sanderson, Rev. Edward. <i>The Vicarage, High Hurst Wood, Uckfield, Sussex.</i>
1877	Sandilands, John Alexander, Esq.
1862	Sanford, Lieut.-Colonel Henry Ayshford. 29, <i>Chester-street, Grosvenor-place, S.W.; and Nynehead-court, Wellington, Somerset.</i>
1870	Sanford, W. Ayshford, Esq., F.R.S. <i>Nynehead-court, Wellington, Somerset.</i>
1878	Sapp, John James, Esq. <i>Palmerston-road, Southsea.</i>
1860	P. Sarel, Colonel H. A., C.B., Assist.-Adj.-General S.E. District, <i>Dover; and United Service Club, Pall-mall, S.W.</i>
1869	Sarll, John, Esq. <i>Beauvoir-house, Hollington-park, St. Leonards-on-Sea.</i>
1860	Sartoris, Alfred, Esq. <i>Abbottswood, Stow-on-the-Wold.</i>
1852	Saumarez, Rear-Admiral Thomas, C.B. <i>The Firs, Jersey.</i>
1874	Saunders, Fras., Esq. 6, <i>Limes-grove, Lewisham, S.E.</i>
1874	Saunders, Howard, Esq. 7, <i>Radnor-place, Gloucester-square, W.</i>
1866	Saunders, James Ebenezer, Esq., F.L.S., F.G.S., F.R.A.S. 9, <i>Finsbury-circus; and Chelvestone, 36, Lee-terrace, Blackheath, S.E.</i>
1878	Savory, Major H. B. <i>Naval and Military Club, Piccadilly, W.</i>
1863	Sawyer, Colonel Charles (6th Dragoon Guards). 20, <i>Roland-gardens, S.W.</i>
1875	Schäfer,* Wm. Fredk., Esq. <i>Lydstep-house Highgate, N.</i>
1874	Schalch, Vernon Rodolph, Esq. 29, <i>Dorset-square, N.W.</i>
1861	Schenley, Edward W. H., Esq. 14, <i>Prince's-gate, S.W.</i>
1878	Schiff, Alfred G., Esq. <i>Santandrea, Cranford, near Hounslow.</i>
1874	Scholfield, William F., Esq. 55, <i>Onslow-gardens, S.W.</i>
1878	Schön, Rev. James Frederick. <i>Palm-house, Chatham, Kent.</i>
1870	Scobell, Sandford Geo. T., Esq. <i>Down-house, Red Marley, Gloucester.</i>
1875	Sconce, Gideon C., Esq. 14, <i>St. James's-square, S.W.</i>
1872	Scott, Abraham, Esq. 12, <i>Farguhar-road, Upper Norwood, S.E.</i>
1866	Scott, Adam, Esq. 10, <i>Knatchbull-road, Camberwell.</i>
1866	Scott, Arthur, Esq. <i>Rotherfield-park, Alton, Hants; and Travellers' Club, S.W.</i>
1879	Scott, Sir A. D., Bart. 97, <i>Eaton-square, S.W.</i>
1873	Scott,* Dugald, Esq. <i>The Moorlands, Kersal-edge, Manchester.</i>
1878	Scott, Major-General Edw. W. 33, <i>Brunswick-gardens, Campden-hill, W.</i>
1859	Scott, Lord Henry. 3, <i>Tilney-street, Park-lane, W.</i>
1861	Scott,* Hercules, Esq. <i>Brotherton, near Montrose, N.B.</i>
1877	Scott,* James Benjamin, Esq. 32, <i>Coal Exchange, City, E.C.; and Walthamstow.</i>
1875	Scott, John Charles A., Esq. 6, <i>Cambridge-gate, Regent's-park, N.W.</i>



Year of Election		
1877		Scott, Capt. P. A., R.N. <i>Care of W. T. Littlejohns, Esq., Royal Naval College, Greenwich, S.E.</i>
1878		Scott, Wm., Esq. <i>Hanover-square Club, W.</i>
1877		Scrutton, Alexander, Esq. 2, <i>Upper St. John's-park, Blackheath, S.E.</i>
1863		Scovell, George, Esq. 25, <i>Grosvenor-place, S.W.</i>
1873		Searight, Hugh Ford, Esq. 7, <i>East India-avenue, E.C.</i>
1861		Searight, James, Esq. 80, <i>Lancaster-gate, W.</i>
1879		Seaton, George, Esq. <i>East London Water-works, Old Ford, E.</i>
1867		Seaton, Maj.-Gen. Lord. D 3, <i>Albany, W.</i>
1869		Sedgwick, Jno. Bell, Esq. 1, <i>St. Andrew's-place, Regent's-park, N.W.</i>
1878	P.	Seeborn, Henry, Esq. 6, <i>Tenterden-street, Hanover-square, W.</i>
1876		Seeley, Harry G., Esq., F.L.S., F.G.S., &c. 61, <i>Adelaide-road, N.W.</i>
1877		Seely,* Charles, Esq., jun. 7, <i>Queen's-gate-gardens, South Kensington, S.W.:</i> <i>and Sherwood-lodge, Nottinghamshire.</i>
1876		Segrave, Capt. W. F. (H.M. Consul, Stockholm). <i>Care of the Librarian,</i> <i>Foreign-office, S.W.</i>
1858		Serocold,* Charles P., Esq. <i>Brewery, Liquorpond-street, E.C.</i>
1853	P.	Sevin, Charles, Esq. 155, <i>Fenchurch-street, E.C.</i>
1872		Sewell, Stephen A., Esq. 56, <i>Kensington-gardens-square, W.</i>
1867		Seymour, Alfred, Esq. 5, <i>Chesterfield-gardens, Mayfair, W.</i>
1872		Seymour,* Admiral Sir F. Beauchamp, K.C.B.
1873		Seymour,* Major-General W. H., C.B. <i>United Service Club, Pall-mall, S.W.</i>
1854		Shadwell,* Admiral Sir Charles F. A., K.C.B., F.R.S. <i>Meadow-bank, Melksham,</i> <i>Wilts.</i>
1860		Shadwell,* Lieut.-Colonel Lawrence.
1874		Shanks, Major Joseph G., R.M.L.I. <i>Plymouth, Devon.</i>
1856		Share,* Staff-Commander James Masters, R.N. <i>Mutley-park, near Plymouth,</i> <i>Devonshire.</i>
1873		Sharp,* Colin Kimber, Esq. 43, <i>Trejunter-road, West Brompton, S.W.</i>
1873		Sharp, Captain Cyril. 7, <i>Thurloe-square, S.W.</i>
1866		Sharp, Henry T., Esq. 8, <i>Park-lane, Mayfair, W.</i>
1875		Sharp, Thos. Clark, Esq.
1861		Sharpe,* William John, Esq.
1874		Shaw, C. Bousfield, Esq. 26, <i>Charles-street, St. James's;</i> and 2, <i>Essex-court,</i> <i>Temple.</i>
1876		Shaw, Geo., Esq. 7, <i>Garrick-street, W.C.;</i> and <i>Oakwood-house, Rostrevor,</i> <i>Ireland.</i>
1862		Shaw,* John, Esq. <i>Fineland, Otago, New Zealand. Care of Messrs. Reith</i> <i>and Wilkie, Dunedin, Otago, N.Z. Per Messrs. Sampson Low and Co.</i> <i>188, Fleet-street, E.C.</i>
1861		Shaw, John Ralph, Esq. <i>Arrowe-park, Birkenhead.</i>
1876		Shaw, W. Otho Nicholas, Esq.
1870		Shearme,* Edward, Esq. 94, <i>Regent's-park-road, N.W.</i>
1875		Shelley, Edward, Esq. <i>Avington, Winchester.</i>

Year of Election.		
1868		Shelley,* Captain G. Ernest. 32, <i>Chesham-place, S.W.</i>
1867		Shenstone, Fredk. Smith, Esq. <i>Sutton-hall, Barcombe, Leves.</i>
1875		Shepherd, Chas. Edwd., Esq., C.E. <i>Beaumont-house, Ealing.</i>
1867		Shepherd, Chas. Wm., Esq., M.A., F.Z.S. <i>Trotterscliffe, Maidstone.</i>
1878		Shepherd, James, Esq. 19, <i>Lancaster-gate, W.</i>
1860		Sheridan, H. Brinsley, Esq., M.P. <i>New City Club, E.C.</i>
1863		Sheridan, Richard B., Esq. 39, <i>Grosvenor-place, S.W.</i>
1857		Sherrin, Joseph Samuel, Esq., LL.D., PH.D. <i>Leyton-house, Leyton-crescent, Kentish-town, N.W.</i>
1877		Shillinglaw, John Joseph, Esq. <i>Melbourne, Victoria.</i>
1858		Shipley,* Conway M., Esq. <i>Twyford-moors, Winchester.</i>
1868		Shirley, Lionel H., Esq., C.E., &c. <i>Windham Club, S.W.; and 2, Storey's-gate, Westminster, S.W.</i>
1871		Shoolbred,* James, Esq. 38, <i>Lancaster-gate, Hyde-park, W.</i>
1873		Short, Robert, Esq. <i>Dighton-lodge, Highbury-new-park, N.</i>
1872		Shuter,* William, Esq. 66, <i>Belsize-park-gardens, Haverstock-hill, N.W.</i>
1876		Sibley,* George, Esq., C.E. <i>The Mount, Whitehill, Caterham, Surrey.</i>
1876		Sidney, Capt. Fred. W., R.N.
1869		Silk, George Chas., Esq.
1871		Sills,* Wm. Bernard, Esq.
1877		Siltzer, John, Esq. 4, <i>Cromwell-houses, South Kensington, S.W.</i>
1865		Silva,* Frederic, Esq. 97, <i>Westbourne-terrace, Hyde-park, W.</i>
1859		Silver, the Rev. Fred., M.A., F.R.A.S., F.G.S., F.L.S. <i>Rectory, Norton-in-Hales, Market Drayton, Salop.</i>
1859	C.	Silver,* Stephen Wm., Esq. 66, <i>Cornhill, E.C.; and 3, York-gate, Regent's-park, N.W.</i>
1878		Sim, Major Edward Coysgarne, R.E. <i>United Service Club, Pall-mall, S.W.</i>
1853		Simmons, Edw. R., Esq. <i>Nevill-house, Belgrave-terrace, Brighton.</i>
1848		Simmons,* General Sir John L. A., R.E., G.C.B. 36, <i>Cornwall-gardens, Kensington, S.W.</i>
1866		Simons, Henry M., Esq. <i>Tyersall-crescent, Wood-road, Sydenham-hill, S.E.</i>
1879		Simpson, Arthur T., Esq., C.E. <i>Chelsea Water-works, Pimlico, S.W.</i>
1864		Simpson, Frank, Esq. 17, <i>Whitehall-place, S.W.</i>
1863	p.	Simpson,* William, Esq. 64, <i>Lincoln's-inn-fields, W.C.</i>
1878		Simson,* Alfred, Esq. 4, <i>Fairlie-place, Calcutta.</i>
1879		Singleton, Jas. Edw., Esq. 30, <i>Lord-street, Barrow-in-Furness.</i>
1858		Skelmersdale, Right Hon. Edward, Lord. <i>Lathom-park, Ormskirk, Lancashire.</i>
1875	p.	Skertchly, Joseph A., Esq. 189, <i>Glenarm-road, Clapton-park, E.</i>
1873		Skilbeck, Jno. Hy., Esq. <i>The Hollies, Snaresbrook, Leytonstone, E.</i>
1866		Skinner, John E. H., Esq. 3, <i>Dr. Johnson's-buildings, Temple, E.C.</i>
1863		Skrine, Henry D., Esq. <i>Warleigh-mansion, near Bath.</i>
1871		Slade, Henry, Esq., Fleet-Surgeon, R.N. <i>Army and Navy Club, S.W.; and Royal Western Yacht Club, Plymouth.</i>



Year of  
Election.

1870	P.	Sladen, Col. E. B. <i>Care of Messrs. Grindlay and Co., 55, Parliament-street, S.W.</i>
1861		Sladen, Rev. Edward Henry Mainwaring. <i>The Gore, Bournemouth.</i>
1872		Smale, Sir John (Chief Justice, <i>Hong-Kong</i> ). 26, <i>Kensington-square, W.</i>
1865		Smedley, Joseph V., Esq., M.A. <i>Oxford and Cambridge Club, S.W.; and 34, St. George's-road, Kilburn.</i>
1871		Smetham, John Osborne, Esq. <i>King's Lynn, Norfolk.</i>
1860		Smith,* Augustus Henry, Esq. <i>The Ridge, Bitterne, Southampton.</i>
1875		Smith,* B. Leigh, Esq., M.A. <i>Oxford and Cambridge Club, Pall-mall, S.W.</i>
1876		Smith, Bridgman, Esq. 27, <i>Lloyd-square, W.C.</i>
1871		Smith, Major C. B. Euan, C.S.I. 14, <i>St. James's-square, S.W. Care of Messrs. King and Co., Cornhill, E.C.</i>
1875		Smith, David Murray, Esq. 20, <i>Oxford-street, Edinburgh.</i>
1859		Smith, Edward, Esq. <i>Windham Club, S.W.</i>
1877		Smith, E. Louis T., Esq. <i>Richmond-house, Hounslow.</i>
1873	P.	Smith, F. Porter, Esq., M.B. <i>Shepton Mallet, Somersetshire.</i>
1878		Smith,* George, Esq., LL.D. <i>Scramptown-house, Napier-road, Edinburgh.</i>
1871		Smith, Geo. Fereday, Esq., M.A., J.P., &c. <i>Grocehurst, Tenbridge Wells.</i>
1873		Smith, Griffiths, Esq. 7, <i>Endsleigh-street, Twickenham-square, W.C.</i>
1865		Smith, Guildford, Esq. 63, <i>Charing-cross, S.W.</i>
1861		Smith, Jervoise, Esq. 47, <i>Belgrave-square, S.W.</i>
1876		Smith, J. L. Clifford, Esq. <i>Upper Ford, Droitwich.</i>
1879		Smith, John, Esq. <i>Gravel-mount, Retford, Notts.</i>
1861		Smith,* Joseph Travers, Esq. 25, <i>Throgmorton-street, E.C.</i>
1857		Smith, Colonel Philip (Grenadier Guards). 6, <i>James-street, Buckingham-gate, S.W.</i>
1874		Smith,* R. Barr, Esq. <i>Torrens-park, Adelaide, S. Australia.</i>
1868		Smith,* Major Robert M., R.E. <i>Teheran.</i>
1874		Smith, Rupert, Esq. <i>Turner's-hill, near Dudley.</i>
1841		Smith,* Thomas, Esq.
1859		Smith,* W. Castle, Esq. 1, <i>Gloucester-terrace, Regent's-park, N.W.</i>
1859		Smith, Right Hon. William Henry, M.P. 1, <i>Hyde-park-street, W.</i>
1875		Smith, Wm. Hy., Esq. <i>Care of Messrs. Allan Bros. and Co., James-street, Liverpool.</i>
1875		Smith, William Howarth Glynn, Esq. 46, <i>Parliament-street, S.W.</i>
1857		Smith-Bosanquet,* Horace, Esq. 38, <i>Queen's-gate, South Kensington, S.W.</i>
1869		Smyth, Colonel Edmund. <i>Welwyn-grange, Herts.</i>
1869	C.	Smyth,* Warrington, Esq., F.R.S. 5, <i>Interness-terrace, W.</i>
1850		Smythe,* Lieut.-General William J., R.A., F.R.S. <i>Athenaeum Club, S.W.</i>
1872		Snook, William, Esq. 20, <i>Northampton-park, Canonbury, N.</i>
1876		Solbé, Edward, Esq. <i>Palace-groce, Bromley.</i>
1879		Solomon, C. S., Esq. <i>Care of Messrs. White and Holmes, 20, Mildmay-chambers, Bishopgate-street, E.C.</i>
1865		Solomons,* Hon. George. <i>Jamaica.</i>

Year of Election.		
1839	C.	Somers,* Right Hon. Charles, Earl. 4, <i>Chesterfield-gardens</i> , W.; <i>Eastnor-castle</i> , <i>Herefordshire</i> ; and <i>The Priory</i> , <i>Reigate</i> , <i>Surrey</i> .
1862		Somerset, Capt. Leveson E. H., R.N. <i>Care of Messrs. Chard</i> , 3, <i>Clifford's-inn</i> , <i>Fleet-street</i> , E.C.
1876		Somerville, Dr. Thomas, LL.D. <i>Hawthorn-hall</i> , <i>Wilmslow</i> , <i>Cheshire</i> .
1878		Soulsby, William Jameson, Esq. <i>Mansion-house</i> , E.C.
1860	p.	Southesk, James Carnegie, Earl of, K.T. <i>Kinnaird-castle</i> , <i>Brechin</i> , N.B.
1860		Southey,* James Lowther, Esq. <i>Admiralty Transport-office</i> , <i>Drury-buildings</i> , <i>Liverpool</i> .
1872	p.	Spalding, Major H. (104th Regiment).
1865		Spalding, Samuel, Esq. <i>South Darent</i> , <i>Kent</i> .
1874		Sparrow, William, Esq. <i>Albrighton-hall</i> , <i>Shrewsbury</i> .
1873		Spence, Jno. Berger, Esq., F.G.S., &c. <i>Erlington-house</i> , <i>Whalley-range</i> , <i>Manchester</i> .
1870		Spencer, Admiral the Hon. J. W. S. 5, <i>Portman-street</i> , W.
1874		Spencer, Walter, Esq. <i>Grove-end-lodge</i> , <i>Highgate-road</i> , N.W.
1878		Spice, Robert Paulson, Esq. 21, <i>Parliament-street</i> , S.W.
1867		Spicer, Edward, Esq. 19, <i>New Bridge-street</i> , E.C.
1874		Spicer, Jas., Esq. <i>The Harts</i> , <i>Woodford</i> , <i>Essex</i> .
1874		Spicer, Capt. Richard W. 3, <i>Chesham-place</i> , <i>Belgrave-square</i> , S.W.
1863		Spickernell, Dr. Geo. E., Principal of Eastman's Royal Naval Establishment, <i>Eastern-parade</i> , <i>Southsea</i> .
1855	C. p.	Spottiswoode,* William, Esq., F.R.S. 41, <i>Grosvenor-place</i> , S.W.
1859	p.	Spratt,* Rear-Admiral Thos. A. B., C.B., F.R.S. <i>Clare-lodge</i> , <i>Nevill-park</i> , <i>Tunbridge Wells</i> , <i>Kent</i> .
1866	p.	Spruce, Richard, Esq., PH.D. <i>Coneythorpe</i> , <i>Malton</i> , <i>Yorkshire</i> .
1879		Spuhler, Lieut. Francois Alphonse. <i>Care of R. Martineau, Esq.</i> , 37, <i>Regent's-park-road</i> , N.W.
1871		Square, William, Esq., F.R.C.S. 22, <i>Portland-square</i> , <i>Plymouth</i> .
1879		Stafford, Cromartie Leveson-Gower, Marquis of. <i>Stafford-house</i> , <i>St. James's</i> , S.W.; and <i>Dunrobin-castle</i> , <i>Golspie</i> , <i>Sutherlandshire</i> .
1853		Stanford, Edward, Esq. 55, <i>Charing-cross</i> , S.W.
1877		Stanford,* Edward, Esq., jun. 17, <i>Spring-gardens</i> , S.W.
1860		Stanhope,* Walter Spencer, Esq. <i>Cannon-hall</i> , <i>Barnsley</i> , <i>Yorkshire</i> .
1870		Stanley, Staff-Commander Henry J., R.N. <i>Admiralty Survey</i> , <i>Melbourne</i> ; and <i>Hydrographic-office</i> , <i>Admiralty</i> , S.W.
1872		Stanley,* Walmsley, Esq., C.E. <i>Albert-house</i> , <i>West End</i> , <i>Esher</i> , <i>Surrey</i> .
1869		Stanton, Charles Holbrow, Esq. 65, <i>Redcliffe-gardens</i> , S.W.
1875		Stanton,* Edw. Wm., Esq., M.A. 5, <i>Verulam-buildings</i> , <i>Gray's-inn</i> , W.C.
1863		Stanton, George, Esq. <i>Coton-hill</i> , <i>Shrewsbury</i> ; and <i>Conservative Club</i> , S.W.
1871		Stark, Wm. Emery, Esq. <i>Rydal-lodge</i> , <i>New-park-road</i> , <i>Brixton-hill</i> .
1870		Starling, Joseph, Esq. <i>Beresford-lodge</i> , <i>Dyke-road</i> , <i>Brighton</i> .
1868		Staveley, Major-Gen. Sir Charles, K.C.B. <i>United Service Club</i> , S.W.
1863		Staveley,* Miles, Esq. <i>Old Steningford-hall</i> , <i>Ripon</i> .



Year of Election.	
1869	Stebbing, Edward Charles, Esq. <i>National Debt Office, 19, Old Jewry, E.C.; and The Aspens, Sunbury.</i>
1879	Steel, Major-General James A. 73, <i>Cambridge-terrace, Hyde-park, W.</i>
1867	Steel, Major J. P., R.E. <i>Simla. Care of the Oriental Bank, 40, Threadneedle-street, E.C.</i>
1868	Steel, William Strang, Esq. 65, <i>Lancaster-gate, Hyde-park, W.</i>
1876	Steele, James Dickson, Esq. <i>H.M. Female Convict Prison, Woking, Surrey.</i>
1871	Stein, Hon. Robert. <i>Port Louis, Mauritius. Care of Messrs. Stein, and Co. 22, Basinghall-street, E.C.</i>
1870	Stenning, Charles, Esq. 3, <i>Upper Hamilton-terrace, N.W.</i>
1830	Stephen,* Sir George. <i>Melbourne. Care of Mr. H. W. Ravenscroft, 15, John-street, Bedford-row, W.C.</i>
1874	Stephens, Harold, Esq. <i>Finchley, N.W.</i>
1870	Stephens,* Thomas Wall, Esq. 112, <i>Queen's-gate, South Kensington, S.W.</i>
1876	Stephenson, Jno. Hunter, Esq. 3, <i>Newman's-court, Cornhill, E.C.</i>
1857	Stephenson, Sir R. Macdonald, C.E. 72, <i>Lancaster-gate, W.; and East-cottage, Worthing.</i>
1866	Stepney, A. K. Cowell, Esq. 6, <i>St. George's-place, Knightsbridge, S.W.</i>
1877	Sterndale, Robert A., Esq.
1869	Steuart, Colonel T. R. (Bombay Army). 31, <i>Linden-gardens, Notting-hill, W.</i>
1874	Stevens, George Richard, Esq. <i>Kurruljeen, Hong Kong.</i>
1855	Stevens, Henry, Esq., F.S.A. 4, <i>Trafalgar-square, W.C.</i>
1876	Stevenson, Capt. Geo. St. Claire. <i>Waterden-road, Guildford.</i>
1877	Stevenson,* James, Esq. <i>Broomfield, Largs, N. B.</i>
1874	Steward, Major Edward H., R.E. <i>War-office, Whitehall, S.W.</i>
1869	Stewart, Major C. E. (Bengal Staff Corps). 51, <i>Redcliffe-square, S.W.</i>
1874	Stewart, Gilbert McLeod, Esq. <i>Palace-chambers, St. Stephen's, S.W.</i>
1876	Stewart, H., Esq. 39, <i>Bruton-street, W.</i>
1871	Stewart,* Captain Herbert (3rd Dragoon Guards).
1866	Stewart, Rev. Dr. James. <i>Loxdale, Alice, South Africa. Care of Robert Young, Esq., Offices of the Free Church of Scotland, Edinburgh.</i>
1860	Stewart,* Major J. H. M. Shaw (Royal Madras Engineers).
1874	Stewart, Robert, Esq. <i>Port Elizabeth, Cape of Good Hope. Care of the Standard Bank, 10, Clement's-lane, Lombard-street, E.C.</i>
1877	Stewart,* Robert, Esq.
1873	Stewart, Admiral Sir Wm. Houston, K.C.B. 50, <i>Warwick-square, S.W., and Admiralty, S.W.</i>
1870	Stilwell, Henry, Esq., M.D. <i>Moarcroft, Hillington, Uxbridge.</i>
1879	Stilwell, James, Esq. <i>Victoria-park, Dover.</i>
1875	Stirling, Arthur F. G., Esq. <i>Oxford and Cambridge Club, S.W.</i>
1875	Stirling,* J. Carolus, Esq. 79½, <i>Gracechurch-street, E.C.</i>
1863	Stirling, Sir Walter, Bart. 36, <i>Portman-square, W.</i>
1878	Stock, Collard Joseph, Esq. 21, <i>Grove-road, Highgate-road, N.W.</i>
1860	Stocker, John Palmer, Esq. 93, <i>Oxford-terrace, Hyde-park, W.</i>

Year of Election.		
1845	C. P.	Stokes,* Vice-Admiral John Lort. <i>United Service Club, S. W.; and Scotchcell, Haverfordwest, Wales.</i>
1868		Stone, David H., Esq., Alderman. <i>7, Bucklersbury, E.C.</i>
1874	P.	Stone, Octavius C., Esq. <i>Springfield, Nuneaton.</i>
1867		Story,* Edwin, Esq., M.A. <i>88, Oldfield-road, Stoke Newington, N.</i>
1877		Stott,* Rev. Samuel Walter, B.A. <i>York.</i>
1868		Stovin, Rev. Charles F. <i>59, Warwick-square, S. W.</i>
1873		Stow, Geo. W., Esq. <i>Queen's Town, S. Africa.</i>
1866	C. P.	Strachey, Major-General Richard, R.E., C.S.I., F.R.S. <i>Stovey-house, Clapham-common, S. W.; and India-office, S. W.</i>
1858		Stratford de Redcliffe, Right Hon. Stratford Canning, Viscount, K.G., G.C.B. <i>Frant-court, Tunbridge Wells.</i>
1864		Straton, Rev. N. D. J. <i>The Vicarage, Wakefield.</i>
1879		Street,* Edmund, Esq. <i>Millfield-lane, Highgate, N.</i>
1875		Streeter, Alfred, Esq. <i>Fir-cilla, Chestnut-grove, New Malden, Surrey.</i>
1877		Streeter,* Edwin William, Esq. <i>The Mount, Primrose-hill-road, N. W.; and Callis-court, St. Peter's, Kent.</i>
1860		Strickland, Edward, Esq., C.B., Commissary-General. <i>Care of Sir Chas. R. McGrigor, Bart., and Co., 25, Charles-street, St. James's-square, S. W.</i>
1868		Strode,* Alf. Rowland Chetham, Esq. <i>Dunedin, Otago, New Zealand.</i>
1875		Strong, Alfred, Esq. <i>7, Burlington-road, St. Stephen's-square, Baywater, W.</i>
1853		Strousberg, Dr. Bethel Henry.
1874		Strousberg, Hy., Esq., jun.
1853		Strutt, George H., Esq., F.R.A.S. <i>Bridge-hill, Belper.</i>
1876		Stuart, Alexander, Esq. <i>43, Queensborough-terrace, Porchester-gate, W.</i>
1873		Stuart, Lieut.-Gen. Charles. <i>11, Eleaston-place, Queen's-gate, S. W.</i>
1859		Stuart, Lieut.-Col. J. F. D. Crichton. <i>25, Wilton-crescent, Belgrave-square, S. W.</i>
1875		Stuart,* James Melias, Esq. <i>Oakenshaw, Upper Norwood.</i>
1866	P.	Stuart, Major Robert. <i>Kidwell's-park, Maidenhead; and Athenaeum Club, Pall-mall, S. W.</i>
1876		Stuart,* Colonel S. William. <i>36, Hill-street, W.</i>
1873		Sturgeon, Wentworth, Esq. <i>Cocoa Tree Club, St. James's-street, S. W.</i>
1876		Sturman, Rev. M. C. T. <i>54, Talfourd-road, Camberwell, S.E.</i>
1872		Sturt, Henry, Esq., jun. <i>119, Holland-road, Kensington, W.</i>
1872		Styan, Arthur, Esq., F.S.A. <i>28, Norfolk-crescent, Hyde-park, W.</i>
1878		Suche, Dr. George, F.L.S. <i>101, Ledbury-road, Westbourne-park, W.</i>
1864		Sudeley, Lord. <i>Toddington-park, Winchcombe, Gloucestershire.</i>
1857		Sullivan, Rear-Admiral Sir Bartholomew J., R.N., K.C.B. <i>Bournemouth.</i>
1873		Sullivan, Sir Edw., Bart. <i>13, Grosvenor-place, S. W.</i>
1865		Sullivan, Captain T. W., R.N., C.B., C.M.G.
1869		Summerhayes,* William, Esq., M.D. <i>Crown-point, Ealing.</i>
1862		Surridge, Rev. Henry Arthur Dillon, M.A. <i>Boudon, Altrincham.</i>
1862		Surtees, Colonel Charles Freville. <i>Chalcott-house, Long Ditton, Surrey.</i>



## List of Fellows of the

Year of Election.	
1873	Sutherland, Geo., Esq. <i>Arboretum-square, Derby.</i>
1861	Sutherland,* George Granville William, Duke of, K.G., F.R.S. <i>Stafford-house, St. James's-palace, S.W.</i>
1869	Sutherland, Robert, Esq. <i>Egham-rise, Surrey.</i>
1869	Sutherland, Thomas, Esq. 60, <i>Bedford-gardens, Campden-hill, Kensington, W.</i>
1874	Sutton, John Manners, Esq. <i>Kilham-hall, Newark, Notts.</i>
1873	Suzuki, Kinzo (Sec. of Japanese Legation). 9, <i>Kensington-park-gardens, W.</i>
1875	Swain, Edward, Esq. <i>Three Counties Asylum, Stotfold, Baldock.</i>
1876	Swaine, Capt. Leopold Victor. 14, <i>Queen's-gate, S.W.</i>
1875	Swann, Rev. P. F., M.A. <i>Brandsby, Easingwold, Yorkshire.</i>
1837	Swanzy, Andrew, Esq. <i>Sevenoaks, Kent.</i>
1875	Swart, Hon. N. J. R. <i>Care of J. J. Pratt, Esq., 79, Queen-street, Cheapside, E.C.</i>
1862	Swinburne,* Commr. Sir John, Bart., R.N. <i>Capheaton, Newcastle-on-Tyne.</i>
1871	Syme, Henry, Esq. 60, <i>Palace-gardens-terrace, Campden-hill, W.</i>
1864	Symonds, F., Esq., M.D. <i>Beaumont-street, Oxford.</i>
1852	P. Synge,* Colonel Millington H., R.E. <i>United Service Club, Pall-mall, S.W.</i>
1875	Szilumper, Jas. Weeks, Esq., C.E., F.G.S. <i>Aberystwyth.</i>
1852	Tagart, Courtenay, Esq. <i>Reform Club, Pall-mall, S.W.</i>
1859	Tagart, Francis, Esq. 199, <i>Queen's-gate, S.W.; and Old Sneed-park, near Bristol.</i>
1857	Tait,* Robert, Esq. 14, <i>Queen Anne-street, W.</i>
1861	Talbot de Malahide, James Talbot, Lord, F.R.S. 15, <i>Chesterfield-street, May-fair, W.; Athenaeum Club; and Malahide Castle, Co. Dublin.</i>
1877	Taubman, George Goldie, Esq. <i>Naval and Military Club, Piccadilly, W.</i>
1861	Taylor, Commander A. Dundas, L.N. (Director of Marine Surveys), <i>Calcutta. Care of Messrs. H. S. King and Co., 65, Cornhill, E.C.</i>
1873	Taylor, Charles, Esq. <i>Church-house-school, Ealing, W.</i>
1875	Taylor, C. A., Esq. <i>Downham Market, Norfolk.</i>
1878	Taylor, Rev. Charles Parbutt. <i>Severnside, Maisemore, Gloucester.</i>
1876	Taylor, Fras. Clement, Esq. <i>Summerleaze, East Harptree, near Bristol.</i>
1869	Taylor, George N., Esq. <i>The Mount, Sunning-hill, Staines.</i>
1865	Taylor, H. L., Esq. <i>Reform Club, S.W.; and 23, Phillimore-gardens, Kensington, W.</i>
1873	Taylor, J. Banks, Esq. 25, <i>Austin Friars, E.C.</i>
1878	Taylor, Rev. Jas. Hudson. 6, <i>Pyrland-road, Newington-green, N.</i>
1871	Taylor,* John, Esq. <i>The Rocks, Bath; and Booth-hall, Blackley, Lancashire.</i>
1863	Taylor, John, Esq. 110, <i>Fenchurch-street, E.C.</i>
1870	Taylor,* John Fenton, Esq. 20, <i>New-street, Spring-gardens, S.W.</i>
1854	Taylor,* John Stopford, Esq., M.D. 2, <i>Millbank-terrace, Anfield-road, Liverpool.</i>

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Election.

- 1863 Taylor, Lieut.-Gen. R. C. H., C.B. 16, *Eaton-place, S.W.*; and *Carlton Club, S. W.*
- 1878 T aylor, Thomas, Esq. 1, *Hyde-park-gardens, W.*; and *Aston Rowant, Oxfordshire.*
- 1864 Taylor, William Richard, Esq., Deputy-Commissary.
- 1875 Telfer, Commr. Buchan, R.N., F.S.A. 14, *Sumner-place, Onslow-square, S. W.*
- 1876 Temple, Lieut. Geo., R.N. *The Nash, near Worcester.*
- 1865 p. Temple, Sir Richard, K.C.S.I.
- 1857 Temple-West, Col. T.
- 1860 Templeton, John, Esq. 24, *Budge-row, E. C.*
- 1857 p. Tennant, Professor James. 149, *Strand, W. C.*
- 1873 Terashima, Munenori. 9, *Kensington-park-gardens, W.*
- 1872 Terrero, Maximo, Esq. 88, *Belsize-park-gardens, N. W.*
- 1830 Thatcher,\* Colonel.
- 1874 Thomas, Chas. Evan, Esq. 98, *Queen's-gate, S. W.*
- 1863 Thomas, G., Esq.
- 1872 Thomas, James Lewis, Esq., F.S.A. *War-office, Horse-Guards*; 26, *Gloucester-street, Warwick-square, S. W.*; and *Thatched-House Club, St. James's-street, S. W.*
- 1865 Thomas, John Henwood, Esq. *East India Dept., Custom-house, E. C.*
- 1864 Thomas, J. R., Esq., Staff Assist. Surg. *Castle-hill, Fishguard, Pembrokeshire.*
- 1874 Thomas, R. Gerard de V., Esq., M.A. *Eythorne-house, Maidstone.*
- 1875 Thomas, Wesley Hy., Esq. *Care of W. Savage, Esq., Woodford-lodge, Woodford.*
- 1878 Thomasson, E. S. Esq. "*Globe*" *Steel-works, Sheffield.*
- 1876 Thompson, Major H. (Bengal Staff Corps). *Care of Messrs. Grindlay and Co., 55, Parliament-street, S. W.*
- 1869 Thompson,\* Henry Yates, Esq. *The Windham Club, S. W.*
- 1874 Thompson, Thomas, Esq. (H.M. Vice-Consul, *Delagoa Bay*).
- 1863 Thomson, James, Esq. *Housill, Hawkhurst, Kent.*
- 1863 Thomson, James Duncan, Esq. (Portuguese Consul). *St. Peter's-chambers, Cornhill, E. C.*
- 1866 p. Thomson, John, Esq. 12, *Elgin-gardens, Effra-road, Brixton, S. W.*
- 1848 p. Thomson,\* J. Turnbull, Esq. (Surveyor-General of New Zealand). *Wellington, New Zealand. Care of A. C. Thomson, Esq., Post Office Savings Bank, E. C.*
- 1861 p. Thomson,\* Ronald Ferguson, Esq.
- 1865 p. Thomson, W. T., Esq.
- 1862 Thorne,\* Augustus, Esq. *Belgrave-mansions, Grosvenor-gardens, S. W.*
- 1876 Thornhill, Capt. Jas. Alfred. *Bradbourne-villas, Bushey-hill, Camberwell.*
- 1867 Thornton, Edward, Esq., C.B. *Bank-house, Windsor.*
- 1847 Thornton, Rev. Thomas Cooke, M.A., M.R.I.A. *Brock-hall, near Weolton, Northamptonshire.*
- 1868 Thorold, Alexander W. T. Grant, Esq. 3, *Grosvenor-gardens, S. W.*
- 1877 Thorpe, Geo., Esq. 20, *Eastcheap, E. C.*



Year of  
Election.

- 1871 Thorpe, Wm. Geo., Esq., F.G.S. *Gloucester-house, Larkhall-rise, S.W.; and Barton's-house, Ipplepen, Newton Abbot, Devon.*
- 1877 Thring, Sir Henry, K.C.B. 2, *New-street, Spring-gardens, S.W.*
- 1859 Thuillier, Lieut.-Gen. Sir H. L., C.S.I., F.R.S. *South Bank-lodge, Stratford-road, Kensington, W.*
- 1872 Thuillier, Capt. Henry R., R.E. *Care of Messrs. King and Co., Pall-mall, S.W.*
- 1865 Thurburn,\* C. A., Esq. 16, *Kensington-park-gardens, Notting-hill, W.*
- 1861 Thurlow, The Right Hon. Lord. *Dunphail, Forres, N. B.*
- 1874 Thwaites, Capt. Joseph. 5, *Washington-terrace, Southampton.*
- 1877 Tietkins, W. H., Esq. (Government Surveyor, *South Australia*).
- 1879 Tillbrook, Rev. W. John. *Comberton, near Cambridge.*
- 1874 Tighe, Col. Fred. 48, *Albemarle-street, W.; and Travellers' Club, S.W.*
- 1878 Timmins, Samuel, Esq., J.P., F.S.A., &c. *Eleetham-lodge, Birmingham.*
- 1872 Tialine, George, Esq. 17, *Prince's-square, Bayswater, W.*
- 1874 Tinné,\* J. Ernest, Esq. *Briarley, Aigburth, near Liverpool.*
- 1839 Tinné,\* John A., Esq. *Briarley, Aigburth, near Liverpool.*
- 1873 Tipping, George B., Esq. *Coombe-lodge, Kingston-hill, Surrey.*
- 1876 Tizard, Staff-Commander T. H., R.N. *Hydrographic-office, Admiralty S.W.*
- 1877 Todd, Arthur, Esq. 125, *Triton Ville-road, Sandymount, Dublin.*
- 1862 Todd, John, Esq. *Aukland-lodge, Blackheath, S.E.*
- 1865 Todd, Rev. John W., D.D. *Tudor-hall, Forest-hill, Sydenham, S.E.*
- 1877 Tomlin, John Hewitt, Esq. *Wesley-terrace, Bramley, Leeds.*
- 1853 Tomline, George, Esq. 1, *Carlton-house-terrace, S.W.*
- 1873 Tomlinson, John, Esq. *Malpas, Cheshire.*
- 1875 Tomlinson, Walter, Esq., B.A. 3, *Richmond-terrace, Whitehall, S.W.*
- 1877 Tomlinson,\* W. E. M., Esq., M.A. 3, *Richmond-terrace, Whitehall, S.W.; and Athenæum Club, S.W.*
- 1856 Torrance, John, Esq.
- 1866 Torrens, Sir Robert Richard, K.C.M.G. 12, *Chester-place, W.; and The Cott Holm, near Ashburton, South Devon.*
- 1877 Torry,\* Lieut. Harold J. B. *Hanover-square Club, W.*
- 1875 Townshend, Capt. F. French (2nd Life Guards). *Arthur's Club, St. James's-street, S.W.*
- 1859 Townshend, Capt. John, R.N. 2, *Fernside-villas, New Wandsworth.*
- 1846 Towry,\* George Edward, Esq.
- 1873 Towse, John Wrench, Esq. *Fishmongers'-hall, London-bridge, E.C.*
- 1858 Towson, J. Thomas, Esq. 47, *Upper Parliament-street, Liverpool.*
- 1864 p. Toynbee,\* Capt. Henry. 12, *Upper Westbourne-terrace, W.*
- 1863 Tozer,\* Rev. H. F., M.A. *Exeter College, Oxford.*
- 1863 Travers,\* Arch., Esq. 28A, *Addison-road, Kensington, W.*
- 1876 Travers, Lieut.-Gen. James, V.C. *Care of Messrs. King and Co., 65, Cornhill E.C.*

Year of  
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- 1859 Tremlett, Rev. Francis W., M.A., D.C.L., PH.D. *Belsize-park, Hampstead, N.W.*
- 1879 Tremlett, Rear-Admiral Francisco S. *Belle Vue, Tunbridge Wells.*
- 1865 Trench,\* Major the Hon. Le Poer, R.E. 3, *Hyde-park-gardens, W.; and Ordnance Survey-office, Pinlicko, S.W.*
- 1863 Trestrail, Rev. Frederick. *St. John's-road, Newport, Isle of Wight.*
- 1872 Treuenfeld, Richard von F., Esq. 12, *Queen Anne's-gate, Westminster, S.W.*
- 1862 Trevelyan, Sir Charles Edward, Bart. K.C.B. 8, *Grosvenor-crescent, S.W.*
- 1864 Trimmer, Edmund, Esq. 41, *Botolph-lane, E.C.*
- 1875 Trinder, Hy. Wm., Esq. 135, *Harley-street, W.*
- 1867 Tritton, Joseph Herbert, Esq. 54, *Lombard-street, E.C.*
- 1871 Trivett, Captain John Fredk., R.N.R. *The Homestead, Hackney-common, N.E.*
- 1878 Trollope, Anthony, Esq. 39, *Montague-square, W.C.*
- 1876 Trotter,\* Coutts, Esq. *Athenæum Club, Pall-mall, S.W.*
- 1869 G. Trotter, Major Henry, R.E. 11, *Hertford-street, Mayfair, W.*
- 1872 Trotter, Captain J. Moubray. *Care of Messrs. Haldanes and Brookman, 17, Charlotte-street, Edinburgh.*
- 1874 Trotter,\* William, Esq. 11, *Hertford-street, Mayfair, W.*
- 1870 Trutch, J. W., Esq., C.M.G. *British Columbia.*
- 1867 Tryon, Captain George, R.N., C.B. 5, *Eaton-place, S.W.; and Army and Navy Club, S.W.*
- 1862 p. Tuckett, Francis Fox, Esq. *Frenchay, near Bristol.*
- 1865 Tuckett, Philip D., Esq. *Southwood-lawn, Highgate, N.*
- 1852 Tudor, Edward Owen, Esq., F.R.A. 1, *Portugal-street, Grosvenor-square, W.*
- 1857 Tudor, Henry, Esq. 12, *Portland-place, W.*
- 1876 Tufnell, Wm., Esq. 6, *Eaton-square, S.W.; and Hatfield-place, Hatfield Peveral.*
- 1864 Turnbull, George, Esq., C.E., F.R.A.S. *Rosehill, Abbots Langley, Herts.*
- 1878 Turnbull,\* Walter, Esq. *Mount Henley, Sydenham-hill, S.E.*
- 1870 Turner, Lieut.-General Henry Blois (Bomb. Eng.). 131, *Harley-street, W.*
- 1874 Turner, H. G., Esq. (Madras Civil Service). 14, *St. James's-square, S.W.*
- 1874 Turner, Jos. Edward, Esq. 30, *King-street, Cheapside, E.C.*
- 1863 Turner, Thomas, Esq. 36, *Harley-street, W.*
- 1878 Turton, Lieut. W. H., R.E. *South-camp, Aldershot.*
- 1867 Tweedie, Major Michael, R.A. 101, *Belgrave-road, S.W.; and Army and Navy Club, S.W.*
- 1864 Twentyman,\* A. C., Esq. *Castlecroft, near Wolverhampton.*
- 1863 Twentyman, William H., Esq. *Ravenscorth, St. John's-wood-park, N.W.*
- 1849 Twiss, Sir Travers, D.C.L., F.R.S. 3, *Paper-buildings, Temple, E.C.*
- 1874 Twite, Charles, Esq. *Castle-house, St. Agnes, Scorrier, Cornwall.*
- 1858 p. Twyford, Captain A. W., 21st Hussars. *Governor, York Castle.*
- 1865 Tyer, Edward, Esq., C.E., F.R.A.S. 32, *Russell-square, W.C.*



Year of Election.		
1862		Tyler,* George, Esq. 24, <i>Holloway-place, Holloway-road, N.</i>
1873		Tyler, W. James, Esq. 106, <i>Cannon-street, E.C.</i>
1859		Tytler, Colonel W. Fraser. <i>Aldourie, Inverness.</i>
1876		Ulliyett, Henry, Esq. <i>Dover-road, Folkestone.</i>
1862		Underhill, Edward Bean, Esq., LL.D. <i>Derwent-lodge, Thurlow-road, Hampstead, N.W.</i>
1868		Unwin, Howard, Esq., C.E. <i>Oxford-court, 109A, Cannon-street, E.C.</i>
1877		Vacher,* E. P., Esq. <i>Oak-hill, Surbiton.</i>
1844		Vacher,* George, Esq. <i>Oak-hill, Surbiton.</i>
1872		Vallentin,* James R., Esq. 55, <i>Cow-cross, E.C.</i>
1874		Valentine, William J., Esq.
1878		Van Campen, Samuel Richard, Esq. 2, <i>Vernon-place, Bloomsbury-square, W.C.</i>
1862		Vander Byl,* P. G., Esq.
1876		Vanrenen, Lieut.-Col. Adrian Deney (Bengal Staff Corps). 24, <i>Lansdowne-road, Notting-hill, W.</i>
1875		Vans-Agnew, Robert, Esq., M.P. <i>Carlton Club, S.W.; and Barnbarrock, Wigtownshire, N. B.</i>
1879		Vaughan, Right Rev. Herbert (Bishop of Salford). <i>Bishop's-house, Salford.</i>
1856		Vaughan,* James, Esq., F.R.C.S. <i>Builth, Breconshire.</i>
1852		Vavasour,* Sir Henry M., Bart. 8, <i>Upper Grosvenor-street, W.</i>
1855		Vavasour, James, Esq. <i>Knockholt, near Sevenoaks, Kent.</i>
1871		Vereker, Lieut.-Col. the Hon. Charles Smyth. <i>Junior United Service Club, S.W.</i>
1863	p.	Vereker,* The Hon. H. P. LL.D. (H.M. Consul at Charante). 1, <i>Portman-square, W.</i>
1862		Verner, Edward Wingfield, Esq., M.P. <i>The Aske, Bray, Ireland.</i>
1862		Verney,* Commr. Edmond H., R.N. <i>Rhianva, Bangor, North Wales.</i>
1837	C.	Verney,* Sir Harry C., Bart. F.R.A.S. <i>Travellers' Club, S.W.; and Claydon-house, Bucks.</i>
1852		Verulam, Right Hon. James Walter, Earl of. <i>Gorhambury, near St. Albans; Barry-hill, Surrey; and Messing-hall, Essex.</i>
1874		Vincent,* Capt. Chas (late I.N.). 31, <i>Cornwall-road, Westbourne-park, W.</i>
1837		Vincent, John, Esq. 2, <i>Ulster-terrace, Regent's-park, N.W.</i>
1865		Vincent,* M. C., Esq., Professor of Economic Geology and Metallurgy; Inspector of Mines, &c. <i>Cincinnati, U. S.; and 127, Strand, W.C.</i>

Year of Election.	
1871	Vine, Staff-Comm. Wm. W., R.N. <i>Care of Messrs. Hallett and Co., St. Martin's place, W.</i>
1858	Vipes, William Reynolds, Esq., F.R.A.S. <i>Care of Sydney H. Vines, Esq., Christ's College, Cambridge.</i>
1874	Viney, Rev. Josiah. <i>Fernwood, Highgate, N.</i>
1872	Vivian, Hon. H. Crespigny, C.B. <i>Foreign-office, S.W.</i>
1863	Vivian, Major Quintus. 17, <i>Chesham-street, Belgrave-square, S.W.</i>
1876	Vivian, Capt. Ralph. 24, <i>Grosvenor-street, W.</i>
1876	Vyse, Griffin William, Esq. <i>Tremough, Penryn, Cornwall.</i>
1863	Vyvyan,* Sir Richard Rawlinson, Bart., F.R.S. <i>Trelowarren, Cornwall.</i>
1863	Wade, R. B., Esq. 13, <i>Seymour-street, Portman-square, W.</i>
1863	Wade, Sir Thos. F., K.C.B., H.B.M. Minister Plenipotentiary, Envoy Extraordinary, and Superintendent of Trade. <i>Peking, China. Care of R. B. Wade, Esq., 13, Seymour-street, Portman-square, W.</i>
1877	Wadham,* Edward, Esq., J.P. <i>Milwood Dalton, Lancashire.</i>
1873	Wagner,* Henry, Esq., M.A. 13, <i>Half-Moon-street, Piccadilly, W.</i>
1853	Wagstaff,* William Racster, Baron, M.D., M.A.
1876	Wainwright, Chas. Jas., Esq. <i>Elmhurst, East End, Finchley, N.; and 251, High Holborn, W.C.</i>
1867	Waite,* Rev. John.
1871	Wakley, Thos. Finsbury Septimus, Esq., C.E. <i>College-terrace, Guernsey.</i>
1874	Walburn, Edmund, Esq., M.A., Principal of Grosvenor College. 366, <i>Brixton-road, S.W.</i>
1873	Walford,* Lionel N., Esq. 66, <i>Lowndes-square, S.W.</i>
1874	Walkem, Hon. Geo. Anthony. <i>British Columbia.</i>
1870	p. Walker,* Albert, Esq. <i>Auckland Club, New Zealand.</i>
1875	Walker, Capt. Arthur Campbell (Royal Body Guard). <i>Army and Navy Club, Pall-mall, S.W.</i>
1862	Walker, Major-General C. P. Beauchamp, C.B. 97, <i>Onslow-square, S.W.; and United Service Club, S.W.</i>
1861	Walker, Edward Henry, Esq. (H.M. Consul at Cagliari). <i>Care of Messrs. Drummond, Charing-cross.</i>
1863	Walker,* Frederick John, Esq. <i>The Priory, Bathwick, Bath.</i>
1872	Walker, Capt. J. Campbell (Madras Staff Corps). <i>Care of Messrs. Grindlay and Co., 55, Parliament-street, S.W.</i>
1859	Walker,* Colonel James T., F.R.S., Royal Engineers (Supt. Gt. Trig. Survey of India). <i>Dehra Doon, India. Care of Messrs. H. S. King and Co., 65, Cornhill, E.C.</i>
1873	Walker, John, Esq. 351, <i>Brixton-road, S.W.</i>
1861	Walker,* John, Esq.



Year of Election.		
1858		Walker,* Captain John (H.M.'s 66th Foot). <i>Broom-hill, Colchester.</i>
1871	p.	Walker,* Capt. J. B. <i>Care of Messrs. Elder, Dempster, and Co., 48, Castle-street, Liverpool; and Old Calabar, near Bonny, West Africa.</i>
1864	p.	Walker, R. B. N., Esq. <i>Care of Mr. Blissett, 38, South Castle-street, Liverpool.</i>
1874		Walker, Robert, Esq. <i>39, Lombard-street, E.C.</i>
1861		Walker, Rev. William. <i>School-house, Reading.</i>
1866		Walker, William, Esq., F.S.A. <i>48, Hilldrop-road, Tufnell-park, N.</i>
1874		Walker, W. Fredk., Esq. <i>Moore-park-villas, Waltham-green, S.W.</i>
1868		Walkinshaw, William, Esq. <i>Hartley-grange, Winchfield, Hants.</i>
1854	p.	Wallace,* Alfred Russel, Esq. <i>Waldron-edge, Duppas-hill, Croydon.</i>
1861		Wallace, Rev. Charles Hill, M.A. <i>3, Harley-place, Clifton, Bristol.</i>
1864		Waller, Rev. Horace. <i>The Rectory, Twynell-by-Thrapston, Northamptonshire.</i>
1863	p.	Wallich, George C., Esq., M.D. <i>162, Holland-road, Kensington, W.</i>
1872		Wallroth,* Chas. Henry, Esq. <i>Woodclyffe, Chislehurst.</i>
1874		Walls, William, Esq. <i>2, Belhacen-terrace, Glasgow.</i>
1876		Walpole, Lieut. Robert Horace, R.N. <i>Rainthorpe, near Norwich; and 4, Dean-street, Park-lane, W.</i>
1863		Walpole, Rt. Hon. Spencer, M.P., F.R.S. <i>109, Eaton-square, S.W.</i>
1878		Walrond, Sir J. W., Bart. <i>54, Grosvenor-street, W.</i>
1879		Walter, Lieut. Fred. Edw., R.N.A. <i>Aldershot.</i>
1853		Walter, Henry Frazer, Esq. <i>Papplewick-hall, near Nottingham.</i>
1873		Waltham,* Edward, Esq. <i>Watcomb-house, St. Anne's-place, Streatham-hill, S.W.</i>
1863		Walton, J. W., Esq. <i>41, Great Marlborough-street, W.</i>
1864		Walton, R. G., Esq., C.E. <i>Bombay.</i>
1877		Ward, Charles, Esq. <i>Newcastle, Natal, South Africa. Care of Dr. H. Buss, Blenheim-lodge, Turnham-green, W.</i>
1876		Ward,* Christopher, Esq. <i>Saville-place, Halifax.</i>
1853		Ward,* George, Esq.
1874		Ward, John, Esq. <i>Lenox-vale, Belfast. Care of J. A. Rose, Esq., 11 Salisbury-street, Strand, W.C.</i>
1878		Ward, John Edward, Esq. <i>Elm-house, Grosvenor-road, S.W.</i>
1868	p.	Ward, Captain the Hon. Wm. John, R.N., A.D.C. <i>44, Charing-cross, S.W.</i>
1875		Warden, Edmund M., Esq. <i>Wyberlye, Burgess-hill, Sussex.</i>
1862		Wardlaw, John, Esq. <i>44, Prince's-gardens, Hyde-park, S.W.</i>
1876		Warner, Rev. Geo. Townsend. <i>Newton-college, S. Devon.</i>
1877		Warner,* J. H. B., Esq. <i>Quorn-hall, Loughborough; and Conservative Club, S.W.</i>
1876		Warrand, Colonel W. E., R.E. <i>Aldershot.</i>
1872		Warre, Rev. Edmond, M.A. <i>Eton College.</i>
1869		Warre, Lieut.-General H. J., C.B.
1874	p.	Warren, Lieut.-Col. Charles, R.E., C.M.G. <i>Midhurst.</i>

Year of Election.	
1869	Warren, Charles, Esq. 17, <i>Hanover-street, Peckham, S.E.</i>
1862	Warren, Major Richard Pelham. <i>Worting-house, Basingstoke.</i>
1876	Waterfield,* O. C., Esq. <i>Temple-grove, East Sheen.</i>
1867	Waterhouse, George Marsden, Esq. <i>Care of Messrs. Morrison and Co., 4, Fen-church-street, E.C.</i>
1874	Waterhouse,* Major Jas., Bengal Staff Corps (Assistant Surveyor-General of India). <i>Surveyor-General's-office, Calcutta. Care of Messrs. Trübner and Co., 59, Ludgate-hill, E.C.</i>
1875	Waters, J. H. Ernest, Esq.
1874	Waters, T. J., Esq.
1874	Watherstone, Rev. Jno. Dundas. <i>The Lecturer's House, Monmouth.</i>
1862	Watney, John, Esq. 4, <i>Ironmonger-lane, E.C.</i>
1875	Watson, Capt. Chas. Moore, R.E. 25, <i>Fitzwilliam-place, Dublin.</i>
1859	Watson, James, Esq. 24, <i>Endsleigh-street, W.C.</i>
1860	Watson, James, Esq. <i>Langley-house, Langley, Bucks.</i>
1874	Watson, Sir James. 9, <i>Woodside-terrace, Glasgow.</i>
1876	Watson, Jno. Gibson, Esq. 20, <i>Clanricarde-gardens, Hyde-park, W.</i>
1861	Watson, John Harrison, Esq. 28, <i>Queensborough-terrace, Kensington-gardens, W.</i>
1875	Watson, Lieut. Joseph, R.N.R. 22, <i>Bancroft-road, Mile-end-road, E.</i>
1872	Watson, Robert, Esq. <i>Falcott-house, North-hill, Highgate, N.</i>
1867	Watson, Robert Spence, Esq. <i>Moss Croft, Gateshead-on-Tyne.</i>
1870	Watson, Thos., Esq. (Portuguese Vice-Consul, Cape Town). <i>Care of J. R. Thomson and Co., St. Peter's-chambers, E.C.</i>
1876	Watson, Wm. Livingstone, Esq. <i>Oriental Club, Hanover-square, W.</i>
1871	Watt, Robert, Esq., C.E. <i>Ashley-avenue, Belfast.</i>
1878	Watts, Rev. Arthur. <i>Training-college, Durham.</i>
1872	Watts, H. Cecil, Esq. <i>Lindfield-house, Lindfield, Surrey.</i>
1872	Watts, John, Esq. <i>Norton-court, near Gloucester.</i>
1874	Waugh, Fras. Gledstanes, Esq., M.A. <i>Oxford and Cambridge Club, Pall-mall, S.W.</i>
1879	Wavell, Lieut-Col. A. H. 102, <i>Piccadilly, W.</i>
1867	Waveney, Lord, F.R.S., &c. 7, <i>Audley-square, W.; and Flinton-hall, Harleston.</i>
1872	Webb, Geo. P., Esq. <i>Junior Athenæum Club, Piccadilly, W.</i>
1877	Webb, Captain H. G., 36th Regt. <i>Norton-barracks, Worcester; and Army and Navy Club, S.W.</i>
1876	Webb, J. C., Esq., M.D. 14, <i>Lower Belgrave-street, S.W.</i>
1875	Webb, Locock, Esq., Q.C. 1, <i>Hanover-terrace, Notting-hill, W.</i>
1858	Webb,* Capt. Sydney. <i>Riversdale, Twickenham.</i>
1862	Webb,* William Frederick, Esq. <i>Newstead Abbey, Notts; and Army and Navy Club, Pall-mall, S.W.</i>
1865	Webster, Alphonsus, Esq. 44, <i>Mecklenburgh-square, W.C.</i>
1866	Webster, George, Esq.
1874	Webster, James Hume, Esq. 14, <i>Chapel-street, Park-lane, W.</i>
1879	Webster, Robert G., Esq. <i>Library-chambers, Garden-court, Temple, E.C.</i>



Year of Election.	
1874	Wedd, George, Esq. 51, <i>Queen's-gardens, Hyde-park, S.W.</i>
1875	Weedow, Joseph, Esq. <i>Darnhall Grammar-school, Winsford, Cheshire.</i>
1860	Weguelin, Thomas Matthias, Esq., M.P. 57½, <i>Old Broad-street, E.C.</i>
1872	Weise, Jno., Esq. 103, <i>St. George's-road, Pimlico, S.W.</i>
1874	Weiss, Foveaux, Esq. 33, <i>Chester-terrace, Regent's-park, N.W.</i>
1878	Weiss, Hubert Foveaux, Esq. 33, <i>Chester-terrace, Regent's-park, N.W.</i>
1878	Welby, Reginald Earle, Esq. 95, <i>Jermyn-street, S.W.</i>
1851	Weller, Edward, Esq. 34, <i>Red-lion-square, W.C.</i>
1873	Wellings, Henry, Esq.
1853	C. Wellington,* Arthur Richard, Duke of, Major-General, K.G., D.C.L. <i>Apsley-house, W.; and Strathfieldsaye, Hampshire.</i>
1870	Wells,* Arthur, Esq. <i>Nottingham.</i>
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CALIFORNIA . . . . . Academy of Sciences	*TORONTO . . . . . Department of Public Instruction for Upper Canada
CHICAGO . . . . . The New Library	— . . . . . Canadian Institute of
MEXICO . . . . . Sociedad de Geografía y Estadística	UNITED STATES . . . . . Engineer Office (Geog. Surveys, W. of the 100th Meridian)
NEW HAVEN . . . . . Yale College Library	WASHINGTON . . . . . Congress Library of
*— . . . . . American Journal of Science and Arts	— . . . . . Hydrographic Office
NEW YORK . . . . . Geographical Society (Cooper's Institute)	— . . . . . Smithsonian Institution
PHILADELPHIA, Academy of Natural Sciences	— . . . . . United States Naval Observatory
— . . . . . American Philosophical Society	— . . . . . United States Geological and Geographical Survey of the Territories
— . . . . . Franklin Institute	
— . . . . . The 'American Naturalist'	WORCESTER . . . . . Antiquarian Society
QUEBEC . . . . . Library of the Parliament of Canada	

# AUSTRALASIA.

ADELAIDE . . . . . Library of the Legislature	SYDNEY . . . . . University Library
— . . . . . South Australian Institute	TASMANIA . . . . . Royal Society
MELBOURNE . . . . . Public Library	— . . . . . Public Library
*— . . . . . Mining Department	*VICTORIA . . . . . Royal Society
NEW SOUTH WALES . . . . . The Royal Society	NEW ZEALAND . . . . . Library of the House of Representatives



# NAMES OF INDIVIDUALS

TO WHOM

## THE ROYAL PREMIUMS AND OTHER TESTIMONIALS HAVE BEEN AWARDED.

- 1832.—**Mr. Richard Lander**—Royal Medal—for the discovery of the course of the River Niger or Quorra, and its outlet in the Gulf of Benin.
- 1833.—**Mr. John Biscoe**—Royal Medal—for the discovery of the land now named "Enderby Land" and "Graham Land," in the Antarctic Ocean.
- 1834.—**Captain Sir John Ross, R.N.**—Royal Medal—for discovery in the Arctic Regions of America.
- 1835.—**Sir Alexander Burnes**—Royal Medal—for the navigation of the River Indus, and a journey by Balkh and Bokhara across Central Asia.
- 1836.—**Captain Sir George Back, R.N.**—Royal Medal—for the discovery of the Great Fish River, and its navigation to the sea on the Arctic Coast of America.
- 1837.—**Captain Robert FitzRoy, R.N.**—Royal Medal—for the survey of the Shores of Patagonia, Chile, and Peru.
- 1838.—**Colonel Chesney, R.A.**—Royal Medal—for the general conduct of the "Euphrates Expedition" in 1835-6, and for accessions to the geography of Syria, Mesopotamia, and the Delta of Susiana.
- 1839.—**Mr. Thomas Simpson**—Founder's Medal—for the discovery and tracing, in 1837 and 1838, of about 300 miles of the Arctic shores of America.
- Dr. Edward Rüppell**—Patron's Medal—for his travels and researches in Nubia, Kordofan, Arabia, and Abyssinia.
- 1840.—**Col. H. C. Rawlinson, E.I.C.**—Founder's Medal—for his travels and researches in Susiana and Persian Kurdistan, and for the light thrown by him on the comparative geography of Western Asia.
- Sir R. H. Schomburgk**—Patron's Medal—for his travels and researches during the years 1835-9 in the colony of British Guayana, and in the adjacent parts of South America.
- 1841.—**Lieut. Raper, R.N.**—Founder's Medal—for the publication of his work on 'Navigation and Nautical Astronomy.'
- Lieut. John Wood, I.N.**—Patron's Medal—for his survey of the Indus, and re-discovery of the source of the River Oxus.
- 1842.—**Captain Sir James Clark Ross, R.N.**—Founder's Medal—for his discoveries in the Antarctic Ocean.
- Rev. Dr. E. Robinson, of New York**—Patron's Medal—for his work entitled 'Biblical Researches in Palestine.'
- 1843.—**Mr. Edward John Eyre**—Founder's Medal—for his explorations in Australia.
- Lieut. J. F. A. Symonds, R.E.**—Patron's Medal—for his survey in Palestine, and levels across the country to the Dead Sea.

- 1844.—**Mr. W. J. Hamilton**—Founder's Medal—for his researches in Asia Minor.  
**Prof. Adolph Erman**—Patron's Medal—for his extensive geographical labours.
- 1845.—**Dr. Beke**—Founder's Medal—for his extensive explorations in Abyssinia.  
**M. Charles Ritter**—Patron's Medal—for his important geographical works.
- 1846.—**Count P. E. de Strzelecki**—Founder's Medal—for his explorations and discoveries in the South-Eastern portion of Australia, and in Van Diemen's Land.  
**Prof. A. Th. Middendorff**—Patron's Medal—for his extensive explorations and discoveries in Northern and Eastern Siberia.
- 1847.—**Capt. Charles Sturt**—Founder's Medal—for his various and extensive explorations in Australia.  
**Dr. Ludwig Leichhardt**—Patron's Medal—for a journey performed from Moreton Bay to Port Essington.
- 1848.—**Sir James Brooke**, Rajah of Sarawak and Governor of Labuan—Founder's Medal—for his expedition to Borneo.  
**Captain Charles Wilkes**, U.S.N.—Patron's Medal—for his Voyage of Discovery in the S. Hemisphere and in the Antarctic Regions, in the years 1838-42.
- 1849.—**Austen H. Layard**, Esq., D.C.L., M.P.—Founder's Medal—for his contributions to Asiatic geography, researches in Mesopotamia, and discoveries of the remains of Nineveh.  
**Baron Ch. Hügel**—Patron's Medal—for his explorations of Cashmere and surrounding countries, communicated in his work entitled 'Kashmir und das Reich der Siek.'
- 1850.—**Col. John Ch. Frémont**—Patron's Medal—for his successful explorations of the Rocky Mountains and California; and for his numerous Discoveries and Astronomical Observations.  
The Rev. DAVID LIVINGSTONE, of Kolobeng—a Chronometer Watch—for his successful explorations of South Africa.
- 1851.—**Dr. GEORGE WALLIN**, of Finland—25 Guineas—for his Travels in Arabia.  
**Mr. THOMAS BRUNNER**—25 Guineas—for his explorations in the Middle Island of New Zealand.
- 1852.—**Dr. John Rae**—Founder's Medal—for his survey of Boothia and of the Coasts of Wollaston and Victoria Lands.  
**Captain Henry Strachey**—Patron's Medal—for his Surveys in Western Tibet.
- 1853.—**Mr. Francis Galton**—Founder's Medal—for his explorations in Southern Africa.  
**Commander E. A. Inglefield**, R.N.—Patron's Medal—for his Survey of the Coasts of Baffin Bay, Smith and Lancaster Sounds.
- 1854.—**Rear-Admiral William Henry Smyth**—Founder's Medal—for his valuable Surveys in the Mediterranean.  
**Captain Robert J. M. M'Clure**, R.N.—Patron's Medal—for his discovery of the North-West Passage.
- 1855.—**The Rev. David Livingstone**, M.D., &c.—Patron's Medal—for his Scientific Explorations in Central Africa.  
**Mr. CHARLES J. ANDERSSON**—A Set of Surveying Instruments—for his Travels in South-Western Africa.



- 1856.—**Elisha Kent Kane**, M.D.—Founder's Medal—for his discoveries in the Polar Regions.  
**Heinrich Barth**, PHIL. DR.—Patron's Medal—for his explorations in Central Africa.  
 Corporal J. F. CHURCH, of the Royal Engineers—a Watch and Chain—for his scientific observations while attached to the Mission in Central Africa.
- 1857.—**Mr. Augustus C. Gregory**—Founder's Medal—for his explorations in Western and Northern Australia.  
**Lieut. - Col. Andrew Scott Waugh**, Bengal Engineers—Patron's Medal—for the Great Trigonometrical Survey of India.
- 1858.—**Captain Richard Collinson**, R.N.—Founder's Medal—for his Discoveries in the Arctic Regions.
- 1858.—**Prof. Alexander Dallas Bache**, Superintendent U. S. Coast Survey—Patron's Medal—for his extensive Surveys of America.
- 1859.—**Captain Richard F. Burton**—Founder's Medal—for his Explorations in Eastern Central Africa.  
**Captain John Palliser**—Patron's Medal—for his explorations in British North America and the Rocky Mountains.  
 Mr. JOHN MACDOUALL STUART—a Gold Watch—for his Discoveries in South and Central Australia.
- 1860.—**Lady Franklin**—Founder's Medal—in commemoration of the discoveries of Sir J. Franklin.  
**Captain Sir F. Leopold McClintock**, R.N.—Patron's Medal—for his Discoveries in the Arctic Regions.
- 1861.—**Captain John Hanning Speke**—Founder's Medal—for the Discovery of the Great Lake Victoria Nyanza, Eastern Africa, &c.  
**Mr. John Macdouall Stuart**—Patron's Medal—for his Explorations in the Interior of Australia.
- 1862.—**Mr. Robert O'Hara Burke**—Founder's Medal—for his Explorations in Australia.  
**Captain Thomas Blakiston**—Patron's Medal—for his survey of the River Yang-tze-kiang.  
 Mr. JOHN KING—a Gold Watch—for his meritorious conduct while attached to the Expedition under Mr. R. O'Hara Burke.
- 1863.—**Mr. Frank T. Gregory**—Founder's Medal—for his explorations in Western Australia.  
**Mr. John Arrowsmith**—Patron's Medal—for the very important services he has rendered to Geographical Science.  
 Mr. WILLIAM LANDBOROUGH—a Gold Watch—for successful Explorations in Australia.  
 Mr. JOHN M'KINLAY—a Gold Watch—for successful Explorations in Australia.  
 Mr. FREDERICK WALKER—a Gold Watch—for successful Explorations in Australia.
- 1864.—**Captain J. A. Grant**—Patron's Medal—for his journey from Zanzibar across Eastern Equatorial Africa to Egypt, in company with Captain Speke.  
**Baron C. von der Decken**—Founder's Medal—for his two Geographical Surveys of the lofty Mountains of Kilima-njaro.  
 Rev. W. GIFFORD PALGRAVE—the sum of 25 Guineas—for the purchase of a Chronometer or other Testimonial, for his adventurous Journey in and across Arabia.
- 1865.—**Captain T. G. Montgomerie**, R.E.—Founder's Medal—for his Trigonometrical Survey of North-West India.

**Mr. S. W. Baker**—Patron's Medal—for his relief of Capts. Speke and Grant, and his endeavour to complete the discoveries of those travellers.

**Dr. A. VÁMBÉRY**—the sum of 40 Pounds—for his Travels in Central Asia.

1866.—**Dr. Thomas Thomson, M.D.**—Founder's Medal—for his Researches in the Western Himalayas and Thibet.

**Mr. W. Chandless**—Patron's Medal—for his Survey of the River Purús.

**M. P. B. DU CHAILLU**—the sum of 100 Guineas—for his Astronomical Observations in the Interior of Western Equatorial Africa.

**MOOLA ABDUL MEDJID**—a Gold Watch—for his Explorations over the Pamir Steppe, &c.

1867.—**Admiral Alexis Boutakoff**—Founder's Medal—for being the first to launch and navigate ships in the Sea of Aral.

**Dr. Isaac I. Hayes**—Patron's Medal—for his memorable expedition in 1860-61 towards the open Polar Sea.

1868.—**Dr. Augustus Petermann**—Founder's Medal—for his zealous and enlightened services as a writer and cartographer in advancing Geographical Science.

**Mr. Gerhard Rohlfs**—Patron's Medal—for his extensive and important travels in the interior of Northern Africa.

The **PUNDIT** employed by Captain T. G. Montgomerie—a Gold Watch—for his route survey from Lake Mansarowar to Lhasa, in Great Thibet.

EDUCATIONAL PRIZE:—

**Mr. JOHN WILSON**—the sum of Five Pounds—for successful competition in Geography at the Society of Arts examination.

1869.—**Professor A. E. Nordenskiöld**—Founder's Medal—for the leading part he took in the recent Swedish Expeditions in the North Polar Region.

**Mrs. Mary Somerville**—Patron's Medal—in recognition of the able works published by her, which have largely benefited Geographical Science.

SCHOOLS' PRIZE MEDALS:—

*Political Geography.*—**HY. G. RICHMOND**, Liverpool College (Gold Medal).

**JAS. DEARDEN WILDE**, Manchester Grammar School (Bronze Medal)

*Physical Geography.*—**WM. GRUNDY**, Rossall School (Gold Medal).

**GEO. WM. GENT**, Rossall School (Bronze Medal).

EDUCATIONAL PRIZE:—

**Mr. JOHN KIDNEY**—the sum of Five Pounds—for successful competition in Geography at the Society of Arts examination.

1870.—**Lieutenant Fras. Garnier** (of the French Imperial Navy)—Patron's Medal—for his survey of the course of the great Cambodian River during the years 1866-8.

**Mr. George W. Hayward**—Founder's Medal—For his explorations in Eastern Turkistan.

SCHOOLS' PRIZE MEDALS:—

*Political Geography.*—**GEO. WM. GENT**, Rossall School (Gold Medal).

**JAS. HY. COLLINS**, Liverpool College (Bronze Medal).

*Physical Geography.*—**GEO. GREY BUTLER**, Liverpool College (Gold Medal).

**MARTIN STEWART**, Rossall School (Bronze Medal).

EDUCATIONAL PRIZE:—

**Mr. THOMAS RICHARD CLARKE**—the sum of Five Pounds—for successful competition in Geography at the Society of Arts examination.



- 1871.—**Sir Roderick I. Murchison**, Bart.—Founder's Medal—in recognition of the eminent services he has rendered to Geography during his long connection with the Society.

**A. Keith Johnston**, LL.D.—Patron's Medal—for his long-continued and successful services in advancing Geography, and especially for his merit in carrying out his scheme of Physical Atlases.

**SCHOOLS' PRIZE MEDALS:—**

*Political Geography.*—**GEO. HOGGEN**, University School, Nottingham (Gold Medal).

**RICHD. NAYLOR ARKLE**, Liverpool College (Bronze Medal).

*Physical Geography.*—**DANIEL MCALISTER**, Liverpool Institute (Gold Medal).

**WM. GERSHOM COLLINGWOOD**, Liverpool College (Bronze Medal).

**EDUCATIONAL PRIZE:—**

**Mr. JOHN ARMSTRONG**—the sum of Five Pounds—for successful competition in Geography at the Society of Arts examination.

- 1872.—**Colonel Henry Yule**, C.B.—Founder's Medal—for the eminent services he has rendered to Geography in the publication of his three great works, 'A Mission to the Court of Ava,' 'Cathay, and the Way Thither,' and 'Marco Polo.'

**Mr. Robert Berkeley Shaw**—Patron's Medal—for his Journeys in Eastern Turkistan, and for his extensive series of Astronomical and Hypsometrical Observations, which have enabled us to fix the longitude of Yarkand, and have given us, for the first time, the basis of a new delineation of the countries between Leh and Kashgar.

**Lieut. G. C. MUSTERS**, R.N.—a Gold Watch—for his adventurous Journey in Patagonia, through 960 miles of latitude, of which 780 were previously unknown to Europeans.

**KARL MAUCH**—the sum of Twenty-five Pounds in acknowledgment of the zeal and ability with which he has devoted himself, for a series of years, to the Exploration of South-Eastern Africa.

**SCHOOLS' PRIZE MEDALS:—**

*Physical Geography.*—**S. E. SPRING RICE**, Eton College (Gold Medal).

**A. S. BUTLER**, Liverpool College (Bronze Medal).

*Political Geography.*—**W. G. COLLINGWOOD**, Liverpool College (Gold Medal).

**W. C. GRAHAM**, Eton College (Bronze Medal).

**EDUCATIONAL PRIZE:—**

**Mr. GEO. M. THOMAS**—the sum of Five Pounds—for successful competition in Geography at the Society of Arts Examination.

- 1873.—**Mr. Ney Elias**—Founder's Medal—for his survey of the Yellow River of China, in 1868; and for his recent journey through Western Mongolia.

**Mr. H. M. Stanley**—Patron's Medal—for his discovery and relief of Dr. Livingstone.

**Mr. THOMAS BAINES**—a Gold Watch—for his long-continued services to Geography, and especially for his journeys in South-Western and South-Eastern Africa.

**Captain CARLSEN**—a Gold Watch—for his discoveries in the Arctic Seas, and for having circumnavigated the Spitzbergen as well as the Nova Zembla groups.

**SCHOOLS' PRIZE MEDALS:—**

*Physical Geography.*—**W. C. HUDSON**, Liverpool College (Gold Medal).

**W. A. FORBES**, Winchester College (Bronze Medal).

*Political Geography.*—**S. E. SPRING RICE**, Eton College (Gold Medal).

**A. T. NUTT**, University College School (Bronze Medal).

1874.—**Dr. Georg Schweinfurth**—Founder's Medal—for his discovery of the Uelle River, beyond the South-western limits of the Nile basin; and for his admirable work, 'The Heart of Africa,' in which he has recorded the results of his travels.

**Colonel P. Egerton Warburton**—Patron's Medal—for his journey across the previously unknown Western Interior of Australia; from Alice Springs, on the line of overland telegraph, to the West Coast near De Grey River.

**SCHOOLS' PRIZE MEDALS:—**

*Physical Geography.*—**LOUIS WESTON**, City of London School (Gold Medal).

**FRANCIS CHARLES MONTAGUE**, University College School (Bronze Medal).

*Political Geography.*—**WILLIAM HARRY TURTON**, Clifton College, Bristol (Gold Medal).

**LIONEL JACOB**, City of London School (Bronze Medal).

1875.—**Lieut. Weyprecht**—Founder's Medal—for his explorations and discoveries in the Arctic Sea between Spitzbergen and Nova Zembla.

**Lieut. Julius Payer**—Patron's Medal—for his journey and discoveries along the coast of Franz-Josef's Land, between Spitzbergen and Nova Zembla.

**W. H. JOHNSON**—Gold Watch—for services rendered to Geography while engaged in the Great Trigonometrical Survey of India among the Himalayas.

**SCHOOLS' PRIZE MEDALS:—**

*Physical Geography.*—**HENRY ALEXANDER MIERS**, Eton College (Gold Medal).

**ARCHIBALD EDWARD GARROD**, Marlborough College (Bronze Medal).

*Political Geography.*—**SIDNEY H. B. SAUNDERS**, Dulwich College (Gold Medal).

**WM. C. GRAHAM**, Eton College (Bronze Medal).

1876.—**Lieut. V. Lovett Cameron**, R.N.—Founder's Medal—for his journey across Africa from Zanzibar to Benguela, and his survey of the Southern half of Lake Tanganyika.

**Mr. John Forrest**—Patron's Medal—in recognition of the services to Geographical Science rendered by his numerous successful explorations in Western Australia, and especially for his admirably executed route-survey across the interior from Murchison River to the line of Overland Electric Telegraph.

**SCHOOLS' PRIZE MEDALS:—**

*Physical Geography.*—**JOHN WILKIE**, Liverpool College (Gold Medal).

**WALTER NEW**, Dulwich College (Bronze Medal).

*Political Geography.*—**THOMAS KNOX**, Haileybury College (Gold Medal).

**W. M. H. MILNER**, Marlborough College (Bronze Medal).

**CAMBRIDGE LOCAL EXAMINATIONS PRIZE MEDAL:—**

**F. H. GLANVILL**, Devon County School (Silver Medal).

**OXFORD LOCAL EXAMINATIONS PRIZE MEDALS:—**

**JOHN WILKIE**, Liverpool College (Silver Medal).

**H. M. WARD**, Bridgnorth Grammar School (Bronze Medal).

1877.—**Captain Sir George S. Nares**, R.N., K.C.B.—Founder's Medal—for having commanded the Arctic Expedition of 1875-6, during which the ships and sledge-parties respectively reached a higher Northern latitude than had previously been attained, and a survey was accomplished of 300 miles of coast-line, facing a previously unknown Polar Sea; also for his Geographical services in command of the *Challenger* Expedition.



**The Pundit Nain Singh**—Patron's Medal—for his great journeys and surveys in Tibet and along the Upper Brahmaputra, during which he determined the position of Lhása, and added largely to our positive knowledge of the Map of Asia.

**Captain A. H. MARKHAM, R.N.**—a Gold Watch—for having commanded the Northern Division of sledges in the Arctic Expedition of 1875-6, and for having planted the Union Jack in  $83^{\circ} 20' 26''$  N., a higher latitude than had been reached by any previous Expedition.

**SCHOOLS' PRIZE MEDALS:—**

*Physical Geography.*—WALTER NEW, Dulwich College (Gold Medal).

ARTHUR SMYTH FLOWER, Winchester College (Bronze Medal).

*Political Geography.*—WILLIAM JOHN NEWTON, Liverpool College (Gold Medal).

JOHN WILKIE, Liverpool College (Bronze Medal).

**CAMBRIDGE LOCAL EXAMINATIONS PRIZE MEDALS:—**

H. C. TEMPLE, Brighton Grammar School (Silver Medal for Physical Geography, and Silver Medal for Political Geography).

**OXFORD LOCAL EXAMINATIONS PRIZE MEDALS:—**

JOHN EDWARD LLOYD, Chatham Institute, Liverpool (Silver Medal).

JAMES EDWIN FORTY, City Middle-Class School (Bronze Medal).

**1878.—Baron F. von Richthofen**—Founder's Medal—for his extensive travels and scientific explorations in China, during which he mapped a great part of the Northern and Central Provinces of the Empire, and made observations of great interest and originality on their Physical Geography; also for his great work now in course of publication, in which the materials accumulated during his long journeys are elaborated with remarkable lucidity and completeness.

**Captain Henry Trotter, R.E.**—Patron's Medal—for his services to Geography, in having conducted the Survey operations of the late Mission to Eastern Turkistan, under Sir Douglas Forsyth, which resulted in the connection of the Trigonometrical Survey of India with Russian Surveys from Siberia; and for having further greatly improved the map of Central Asia by uniting his own work on the Upper Oxus with the exploration of the Mullah and Havildar further to the West, so as to give, for the first time, a nearly continuous delineation of the course of the river, and its sources in the Pamir Lakes to the frontiers of Balkh.

**SCHOOLS' PRIZE MEDALS:—**

*Physical Geography.*—WILLIAM JOHN NEWTON, Liverpool College (Gold Medal).

CHRISTOPHER MOUNSEY WILSON, Clifton College (Silver Medal).

*Political Geography.*—WILLIAM WALLACE ORD, Dulwich College (Gold Medal).

GEORGE ARNOLD TOMKINSON, Haileybury College (Silver Medal).

**CAMBRIDGE LOCAL EXAMINATIONS PRIZE MEDALS:—**

P. W. EVANS, Cardiff (Silver Medal for Physical Geography).

J. HAYNES, West Buckland (Silver Medal for Political Geography).

**OXFORD LOCAL EXAMINATIONS PRIZE MEDALS:—**

ARTHUR EDWIN RESTARICK, North London College School (Silver Medal).

FREDERICK WILLIAM KELLETT, Kingswood and Woodhouse Grove School (Bronze Medal).

1879.—**Colonel N. Prejevalsky**—Patron's Medal—for his successive Expeditions in the years 1870-3 to Mongolia and the high plateau of Northern Tibet; in the course of which he made a route-survey of 3500 miles of previously unexplored country; also for his journey from Kulja to Lob-Nor in 1876-7, and for the admirable way in which he has described these regions and their products in the published narratives of his travels.

**Captain W. J. Gill, R.E.**—Founder's Medal—for the important Geographical work he has performed during two long journeys of Exploration, voluntarily undertaken, along the northern frontier of Persia in 1873, and in Western China and Tibet in 1877; and especially for the traverse-survey made by him during the latter journey, and the very complete maps of his route, in forty-two sheets, on a scale of two miles to the inch.

**SCHOOLS' PRIZE MEDALS :—**

*Physical Geography.*—MATTHEW GEORGE GRANT, Liverpool College (Gold Medal).

FRANK TAYLOR SHARPE, Liverpool College (Silver Medal).

*Political Geography.*—DAVID BOWIE, Dulwich College (Gold Medal).

CLAUDE L. BICKNELL, Harrow School (Silver Medal).

**CAMBRIDGE LOCAL EXAMINATIONS PRIZE MEDALS :—**

J. R. DAVIS (Silver Medal for Physical Geography).

MISS HELEN JONES (Silver Medal for Political Geography).



# PRESENTATION

## OF THE

# ROYAL AND OTHER AWARDS.

*(At the Anniversary Meeting, May 27th, 1878.)*

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### ROYAL MEDALS.

THE FOUNDER'S MEDAL to Baron F. von RICHTHOFEN. For his extensive travels and scientific explorations in China, during which he mapped a great part of the Northern and Central Provinces of the Empire, and made observations of great interest and originality on their Physical Geography; also for his great work now in course of publication, in which the materials accumulated during his long journeys are elaborated with remarkable lucidity and completeness.

THE PATRON'S MEDAL to Captain HENRY TROTTER, R.E. For his services to Geography, in having conducted the Survey operations of the late Mission to Eastern Turkistan, under Sir Douglas Forsyth, which resulted in the connection of the Trigonometrical Survey of India with Russian Surveys from Siberia; and for having further greatly improved the map of Central Asia by uniting his own work on the Upper Oxus with the exploration of the Mullah and Havildar further to the West, so as to give, for the first time, a nearly continuous delineation of the course of the river, from its sources in the Pamir Lakes to the frontiers of Balkh.

H. E. the German Ambassador attended to receive the Medal on behalf of Baron von Richthofen.

The PRESIDENT addressed him as follows:—

“In handing this Medal to your Excellency, I may recapitulate the various claims which this eminent Geographer has to our consideration, and which have obtained for him, by unanimous vote of

our Council, the award of the highest honour in our power to bestow. Baron von Richthofen travelled in various parts of the East and North Pacific for upwards of twelve years. He devoted four years—1868-72—to a systematic exploration of China—chiefly of its Geology and Physical Geography, but not neglecting any branch of science bearing upon the main object of his studies. During the four years he made seven long journeys through China, traversing from end to end twelve of its provinces—from Moukden and Peking to Canton, and from Shanghai to Ching-tu-fu, near the borders of Tibet. He mapped the country as he travelled, on a scale of 1 in 450,000, i.e. about 7 miles to the inch; paying particular attention to the direction of the mountain-ranges, and to vertical configuration generally, which had been almost entirely neglected in former maps of China. His cartographic work is now being published, with the aid of R. Kiepert, in an Atlas, which will contain forty-four maps. He is publishing the results of his explorations in a work, the first volume of which appeared last year. Of this work Colonel Yule says in a letter to myself:—‘Though his book is vast and copious, there is not a dull page in it. He possesses a remarkable power of lucid and interesting composition. Nor is it confined even ostensibly to Physical Geography; it throws new light on many questions, whilst in it the author is frequently bringing up that relation of history to natural conformation with which he deals in so powerful a way. In his person are combined the great traveller, the great physical geographer, and the accomplished writer, in a degree unknown since Humboldt’s best days. In the actual extent of his journeys in China he has covered far more ground than any other traveller of note, and he has steadily mapped as he went. His faculty of applying his geological knowledge to the Geography of the country he traverses is very remarkable.’

“With these remarks, permit me to place in your Excellency’s hands this Medal, for transmission to your distinguished countryman.”

His Excellency Count MUNSTER, in reply, said this was the second time that he had had the great honour of receiving this distinction for one of his countrymen. Baron Richthofen had asked him to express his deep regret that he could not have the satisfaction of personally receiving the Medal from the hands of the President. He thanked the Society most sincerely for this token of recognition of his works, and it would give him new courage in his efforts to promote geographical knowledge. He hoped that



England and Germany would always try to be foremost in the promotion of civilisation and geographical research.\*

The PRESIDENT then handed the Patron's Medal to Captain H. Trotter, R.E., and, in doing so, said :—

“CAPTAIN TROTTER,

“In your capacity as Geographer to Sir Douglas Forsyth's Mission to Kashghar in 1873, you very carefully surveyed the high plateaux and mountain-ridges lying between Leh and the Kuen-lun, and made scientific explorations of many wide tracts, both there and to the north of Kashghar, and on the Pamir Steppe; of which we had previously either no knowledge at all, or only the vaguest information. Thus to the north of Kashghar you carried a series of measurements as far as Chadyr-Kul, and thereby connected the Trigonometrical Survey of India with the Russian Surveys from Siberia.

“But these great services, and the admirable Reports you published on your surveys, are not your only title to our consideration. It was you to whom the Scientific world are indebted for the initiation of the last memorable route-survey of the Pundit Nain Singh; yourself, as Surveyor to the Kashghar Expedition, having despatched that able native traveller from Leh on the journey which led through Tibet, from north-west to south-east, and across the Himalaya into Assam. And on his return, it was you who digested his rough itineraries and observations, and drew up the Report and Map which made known to the world the work that

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\* The following letter of acknowledgment had previously been received from Baron von Richthofen :—

“DEAR SIR RUTHERFORD,—The information which you have been kind enough to give me, that the Council of the Royal Geographical Society has, on your proposal, awarded me the Founder's Medal, has come so unexpectedly that I can hardly yet find words to express my feelings. It is the highest of honours which can be conferred upon any Geographer in our time, and I feel deeply thankful that the Council has taken notice in so candid and magnanimous a spirit of my humble labours as to find me worthy of this distinction. I consider it, indeed, the greatest and most valuable mark of appreciation I ever received, and I hardly feel as if I had deserved it by what I have as yet accomplished. It will, however, be a powerful stimulant for me to devote all my energy to the continuation of my work, and I hope that my love of geography will help me to make up in the future for past deficiencies. It is particularly gratifying to me that it is on your proposal the Council has been pleased to decide in my favour, your name and the memory of your hospitable house being so intimately and so very pleasantly connected with my work in foreign countries. I shall not be able, to my great regret, to be personally present at the Meeting of the 27th of May, as both family affairs and business will keep me here; but I will not fail to ask the favour of his Excellency Count Münster to give expression to my gratitude.—Yours very truly, FR. VON RICHTHOFFEN.”

had been accomplished, and gained for the Pundit a year before yourself the Gold Medal of the Society."

Captain TROTTER replied as follows —

"I thank you, Mr. PRESIDENT, sincerely for this very handsome token of the Society's appreciation of the work I have been enabled to do for the advancement of geographical science. Some of the most pleasant moments passed by the traveller in distant lands are spent in thoughts of home, and of the kind reception he may expect to meet with if he has the good fortune to return. It is not given to all, as it has been to me, to realise this anticipation, and my comrade, Dr. Stoliczka, who accompanied me in all my wanderings through Central Asia, died a martyr to duty, when within a few days of the end of our journey. It is a great satisfaction to me to find myself supported here to-day by Sir Douglas Forsyth, who so ably conducted the embassy to Kashghar, and whose zeal for Geography afforded me those opportunities which have been the cause of my being in the honourable position I occupy at the present moment. In the Indian Survey Department, to which I have the honour to belong, there are others as capable and more capable than myself of carrying out those duties it has been my good fortune to have allotted to me. Two very distinguished former members of that Survey, Sir Andrew Waugh and Colonel Montgomerie, both Gold Medallists of this Society, have passed away within the last few months; but it is a source of great gratification to me, and will doubtless prove equally so to my brother officers in the Survey, to know that they will still be represented on the illustrious roll of Medallists of the Royal Geographical Society, an honour which is appreciated not only in England but throughout the world."

The PRESIDENT announced that at a Meeting of the Council on March 28th, it was ordered that the following Resolution should be appended to the announcement of the award of Medals for the present year:—

"Mr. H. M. Stanley's discovery of the course of the Congo is the greatest geographical event of the year; and his name would undoubtedly have been proposed for the award of one of the Royal Medals of this year, had he not in 1873 received a Medal for the discovery and the relief of the late Dr. Livingstone.

"In acknowledgment of Mr. H. M. Stanley's eminent services to Geography, it is unanimously resolved that he receive the thanks of the Council of the Royal Geographical Society, and be elected an Honorary Corresponding Member."



## PUBLIC SCHOOLS' PRIZE MEDALS.

The following was the award of the Examiners for the present year :—

PHYSICAL GEOGRAPHY. *Gold Medal*.—William John Newton, Liverpool College. *Silver Medal*.—Christopher Mounsey Wilson, Clifton College. *Honourably Mentioned*.—Ernest George Harmer, University College School, and Miller Hancorne Clifford, Dulwich College (*Equal*); Francis Ashness Soppitt, Dulwich College; John Stapylton Grey Pemberton, Eton College.

POLITICAL GEOGRAPHY. *Gold Medal*.—William Wallace Ord, Dulwich College. *Silver Medal*.—George Arnold Tomkinson, Haileybury College. *Honourably Mentioned*.—Arthur Reed Ropes, City of London School; Arthur Kay, Rossall School; David Bowie, Dulwich College.

Mr. F. GALTON said he had great pleasure in announcing the continued success of the Public Schools' competition. It was gratifying to find that the Schools which sent candidates for the first of these examinations continued to do so, showing that they had found by experience that the teaching of geography did not interfere with other branches of study. Out of the forty Medals which had been given in the past ten years, no less than twelve had been gained by Liverpool College; Eton had gained five; and Rossall and Dulwich four each. There could be no doubt that the effect of these Medals had been to increase the standard of geographical teaching in schools. Some years ago a certain school sent candidates, whose performances were so bad that he felt it his duty to communicate privately with two of the Governors. The result was that the teaching there had steadily improved, and that school had since been one of the most successful. He wished to mention what had been done recently towards advancing geographical teaching. First and foremost was the publication of that excellent book by Professor Huxley, 'Physiography,' which had had an enormous circulation. Starting from the simplest elements, it led students steadily on to the higher conception of physical geography and the most recent discoveries in it. Sir Walter Trevelyan, a former Secretary of this Society, had felt so much the necessity of a better form of text-book for geographical teaching, that he had placed a handsome sum at the disposal of the Council, to procure, if they were able to do so, the compilation of a really good small county geography, to serve as an example for other similar works to be used in elementary schools. The Committee had received a letter from a master of

one of the great public schools, urging them to plan a system of diagrams explanatory of different physical features. His own opinion was that what was most urgently needed was some simple and well-methodised system of experiments, suitable to illustrate lectures on the main features of physical geography. In the Royal Institution Professor Tyndall had shown experimentally how clouds were created, how the blue colour of the sea and the blue colour of the sky were produced, the effects of the regelation of ice, and many other facts of physical geography. In that very room Dr. Carpenter had demonstrated experimentally to a large audience the conditions by which, in his opinion, the great oceanic currents from the Pole to the Equator were produced. He had no doubt that an extension of the methods of illustrating the facts of physical geography on a small scale and on a lecture-room table was perfectly feasible. Thus, as every thunder-shower showed in the streets the phenomena of erosion and deposition, he had no doubt that on a lecture-table, with a can to supply water, and with a certain quantity of sand, gravel, and clay, all the main phenomena of river-action, such as the sifting of materials, the stratification of deposits, and the formation of deltas, might be successfully shown.

Colonel GRANT, in introducing to the President the Medallists for Physical Geography, said he had examined the papers of eighteen candidates, and William John Newton, of Liverpool College, stood pre-eminent. His answers were so lucid, so brief, and so much to the point, that he had no hesitation in saying he surpassed all the other candidates. The Silver Medal had been won by Christopher Mounsey Wilson, of Clifton College, who for one-third of his answers received the highest marks that could be given. Two other candidates, Clifford and Harmer, ran him very close, and he had some difficulty in separating them from Wilson.

Sir RAWSON RAWSON reminded the Meeting that W. J. Newton had received the Gold Medal last year for Political Geography; and the PRESIDENT stated further that he had been on the "honourable mention" list the year before last, so that, besides the ability which he had shown, he had distinguished himself by great perseverance.

The Medals were then handed to the successful candidates.

Mr. CLEMENTS MARKHAM introduced the Medallists in Political Geography. The Gold Medallist, Ord, he said, had shown very remarkable knowledge, both of the general and the special subjects of Examination.



The PRESIDENT handed to the two candidates the Medals for Political Geography.

The Hon. G. C. BRODRICK announced that the Special Subject for next year would be the Barbary States and the Sahara. Last year it was the Nile Basin, so that the Society had not, on this occasion, made the circuit of the globe in its choice of a subject. Perhaps the chief interest of the special subject which he had just announced lay in the great Desert of the interior, but the chief historical and political interest was in connection with those countries on the borders of the Mediterranean which had been successively colonised or conquered by the Phœnicians, the Greeks, the Romans, the Vandals, the Arabs, and the French. Considering that Africa was now but three days' journey from London, and that a public schoolmaster, Mr. Bosworth Smith, of Harrow, was able in the course of an Easter holiday to explore the ruins of ancient Carthage and its neighbourhood, it was certainly astonishing that so little attention had been devoted to that region. He hoped that one result of the selection of this subject would be to induce some of the younger geographers to visit the district for themselves.

The Scrutineers announced the result of the ballot as follows (the names printed in italics being new Members or those who change office):—*President: Right Hon. the Earl of Dufferin, K.P., &c. Vice-Presidents: Sir Rutherford Alcock, K.C.B., &c.; Admiral Sir Alexander Milne, Bart., G.C.B.; Major-General Sir H. C. Rawlinson, K.C.B., &c.; Sir Harry C. Verney, Bart. Treasurer: Reginald T. Cocks, Esq. Trustees: Lord Houghton, D.C.L., F.R.S.; Sir Walter C. Trevelyan, Bart. Secretaries: Clements R. Markham, Esq., C.B., F.R.S.; R. H. Major, Esq., F.S.A. Foreign Secretary: Lord Arthur Russell, M.P. Councillors: Sir Henry Barkly, G.C.M.G., K.C.B.; Hon. G. C. Brodrick; Sir T. Fowell Buxton, Bart.; Right Hon. Lord Cottesloe; Robert Needham Cust, Esq.; Sir Barrow H. Ellis, K.C.S.I.; Capt. F. J. O. Evans, R.N., C.B.; Sir T. Douglas Forsyth, K.C.S.I., C.B.; Douglas W. Freshfield, Esq.; Francis Galton, Esq., F.R.S.; Colonel J. A. Grant, C.B., C.S.I., F.R.S.; Major-General Sir W. H. R. Green, K.C.S.I.; Gen. Sir J. H. Lefroy, R.A., K.C.M.G., F.R.S.; W. Mackinnon, Esq.; Admiral Sir F. Leopold M'Clintock, F.R.S.; Sir William L. Merewether, K.C.S.I., C.B.; John Murray, Esq.; Admiral Sir Erasmus Ommanney, C.B.; Sir Rawson W. Rawson, K.C.M.G., C.B.; Major-General C. P. Rigby; S. W. Silver, Esq.*

The PRESIDENT delivered the Annual Address.

Sir H. RAWLINSON proposed a vote of thanks to Sir Rutherford

Alcock. The Address which they had just heard, seemed to him to equal in lucidity and interest any which had previously been delivered from the Geographical chair. It reminded him of those brilliant Addresses which the Society had so often heard from Sir Roderick Murchison, and which commanded the attention not only of this country but of geographers throughout Europe. It must be remembered that this was the last occasion on which Sir Rutherford would occupy the chair. No one could speak more feelingly than himself of the duties of a President. There was, no doubt, great honour in the position, but it necessitated a vast amount of self-sacrifice, and work of a severe and not always of the most agreeable character. Sir Rutherford deserved the special thanks of the Society for the way in which he had performed his duties. The ability he had displayed on all public occasions commanded their respect for him as President, while the singular urbanity which he had always shown in his communications with the members must have endeared him to all as a friend. With every admiration for the private character and public services of Lord Dufferin, and with every hope and expectation that he would successfully conduct their affairs, he still felt that he could not devote himself more assiduously, and with greater singleness of purpose, to the office of President than Sir Rutherford Alcock; and he trusted that Sir Rutherford, following his own example, might, after a year or two of relaxation, again occupy a post from which, much to their regret, he was now retiring.

Sir H. VERNEY seconded the vote of thanks. He said that those who had attended most regularly and worked with Sir R. Alcock on Committees, could most truly appreciate the great services that he had rendered to the Society. No one could exaggerate the trouble he had taken for its welfare and advantage. The last few years had been a period of considerable difficulty, and had it not been for the good temper, judgment, patience, and courtesy of the President, circumstances might have occurred which would have been most injurious to the Society. They were all extremely indebted to him for the way in which he had steered them through those difficulties. During many years Sir Rutherford discharged duties of the utmost importance to his country in distant parts of the world, and promoted, as far as it was in his power, the best interests, political and commercial, and the honour of England. He would refer especially to the measures he took, and to those which he sought to carry, with regard to the Indo-British opium traffic. One of the glories of this country was the willingness of distinguished men to discharge public duties without remuneration. He



believed that ours was the only country in which this was to be found, and Sir Rutherford Alcock had devoted himself, for no fee or reward, to the interests of the Society for two years.

The Resolution was agreed to.

The PRESIDENT said he had been touched by the particularly kind and generous way in which his poor services had been estimated by Sir Henry Rawlinson, who had himself for a long period performed the arduous duties which sometimes devolved upon the President. As had been said, the last two years had been rather troubled times, and he had sometimes wished that some one else more competent to deal with them had been the President, but thanks to the good feeling of the great body of the Society, and thanks especially to the loyal and efficient services that the Council always rendered to the President, they had worked through all their difficulties, and he believed with benefit to the Society. In that reflection he had the best, the only reward he desired, except the approval of the Members.

Sir H. BARKLY moved a vote of thanks to the retiring Members of the Council, the Committees, the Auditors, the Secretaries, and the Scrutineers.

Mr. J. S. DYASON seconded the Resolution, which was agreed to, and the proceedings terminated.

## A D D R E S S

TO

## THE ROYAL GEOGRAPHICAL SOCIETY.

*Delivered at the Anniversary Meeting on the 27th May, 1878.*

BY SIR RUTHERFORD ALCOCK, K.C.B., ETC., PRESIDENT.

GENTLEMEN,

THE Council's Report, which you have heard read, shows the steady progress of the Society; 187 new Fellows have been elected during the year, and the finances are in a satisfactory state. Great activity has been shown in all departments: in the Library, Map-room, and publications of the Society. The editing of the 'Proceedings' from month to month, and the 'Journal' annually, entrusted to Mr. Bates, the Assistant-Secretary, is a work of great labour, which could only be accomplished by one possessing special aptitude and qualifications for the task. It is but an act of justice to say that for these valuable and permanent records of Geographical progress and research the Society is mainly indebted to this officer. Without his unremitting industry and zeal it would be impossible for any one single-handed to deal satisfactorily with such a mass of material as the Papers forwarded to the Society constantly supply, to say nothing of a large correspondence.

Nor can it be otherwise than a subject of congratulation, that there has been a marked and rapid increase in the number of Geographical Societies both in Europe and America. There are now thirty-eight, and some of these, like the Italian, number their members by thousands;\* showing the popularity of the subject, and the general sense entertained among civilised nations of the utility of the Science, and the importance of a systematic prosecution of Geographical research in regions still imperfectly known. Nor is this interest limited to individuals or to Geographical Societies, for

\* The Italian Geographical Society numbered 2200 members at their last Anniversary.



many Governments, even within the last year, have obtained grants in their respective Parliaments, of considerable amount, in aid of exploratory undertakings.

We have further to congratulate ourselves on the continuation of the privilege, accorded to us by the Senate of the London University, of holding our meetings in this commodious Hall; our cordial thanks for which special favour it is my pleasure and duty to record in this place.

With these few words by way of introduction, I now proceed to the sad duty which annually devolves upon the President of noticing the losses sustained by the Geographical Society from the decease of numerous members during the year.

#### OBITUARY.

Captain JAMES FREDERICK ELTON, late British Consul at Mozambique, the accomplished traveller whose recent loss we have all so much deplored, was born on the 3rd of August, 1840. He was the second son of the late Lieut.-Colonel Roberts W. Elton, of the 59th Regiment, Bengal Army, and grandson of Jacob Elton, Esq., of Dedham, Essex. Captain Elton entered the Bengal army at the time of the Indian Mutiny, and saw much service with several regiments during that eventful epoch. He was with the relieving armies at the retaking of Lucknow and Delhi, and subsequently served for some years as aide-de-camp to General Sir Hugh Rose (Lord Strathnairn), then Commander-in-chief of India. For these services Captain Elton received the Indian medal with two clasps. In 1860 he volunteered for service in China, and was present at the taking of Peking and in other engagements, receiving the China medal after the campaign. Shortly after obtaining his captaincy he quitted the English service. In 1866 he joined the staff of the French army in Mexico during the unfortunate Maximilian episode, and on his return to England at the conclusion of the war he published a book entitled, 'With the French in Mexico,' which attracted some attention at the time. In 1868 he went to Natal, and occupied his time in travelling about the colony till 1870, when he undertook a long journey of exploration from the Tati gold district down to the mouth of the Limpopo, his narrative of which, accompanied by an excellent map, was published in the 'Journal' of the Society, vol. xlii. In 1871 he was sent to make reports on the Gold and Diamond Fields, and was also employed on a diplomatic mission to settle differences with the

Portuguese authorities. In 1872 he was appointed Government Agent on the Zulu Frontier, which country he was well acquainted with. After some months thus spent, he returned to Natal to recover from a severe attack of fever, caused by his incessant work and exposure. While at Natal, he acted as protector of the immigrant native labourers, and became a member of the Executive and Legislative Councils. This work was not, however, suited to his energetic mind, and in 1873 he left Natal, intrusted with various important missions: one of which was to treat with the Governor-General of Mozambique and the Sultan of Zanzibar, regarding the laying down of a telegraph cable from Aden; the second, to inquire into the emigration of native labour from Delagoa Bay and to confer with the Governor-General of Mozambique; and the third, to meet Sir Bartle Frere at Zanzibar, and assist in considering the Slave-trade question. In 1873 he was appointed Assistant Political Agent and Vice-Consul at Zanzibar by Sir Bartle Frere. Thus he entered into direct Government employment after four years of hard work on the East Coast of Africa. Whilst occupying this post, he made an interesting journey along the coast country between Dar-es-Salaam and Quiloa, or Kilwa, an account of which, enriched with observations on the products of the country, is published, with a map supplied by him, in the 44th volume of our 'Journal.' In March 1875 he was appointed British Consul in Portuguese Territory, with residence at Mozambique. He was here engaged in many expeditions for the suppression of the slave-trade from this and other parts of the east coast, in the course of which he made numerous journeys by sea and land, to the south as far as Delagoa Bay, and over the Indian Ocean to the Seychelle Islands and Madagascar. Early in 1877 he undertook a more important expedition into the interior from Mozambique, as far as the Makua country, up the Lurio to the cataracts of the Bomba, descending again to Ibo; 450 miles of this journey were performed on foot. He then visited the Querimba Islands and explored the coast up to the frontier of the Zanzibar territory. Before starting on his last, and to him fatal, expedition to Lake Nyassa, Captain Elton sent to England the MS. of a book entitled 'Notes and Sketches in East Africa and on the Suppression of the Slave-trade, 1873-1877:' this book was not then published, but is now, with the addition of the narrative of his subsequent longer journey of exploration, preparing for publication during the present year. This last journey, of which we have had a brief account in



the paper read by Mr. Cotterill, at our Meeting of March 25th, commenced early in July last. In that month Captain Elton left Mozambique for the Zambezi and the Shiré rivers; his intention being to visit the Scottish Mission Stations on Lake Nyassa, explore the Lake and surrounding country, visit various chiefs connected with the slave-trade, and ascertain the possibility of a route from the north end of the Lake to Quiloa, at which seaport he proposed to embark in a steamer for Zanzibar, hoping to reach the latter place in November, or early in December. His mission to the chiefs and circumnavigation of the Lake were successfully accomplished, but with the land journey troubles began; the country was devastated by wars among the different tribes, portorage and food were often unobtainable, and instead of taking a direct route to the east, Captain Elton was compelled to travel by a very circuitous one to the north. He struggled on, full of hope, energetic to the last, till within a few miles of the town of Usekhe in Ugogo, on the caravan route between the coast opposite Zanzibar and Unyanyembe, when he sunk from malarious fever brought on by exposure and privation. He died on December 13th, 1877, aged thirty-seven years, and was buried about two miles from his last camp, under a large baobab-tree which overlooks the plains of Usekhe. Captain Elton's four companions—Messrs. Cotterill, Rhodes, Hoste, and Downie—placed his remains in their last resting-place, marked by a large wooden cross, and carved his initials on the tree which overshadows his grave.

Our late associate appears to have possessed to a remarkable degree the faculty of making friends. He was a man of great and varied talent, of high courage, and buoyant, adventurous temperament. Those who have had an opportunity of inspecting his journal, maps, and sketches of scenery and people, made during his last expedition, speak in high terms of the excellence and completeness of his narrative and the artistic finish of his drawings; and few who attended our meeting of the 25th of March could have failed to be impressed by the eloquent testimony which an old and gallant friend, General Beauchamp Walker, bore to the charm of his personal character. He was, moreover, a devoted public servant, carrying out with great energy and intelligence the important missions in suppression of the East African Slave Trade with which he was intrusted. The death of such a man, before he had yet attained the prime of life, has been universally regretted.

DR. THOMAS THOMSON.—By the death of Dr. Thomas Thomson the Society has lost one of the earliest and most energetic of Trans-Himalayan explorers, and the first who put into a connected form a really scientific account of the geography, geology, and botany of the vast and complicated mountain regions extending from the plains of the Punjab to Turkistan.

Dr. Thomson was eldest son of Dr. Thomas Thomson, F.R.S., the eminent Professor of Chemistry in the University of Glasgow; in which city the son was born on the 4th of December, 1817. He was educated at the High School and University of Glasgow, and took his degree there as Doctor of Medicine in 1839. At school he obtained very high honours in classics and mathematics, but throughout his college career he preferred to devote his energies to scientific studies. From early childhood he evinced a remarkable love of, and capacity for, science, both physical and biological, commencing with chemistry and mineralogy before he went to school, and at a later period devoting himself to conchology and entomology, and lastly botany.

When only seventeen years of age, he was, when geologising on the Firth of Clyde, the first discoverer and the describer of those beds of fossil mollusca on which so much of the evidence of the glacial era depends. His account of the position and character of the deposits at Dalmuir is written with the acuteness, fulness, and perspicuity of a trained geologist; and the deductions he draws from a comparison of their contents with those of the neighbouring seas, show singular powers of generalisation for so young a person. He states in this paper that though the species are identical with those existing in the Clyde, the proportion of common to scarce is completely inverted: whence he concludes that they cannot have been deposited during a period when the fauna of the Firth of Clyde was in every way the same as at present; but that they are referable to a very late Tertiary period, when the banks of the Clyde, at least as far as Glasgow, were covered by an arm of the sea.\*

It was his father's wish that he should make chemistry the profession of his life, and, to this end, for many years he worked a little

\* The title of young Thomson's paper is, "On a Deposit of recent Marine Shells at Dalmuir, Dumbartonshire," *Records of General Science*, vol. i. p. 131, February, 1835. This paper was published four years before that of Smith of Jordan Hill, on "Marine Beds resting on Till," which appeared in 1839 in the *Memoirs of the Wernerian Nat. Hist. Soc.*, vol. viii. p. 49, wherein an allusion is made to Thos. Thomson's discovery.



daily at the University Laboratory, finally spending a winter at Giessen under Liebig, who regarded him as one of his most promising pupils, and under whom he discovered pectic acid in carrots.

On entering the medical classes, however, he returned to botany, under the stimulating lectures of the late Sir William Hooker, attending his course and herborizations annually during the whole of his medical curriculum, being further encouraged thereto by his friend, now Sir Joseph Hooker, who had been his school-fellow, and was afterwards his constant college companion. After taking his degree, being determined to devote his life to science, and especially to botany, he resolved upon entering the service of the Honourable East India Company as an assistant-surgeon. On his arrival in Calcutta, early in 1840, he was appointed to the Curatorship of the Museum of the Asiatic Society, and had commenced the arrangement of its fine collection of minerals, when he was ordered off to take charge of a party of European recruits who were being sent to Affghanistan. Leaving Calcutta in the beginning of August, it was not till June of the following year that this long up-country march was concluded; he then arrived at Cabool, where, and at Ghuznee, three months of thorough enjoyment were spent in studying the geology of the country and in exploring a wholly unknown flora.

At Ghuznee he was attached to the 27th Regiment of Native Infantry, and had his first attack of fever, soon to be followed by the horrors of the Affghan campaign, of which he was one of the few survivors. Very shortly after he had quitted Cabool, the detachment left there was destroyed, excepting a few of its officers and men who fled to Ghuznee, where, along with Thomson's detachment, they were beleaguered during the winter of 1841-2, and where, after daily losses of their comrades by cold, sickness, starvation, and the enemy's fire, they capitulated, to be subsequently imprisoned by their treacherous and savage captors. From Ghuznee Dr. Thomson and his fellow prisoners were afterwards sent to Cabool, and from thence were being transported to Bokhara to be sold into slavery; but, on their arrival at Bamecan, they bribed their captor, for a ransom of 2000*l.* and a pension for life from the British Government, to conduct them back to the advancing British army of relief.

From Affghanistan Dr. Thomson returned to India, having lost all his collections and personal effects, and was stationed with his regiment at Moradabad till 1845, when he joined the army of the

Indus, and served with it throughout the Sutlej campaign; after which he returned to Moradabad, and was stationed at Lahore and Ferozepore till 1847. During this period he was always engaged in investigating the botany of the plains and outer Himalayas. Meanwhile Sir W. Hooker and other friends were actively exerting themselves to procure for him some scientific employment in India, which resulted in his being nominated one of three Commissioners appointed to lay down the territorial boundary between the Trans-Himalayan possessions of our ally the Rajah of Kashmir and the Tibetan provinces subject to China. The Commissioners were instructed, after so doing, to proceed to Léh, there to separate and travel each in such a direction as should seem to him most conducive to advancing our knowledge of the countries north of the Himalayas.

The Commissioners, consisting of Major Cunningham, of the Bengal Engineers, Captain Henry Strachey, and Dr. Thomson, left Simla early in August 1847, and followed the Sutlej valley to the Chinese frontier at Shipki, where they were to have met the Chinese Commissioners, who, however, did not appear. Permission to cross the frontier being refused, the party proceeded to Léh, where it arrived in October. Here Major Cunningham left for Kashmir, bent on archæology; Thomson, bent on geology, botany, and geographical discovery, proceeded northwards, crossed from the Indus to the Nubra valley, and traced the course of the Shayok to its confluence with the Indus, which he followed to Iskardo. Subsequently Captain Strachey also left on his journey south-eastward to the Mansarowar Lake. In December Thomson attempted to reach Kashmir by Dras, but, after severe suffering from cold and exposure, he, on arriving at Dras, found the Zoji La Pass closed, and was obliged to return to Iskardo, where he passed the remainder of the winter of 1847-8.

Early in the following spring, he attempted to trace the Indus downwards to its exit in the plains; but, on reaching Rondu, was prevented from proceeding further by the disturbed state of the valley. It is remarkable that no European has as yet followed this part of the Indus, which was for the first time explored only two years ago by a native in the service of the Trigonometrical Survey as related in another part of this Address. Returning to Iskardo, he again took the route to Kashmir, which he reached in April, and spent some months in studying the botany and geology of the valley, after which he returned to Léh, by Jamu, Kishtwar, and



Zaskar. From Léh he set out on a more extended exploring expedition northward, with the object of ascending the previously unscaled Kuen-luen Mountains, which separate Tibet from Eastern Turkistan. This he accomplished by following the valley of the Shayok River to its source at the Karakoram Pass, 18,200 feet above the sea, which he reached on the 19th of August, 1848. Dr. Thomson's return to India was made by Léh, Kashmir, and Jamu, at which last place he was detained for a considerable time by the unsettled state of the country during the second Sikh war.

The results of these extensive journeys were published after Dr. Thomson's return to England, in a narrative form, entitled, 'Western Himalayas and Tibet,' a work on which the President of this Society, Sir Roderick Murchison, when presenting the Founder's Medal to its author, pronounced the following eulogium: "Eminent among living naturalists, Dr. Thomson, in the course of his arduous expedition, in which botany was his chief object, traversed a large tract of wild and mountainous country hitherto unexplored, crossed, for the first time, the dividing range of the great Asiatic continent, brought back collections that link the labours of the Russian botanists in the north with those of the English in the south, and carefully laid down every feature in the physical geography and geology of the vast elevated region whence the Indus and its tributaries take their rise, amid glaciers and at enormous heights above the sea. Another rare merit is that he embodied these researches in a work which, whether for modesty of style, accuracy, as well as breadth of view, or as being the first to demonstrate the true physical structure of the mountain-masses of North-Western India, and to trace their water-systems, climate, and productions, must be considered as of the highest value by naturalists, geographers, and geologists. To Dr. Thomson we owe the abandonment of an idea long prevalent—that Tibet was an elevated plain or plateau; and with this fell also many subsidiary theories relating to the snow-line, glaciers, temperature, and climate, of Central Asia. In short, from the date of Thomson's researches, rational superseded conjectural geography as regarded that vast, and still to a great extent unexplored, area." . . . "Now, when I inform you, my associates, that for all these devoted and important services Dr. Thomson never received any reward, nor even public thanks, but, on the contrary, was left to publish his work at his own cost and to his heavy loss, you will all rejoice with me that, although we have much too long delayed our gift,

we have at last placed ourselves in a befitting position by rendering justice and all honour to such a distinguished man."

On returning to India he was stationed at Ferozepore, and six months' leave were allowed him to draw up his reports, and to put in order his immense collection for transmission to England. During this time, which under any circumstances was wholly insufficient for the purpose, he was repeatedly prostrated by fever. Being unable to obtain a prolongation of leave, he determined to take his furlough—to which he was entitled by length of service—and repair to Simla, where he recovered his health and completed his report. At Simla he added greatly to his botanical observations and collections.

Before leaving India for England, he determined to visit his old friend, Dr. (now Sir Joseph) Hooker, who had been travelling in the Eastern Himalayas while he was in the Western. On reaching the plains he was again attacked by fever of a virulent type, during a stay at the Botanic Gardens of Saharunpore; and from the effects of this fever on a constitution already enfeebled by previous illness and great hardships he never completely recovered. He arrived at Darjeeling, in the Sikkim Himalayas, in the winter of 1848, to find his friend a prisoner in the power of the Sikkim Rajah, from which he did not escape till some weeks after his arrival.

The prospect of a year's travelling with one whose pursuits so entirely accorded with his own tastes, induced him to abandon his intention of returning to England. He endeavoured, through that friend's interest with the Governor-General, to obtain an extension of leave for the purpose of spending a year in scientific explorations; but the powers that then ruled India had no sympathy with science; medical officers were scarce, and no concession was obtainable. Dr. Thomson, therefore, resolved to remain on his own resources, with the certain loss of a year's service, trusting that on his return to England a more liberal view of his disinterested labours would be taken by the Court of Directors of the India Company.

The year 1850 and spring of 1851 were spent in the Sikkim forests, the Khasia mountains, Cachar, Chittagong, and Sunderbunds; during all this time Dr. Thomson worked indefatigably, though he suffered constantly from gastric irritation and fever. He returned to England in March 1851, in very broken health, but laden with enormous collections and botanical and geological observations. Soon after his arrival in England, he began, at his own expense, the distribution of his herbarium amongst the principal



Museums in Europe and America: while great efforts were being made by his friends, backed by a strong recommendation from the President and Council of the British Association, to induce the Court of Directors of the East India Company to grant him some aid towards this work, as well as towards publishing an account of his labours, either by allowing the time of his furlough to count as service, or otherwise; but it was all in vain. Whilst thousands were being expended by the Company on foreigners (the brothers Schlagintweit), who were actually travelling over the same ground that Thomson had explored, the utmost that could be extorted for the latter was a promise that when the first volume of the 'Flora of British India' (which he proposed to publish in conjunction with his fellow-traveller) should appear, his services should be favourably considered. Under these circumstances the work was commenced, the first volume was printed wholly at Dr. Thomson's expense, and sold at cost price. On application for the promised "consideration of his services," he was informed that the Honourable Company had bought some copies of the volume, and that nothing more was to be expected! The work, which embodied a marvellous amount of Thomson's valuable observations, especially on the morphology of Indian plants, together with a conspectus of the physical and botanical geography of every district of India, from Tibet to Cape Comorin and the Malay Peninsula, had consequently to be abandoned.

On the retirement of Dr. Falconer from the superintendence of the Botanic Gardens at Calcutta, in 1854, the appointment was given to Dr. Thomson, who held it in conjunction with that of Professor of Botany at the Calcutta Medical College. During all this second residence in India he suffered from repeated attacks of fever and aggravated dyspepsia, which obliged him to repair sometimes to the Sanatorium at Darjeeling, and at others to the sea. Finally, in 1861, he returned to England a confirmed invalid.

For the remainder of his life Dr. Thomson resided first at Kew, and subsequently at Maidstone, making, however, frequent changes for the benefit of his health. On one occasion, indeed, he again went to India for a short period, namely, on that of the eclipse of 1871, when he was employed as secretary to the Expedition, and when his knowledge of the country and languages was of the greatest use to its members.

The last few months of his life were spent in London, where he died, after protracted sufferings from malignant disease, on the 18th of April, 1878.

Dr. Thomson was elected a Fellow of the Linnean Society in 1852, of the Royal in 1855, and of the Royal Geographical in 1854. He was for twelve years an Examiner in Natural Science for the Medical Services of the Army and Navy, and, on several occasions, Examiner in Botany of the University of London and the South Kensington School of Science.

From his youth till he was disabled by disease he was remarkable for his bodily activity and powers of endurance; he was an excellent mountaineer, and a daring cragsman.

Though capable of great mental exertion, and possessed of a vast amount of singularly accurate botanical knowledge, he was ever diffident of his powers and morbidly averse to publication. At the same time he was of a most amiable disposition, and obliging to a fault, his time, substance, and stores of information being at the disposal of all comers. He was a great reader and good linguist, and, when imprisoned at Ghuznee, having no other books than a Persian Dictionary and a copy of Lyell's 'Principles of Geology,' he managed with the former and the aid of his gaoler to make himself master of Persian, varying his studies with chapters of the latter work, which, during his imprisonment, he read through *verbatim* seven times. Dr. Thomson married, in 1854, Catharine, daughter of R. C. Sconce, Esq., of Malta, who survives him. He left no family.

Major-General Sir ANDREW SCOTT WAUGH, R.E., F.R.S. Our Society has lost in this distinguished Indian officer one of its principal Members, who for a long period served on its Council, and was for four years, from 1867-70, one of its Vice-Presidents. He was the son of General Gilbert Waugh, Military Auditor-General at Madras, and was born in 1809. After a course of education at Edinburgh High School, he proceeded to Addiscombe, and there displayed so much ability and diligence that he passed through the course of studies in less than half the ordinary period, and came out first of his term, with the result of being especially recommended to the Court of Directors and, by Sir Charles Pasley, to the Chief Engineer of Bengal. He landed in India on the 25th of May, 1829, and thereupon entered upon his long career of service, which extended over a period of more than thirty years. On his arrival he was posted, as usual in the Engineer branch, for which he had been trained, to the Sappers and Miners, being afterwards promoted to the Department of Public Works, and various other special offices. In July 1832 he was appointed to the Great Trigonometrical



Survey, with which important scientific department he remained connected down to his final retirement in 1861. He had the great advantage in commencing his survey work to be under the immediate direction of that experienced and gifted geodesist, Sir George (then Colonel) Everest, who instilled into him the importance of extreme accuracy in the kind of work he was then entering upon; and it was whilst acting as astronomical assistant to his chief that he took part in the measurement of the great arc of the meridian extending from the Cape Comorin, in the extreme south of the Indian Peninsula, to Dehra Doon, at the foot of the Himalayas. In December 1834 he continued his work as assistant to the Surveyor-General, by measuring the northern base-line in Dehra Doon, an operation that extended over a year. Further operations of a similar character were carried on during the subsequent years, embracing many hundred miles of country, and with such surprising accuracy that when the result came to be tested by independent measurements the difference between them proved to be only six-thousandths of an inch per 100 feet. In short, as Major Godwin-Austen observes, it was during those years that the Indian Surveys were placed on their present footing, and the whole system was elaborated to the high pitch of excellence which has since distinguished it. Our late colleague was indeed fortunate in enjoying the esteem and confidence of such a chief as Everest, under whom he worked for a period of ten years. It was mainly owing to the high opinion the latter entertained of him, and the warm eulogium which he passed, when writing to the Court of Directors on his professional and moral qualifications, that Waugh, then only a Lieutenant of Engineers, received in 1843 the appointment of Surveyor-General and Superintendent of the Topographical Survey of India. The service subsequently rendered by him, however, amply proved the wisdom of the choice.

It was Waugh's first object on succeeding to the appointment of Surveyor-General to keep up and improve the system founded by Colonel Everest. One of the finest of the operations of the great Trigonometrical Survey was the one he immediately proceeded to carry out, called the "North Eastern Himalaya Series," connecting the northern ends of the meridional series. Waugh himself took a personal and leading part in this work, which was carried on for hundreds of miles along the deadly Terai at the base of the Himalayas, and proved fatal to many of the European officers and assistants engaged in it. It was during this survey that Mount Everest, the highest and grandest peak of the Himalaya,

and indeed of the world, was trigonometrically measured, and named by Waugh after his friend and predecessor.

The system projected by Sir George Everest was completed about 1847-8, and Colonel Waugh had then to deal with the vast territory, much of it newly acquired, that lay in Scinde, the North-West Provinces, and the Punjab. "In this area, again," says Major Godwin-Austen, "the difficulties met with were considerable, especially in the desert which the party under Captain Strange had to cross. The Chach base, near Attock, was measured in 1852-3; and here a fine officer, Logan, who had served at the measurement of every base-line since 1831, succumbed to the effects of previous exposure in the field. In 1854-55 the next base was taken in hand at Kurrachee, also under Colonel Waugh's immediate supervision; and in 1856 the Indus series was in progress, under Major J. T. Walker, the present Surveyor-General; the Mutiny breaking out much delayed this work, which was finally completed in 1860."

In 1857 Colonel Waugh was awarded, in his absence, the Patron's Gold Medal of the Society, Colonel Everest representing him on the occasion. In 1858 he was elected Fellow of the Royal Society. About this time the survey of Kashmir was commenced, a work which attracted more public attention in England than the preceding sections of the Indian Surveys, owing to the interesting nature of the country and the grandeur of its surrounding mountains. This great and important work was not completed until 1864, three years after Waugh's retirement.

Soon after his return to England in 1861, with the usual honorary rank of Major-General, Waugh received from Her Majesty the honour of Knighthood. So great was the personal regard in which he was held by his fellow-workers in the Department, that when he left India 192 members joined in presenting him, on his retirement, with a farewell address and a service of plate. He died on the 21st of February last.

Colonel T. G. MONTGOMERIE, R.E.—This eminent officer, one of our Gold Medallists, and a frequent contributor to the pages of our 'Journal' and 'Proceedings,' died on the 31st of January last, at Bath, where he had resided since his retirement from active service in 1873. He was the fourth son of the late Colonel W. E. Montgomerie, of Annick Lodge, Ayrshire, and was born on the 23rd of April, 1830. After completing his education at Addiscombe, in 1849, where he came out first of his term, carrying away the



Pollock Medal, he entered the East India Company's Service as Lieutenant in the Bengal Engineers, and departed for India in the summer of 1851. He had not been more than a year in ordinary service at the head-quarters of his corps, when he was posted to the Great Trigonometrical Survey, then under the direction of Colonel (afterwards Sir Andrew) Waugh. In this congenial sphere his abilities quickly told, and, after two or three years of detailed survey-work at Chach and Karachi, he was entrusted by his chief with the important task of conducting the survey of Kashmir, and the stupendous pile of mountains stretching thence to the borders of Tibet. For ten years he was occupied in directing operations in this arduous but interesting field; comprising an area of 70,000 square miles of rugged country, much of which was previously entirely unknown. In carrying out the measurements the stations of the survey-parties were obliged frequently to be made at altitudes of from 15,000 to 20,000 feet. Indeed, Mr. W. H. Johnson, one of the surveyors, is stated to have set up his theodolite on a peak near the Changchenmo Pass, elevated 20,866 feet above the sea. During the survey the little-known regions of Baltistan, Ladak, and the high plateaux near the Pangong Lake, were explored, and many important valleys, lofty peaks, and gigantic glaciers, made known for the first time. Papers descriptive of the new districts surveyed were communicated to this Society from time to time, and always excited the most lively interest. Among these was one by Captain Godwin-Austen, on the "Glaciers of the Mustakh Range," which gave a vivid description of the wild valleys and snow-clad ridges north of Iskardo on the Upper Indus, which he surveyed in the summers of 1860 and 1861. Another was by Mr. W. H. Johnson, recording his daring excursion beyond the boundaries to Ilchi, in Khotan, in 1865. The difficulties and privations attendant on the survey of these remote and elevated regions, and the names of the various officers employed, were noticed by Earl de Grey (now Marquis of Ripon) in his Presidential Address to the Society in May 1860. In 1864 the Kashmir Survey was completed, and in the following winter Montgomerie came home on sick leave. In May 1865 he received at the hands of Sir Roderick Murchison the Founder's Medal, in recognition of the important Geographical work he had performed. Returning to India in 1867, Captain Montgomerie gave increased attention to the subject of exploration beyond the Himalaya by trained natives, which had, previous to his visit to England,

occupied much of his time and thoughts. The employment of British officers in such a work being impracticable, owing to the political complications which might arise with barbarous Native States beyond the frontier, the training of skilled native observers for survey purposes had been seriously taken in hand; the plan being to equip these men as traders, and send them, with their sextants and compasses concealed, to make route-surveys successively in every part of the unknown region north of the mountains. A beginning was made in 1863 by the employment of Abdul Hamid on the route to Yarkand; but the greatest successes were achieved by the well-known Pundits who explored almost the whole of Southern and Western Tibet, in the years from 1865 to 1875, and brought back from their various journeys such well-kept itineraries and records of observations that Montgomerie and his successor were enabled to construct fairly accurate Maps of a vast extent of previously almost unknown country. The narratives of these explorations, illustrated by Maps reduced from those given in the official Reports of the survey, have been given in successive volumes of our 'Journal';\* and last year we crowned our approval of the eminently useful work performed by giving one of the Royal Medals of the year to Nain Singh, the so-called "original Pundit," who commenced by surveying the Upper Brahmaputra and determining the position of Lhâsa in 1865, and finished by the remarkable journey, on which he was sent by Captain H. Trotter, through Tibet from north-west to south-east, and across the Himalaya into Assam. In 1870-2 Captain Montgomerie officiated, during the absence of Colonel Walker, as Superintendent of the Great Trigonometrical Survey; but in 1873 he was compelled by ill-health again to return to England. His native air and repose from official duties seemed to have little effect in restoring him to strength, and in 1876 he was compelled to retire

\* 1. "On the Geographical Position of Yarkand," &c., vol. xxxvi.

2. "Report of a Route-Survey made by Pundit;—from Nepal to Lhâsa, and thence through the Upper Valley of the Brahmaputra to its Source," vol. xxxviii.

3. "Report of the Trans-Himalayan Explorations during 1867," vol. xxxix.

4. "Report of the Mirza's Exploration from Cabul to Kashghar," vol. xli.

5. "A Havildar's Journey through Chitral to Faizabad in 1870," vol. xlii.

6. "Narrative of an Exploration of the Namcho or Tengri Nur Lake in Great Tibet, made by a Native Explorer," vol. xlv.

7. "Journey to Shigatze in Tibet, and Return by Dingri Maidan, into Nepal in 1871, by a Native Explorer," vol. xlv.

8. "Extracts from an Explorer's Narrative of his Journey from Pitoragarh in Kumaon, *via* Jumla to Tadum and back, &c.," vol. xlv.

9. "Account of the Pundit's Journey in Great Tibet, from Leh in Ladakh to Lhâsa, and of his Return to India *via* Assam," vol. xlvii.



from the service. He occasionally appeared during these years of retirement among us, and took part in the discussions at our Evening Meetings; and in 1875 he acted as Agent of the Society and as British Commissioner at the Geographical International Congress held that year at Paris.

Professor ADOLPHE ERMAN, Gold Medallist and Honorary Corresponding Member of the Society, died at Berlin, his native place, on the 12th of July last, at the age of 71 years. He attained great eminence and celebrity for his researches in terrestrial magnetism, in carrying out which in early life he made his well-known journey round the world, publishing the general results of his travels in the work, still often quoted, entitled, '*Reise um die Erde, durch Nord Asien, und die beiden Oceane, in den Jahren 1828, 1829, und 1830.*'

The first part of his journey was made in company with the celebrated Norwegian magnetist Hansteen; with him the northern parts of Russia and Western Siberia were visited, and their magnetic phenomena investigated. But, on the termination of this joint undertaking, Erman continued his travels alone to Kamtschatka, making excursions to the Icy Sea on the north and the Wall of China on the south. Embarking at Kamtschatka, he crossed the North Pacific to Sitka, and returned to Europe *viâ* Cape Horn, touching at San Francisco in California, Tahiti, and Rio Janeiro. His researches were not exclusively confined to Magnetism, but every opportunity was taken of fixing astronomically the position of places and their elevation above the level of the sea; and valuable collections were also made of the botanical and zoological productions of the countries visited. Soon after his return to Prussia, Erman was made Professor of Physics in the University of Berlin, a post which he occupied up to the time of his death. His later years were busily employed in physical investigations and the publication of numerous treatises ranging over nearly every branch of the natural sciences, and his last work, on the magnetic phenomena of 1860, was left unfinished at his death. He received the Patron's Medal of our Society, at the hands of the President, Sir (then Mr.) Roderick Murchison, in 1843, and was elected one of our Foreign Honorary Members in the same year. An analysis of his published travels was published in vols. vi. and ix. of the '*Journal*' of the Society, and an English translation of part of the work, from the pen of Mr. Cooley, was published in London in 1848.

Rear-Admiral WILLIAM SMYTH.—This officer distinguished himself in early life by his enterprising journey across the Andes from Lima, and thence down the Ucayali and Amazons rivers to the Atlantic, and by the interesting narrative of his voyage which he published in 1836. Smyth himself relates that he was induced to undertake the journey by the accounts he heard at Lima, during the stay at Callao of H.M.S. *Samarang*, in which he then served as Lieutenant, of the possible navigability of the Amazons from the upper waters of one of its tributaries, the Pachitea, not far from Lima, down to the sea. Having obtained leave from the Commodore and promises of support from the Peruvian Government, he set out on his journey, in company of Mr. F. Lowe, of the same ship, in September 1834, reaching Pará, near the mouth of the Amazons, in 1836. The reluctance of the Indians at Pozuzu and on the Mayo branch of the Pachitea, where it was necessary to embark on the downward voyage, prevented his carrying out the original programme of his Expedition; and he was compelled to take the better known, but not much less adventurous and difficult, route of the Huallaga, a river flowing northward between the two easternmost ranges of the Andes, and joining the Amazons some 150 miles higher up than the Ucayali. The Huallaga, however, is a rocky stream, much obstructed by cataracts and rapids, and its exploration did nothing to promote the original object of Smyth's gallant undertaking; the hopes of patriotic Peruvians centring then, as they have always done, on the broad and deep Ucayali, which flows gently along the level alluvial plains east of the Andes. Smyth's journey was, however, fruitful in new Geographical information, and his Map of the Upper Amazons, founded on his own observations and surveys, was by far the most accurate and complete which had been published to that date. Admiral Smyth lived long enough to see the practicability of the route which he had attempted to explore proved by the Peruvians themselves, steamers having within the last few years ascended from the Amazons to the little Indian village on the banks of the Mayo, whence he was reluctantly compelled to retrace his steps. Soon after his return from South America, in 1836, Admiral Smyth served as First-Lieutenant of H.M.S. *Terror*, under Sir George Back, during the memorable voyage towards Repulse Bay, when the *Terror* wintered in the pack, in daily peril of destruction, and, returning across the Atlantic in a sinking state, was finally run on shore on the coast of Ireland. He was an admirable draughtsman,



and supplied the well-known sketches to illustrate Sir George Back's work. He died on the 25th of September last, having been for 40 years a Fellow of the Society.

MR. HENRY DANBY SEYMOUR.—Among the many losses which the Society has sustained during the past year, none perhaps has been more severely felt than that of Mr. H. D. Seymour, who died quite suddenly in August last, at the comparatively early age of 57. Mr. Seymour's loss has been especially felt, not only as that of an old and valued Fellow of the Society, but because he was one of the most active and efficient Members of our Council, full of information on those matters which chiefly occupy our attention, and ever ready to place his time and experience at the disposal of the Society for the transaction of its business, or in furtherance of the general interests of Geography.

Representing a junior branch of the House of Somerset, and the heir to considerable landed property in the West of England, Mr. Seymour received the standard education at Eton and Christchurch, which is bestowed on young men in his position in life, but which, however it may fit them for legislators or country gentlemen, does not usually develop a taste for scientific or observant travel. Mr. Seymour, however, had the instincts of a traveller from his birth, and no sooner, accordingly, had he finished his University course than he started for the East, where, during three years of continuous wandering, he visited many regions at that time little known to Englishmen, and collected a vast amount of information with regard to the social and political condition of the inhabitants of Western Asia, which stood him in good stead in after years. At the outset of his travels he carefully studied the position of Russia in the Crimea and on the shores of the Black Sea. Subsequently he passed a season in the Caucasus, and for some time took up his abode with the Dadian family in Mingrelia, thus gaining acquaintance with a people and a country quite beyond the range of ordinary travellers. From the Caucasus Mr. Seymour rode to Teheran: and then continued his journey through Western Persia to Baghdad; from whence, after visiting the ruins of Babylon, he turned northward, and joined Mr. Layard at Nineveh, subsequently traversing the Kurdish mountains by the difficult route of Bitlis and Van, till he recrossed the Arras to Erivan. It was on this occasion (September 1846) that he succeeded in ascending to the summit of the mountain popularly

known as Ararat, a feat which has been since not unfrequently repeated, but which at that time had never been accomplished except by Professor Parrot in 1829, and Herr Abich in 1845, and which indeed, in spite of all evidence to the contrary, the Armenians of the neighbourhood still assert to be impossible. As Mr. Seymour did not publish an account of his ascent of Ararat when it took place, his name is seldom or ever included in the list of the successful climbers of the mountain; but there can be no doubt that he did really perform this very difficult feat, a letter in pencil which he wrote from the summit being still preserved in the family, and the Russian authorities at Erivan having duly recorded his success at the time. After another year's travelling in the south of Russia, Mr. Seymour returned to England in 1847; and having succeeded to the family estates in 1849, he entered the House of Commons in 1850 as Member for the Borough of Poole, and commenced at once an active Parliamentary career. Through that career it will be unnecessary to follow him. Let it suffice to say that, holding advanced Liberal opinions, and being a ready and effective speaker, he took an active part in the debates from his first entry into the House, advocating Free-trade, Reform, and other popular measures, and being on all occasions a steady and consistent supporter of Lord Palmerston's policy. In some important matters, indeed, his public services were conspicuous. Desiring to obtain a practical knowledge of India, he visited that country in 1853-54, and took all possible pains to acquaint himself with the condition of the people. On returning to England he brought his experience to bear on many current questions of interest, and especially in reference to the system of torture which was carried on by the police authorities in Southern India, and the exposition and abolition of which was mainly due to the energy and perseverance displayed by him in bringing the subject under the notice of Parliament. Mr. Seymour, indeed, proved himself at this time so well acquainted with Indian affairs, and of so much use to the Government of the day, that in 1855 he was appointed Secretary to the Board of Control, an office which he continued to fill until Lord Palmerston's Administration fell in 1858. During his subsequent career in Parliament, which continued until 1868, Mr. Seymour exerted considerable influence in the treatment of all questions relating to the East, and—be it said to his honour—never failed to raise his voice in defence of the rights and interests of the people of India.

In an interval of his Parliamentary work, Mr. Seymour also



made an interesting journey to Fort Garry and the Red River, then rarely visited by English travellers, and thus gained a practical acquaintance with the Canadian frontier, which often enabled him to enliven discussions and contribute to our instruction, at our Evening Meetings.

It should further be noticed, that although Mr. Seymour's attention was principally directed to political affairs, his literary efforts were not inconsiderable. Having revisited the Black Sea in 1854, at the commencement of the Crimean war, and finding that public interest was greatly excited as to the History and Geography of that region, he published in 1855 an account of his earlier travels, with much additional research, under the title of '*Russia in the Black Sea and Sea of Azoff*;' and this unpretending work, which had a great success at the time, having rapidly passed through three editions, is still considered a standard authority—in fact, the best authority that we possess—on the statistics and general characters of the Russian position in that quarter. Mr. Seymour had also made considerable progress with two other works, describing his residence in the Caucasus and his tour through India, but it may be doubted if the MS. of either of these works is sufficiently advanced to admit of the volumes being published.

A further very important contribution which he made to our knowledge of the Geography of the East, was his edition of Messrs. Ferrier's '*Caravan Journeys*,' translated from the French under his superintendence, and published in 1856, with the addition of an extensive and most valuable series of notes and emendations.

Later in life Mr. Seymour amused his leisure by translating, with the approval and assistance of the author, Brugsh Bey's celebrated '*Egyptian History*.' He left this work in a very forward state, having already printed two volumes, and being occupied in correcting the proofs of the opening chapters of the third volume when he was struck down by apoplexy. The translation has been since finished, and the complete work will be very shortly published by Mr. Murray of Albemarle Street.

Mr. Danby Seymour was also well known as an art connoisseur. Having inherited a valuable collection of pictures and prints, and especially of old French enamels, and having moreover cultivated a taste for art from his earliest years by extensive study both at home and abroad, he had attained considerable celebrity in that department of knowledge. As one of the founders, too, of the Arundel Society and of the Fine Arts Club, he ever strove to

stimulate the popular taste for such studies, and the Loan Exhibition at South Kensington, which has done so much to promote the diffusion of art knowledge among the public, has been rarely without some fine specimens from Mr. H. D. Seymour's collection.

Mr. Seymour retired from Parliament in 1868, in consequence of the Borough of Poole being curtailed of one of its members, but he did not by any means lose his interest in public affairs, or indeed abandon the hope of re-entering Parliament. He contested the Borough of Shaftesbury in the Liberal interest in 1873, and although unsuccessful on that occasion, would probably have secured a seat at the next General Election. In the meantime he had been elected to a seat at the London School Board (1877), and had devoted himself with his accustomed energy to the improvement and extension of our system of popular education.

In conclusion, it may be said that Mr. Danby Seymour was a kind and genial companion, a good Geographer, a cultivated English gentleman, an able and honest politician, and a thorough hard-working friend of the people. His loss will be felt in many quarters, but nowhere more severely than at the Council Board of the Royal Geographical Society, where for so many years he shared our solitudes, and laboured hard to support and vindicate our interests.

Mr. ROBERT SWINHOE, long resident in China as Consul at various ports, was more widely known in the scientific world as a Zoologist than as a Geographer. He was, however, a meritorious observer of the general features of the various districts which his public duties required him to visit, and contributed valuable accounts of his journeys to this Society, with which he had been connected as Fellow since the year 1863. Thus, in vol. xxxiv. of the 'Journal,' appeared his notes on the Island of Formosa, including an account of his journey across the northern part of the island whilst fulfilling the duties of Vice-Consul at Taiwan-foo. In 1869, whilst Consul at Amoy, he sent us a narrative of "a Trip to Kalgan in the autumn of 1868," which was published in the 'Proceedings,' vol. xiv.; and some few months afterwards, in May, 1870, he read personally, at one of our evening meetings, a paper on the Special Mission up the Yang-tsze-Kiang, on which he was employed by my orders in 1869, at the time I had the honour of occupying the post of her Majesty's Minister in Peking. The object of this mission was to enquire into the trade of the Upper Yang-tsze, and in carrying it out he



ascended the river as far as Chung-King-foo in Se-chuen. The paper was published in vol. xl. of the 'Journal,' accompanied by an admirable map of the river, from the charts of the naval surveyors who were sent up the Yang-tsze for this purpose. Mr. Swinhoe was born at Calcutta in 1836, and went out to China as student-interpreter at the age of eighteen. He retired from the service, with constitution completely shattered, in 1874, and died on the 28th of October last.

Mr. W. S. F. MAYERS, Chinese Secretary to the British Legation at Peking, died on the 24th of March last at Shanghai of typhus fever. By the death of this accomplished Sinologist, which has occurred before he had reached the full maturity of his powers, the diplomatic service of Her Majesty has sustained a heavy loss. He was born on the 7th January, 1831, in Tasmania, where his father the Rev. M. John Mayers, the present rector of St. Peter's, Winchester, was then Colonial Chaplain. The father being subsequently appointed Consular Chaplain at Marseilles, young Mayers received the chief part of his education in that place, and became a proficient in several modern languages. He first went to China in 1859, as a Student Interpreter, and so wonderful were his linguistic gifts and acquirements, that he mastered the rudiments of the Chinese language within a few weeks of his landing. At the end of his first year's service he was appointed interpreter to the Allied Commission charged with the government of Canton, and fulfilled the duties of the post so much to the satisfaction of his superiors that, on the evacuation of the city by the allies in 1861, he was appointed to the important office of interpreter to the consulate at Canton. In the course of the succeeding years he filled various consular posts at Chinese ports, until, in 1872, he received the appointment, which he held up to his death, of Chinese Secretary of Legation at Peking. In the same year he paid a visit to England, and was a frequent visitor at the rooms of our Society. His literary activity was at the same time shown by his preparing during the summer months a valuable paper on the "Panthays of Yün-nan," which he read to the Geographical Section of the British Association, which met that year at Brighton, in the month of August. His numerous works and papers on the subjects which he made the subject of his life, were, however, better known in China than in this country. He was a frequent contributor to the periodical literature of the time, English, American and

Chinese, and some of the most important articles in the 'China Review' at Hong Kong were from his pen. Of his works, published separately, the principal are:—'The Chinese Readers' Manual,' Shanghai, 1874; 'The Treaty Ports of China' (edited in conjunction with Mr. Dennys and Lieut. Charles King, R.M.A.); 'The Anglo-Chinese Calendar Manual,' 1875; a volume 'On the Foreign Treaties with China,' Shanghai, 1875; and a work on the 'Government of China,' which he was passing through the press at the time of his death. His 'Official Report on the Famine in the northern Provinces of China' has been recently issued as a parliamentary paper, and a learned paper on the Lamaist septem in Tibet, was published in the 'Journal of the Royal Asiatic Society' for 1869. Students of Chinese in this country have reason to be for ever grateful to our deceased Associate for the great service he rendered in procuring for the British Museum one of the few existing copies of the 'Imperial Compendium of Chinese Literature' in 5020 volumes, now safely deposited in the National Library. He had been a Fellow of our Society since 1861.

SIR WILLIAM STIRLING MAXWELL, Bart., K.T., M.P.—Among the most eminent of the Fellows whom the Society has lost in the past year by death must be mentioned Sir William Stirling Maxwell, Bart., K.T., M.P., for some twenty years well known in society and in literary circles as William Stirling of Keir. He was the only son of Mr. Archibald Stirling of Keir, and was born in 1818, his mother being a daughter of Sir John Maxwell of Pollock, Bart. On the demise of that lady's brother, also Sir John Maxwell, in 1866, his lands and estates, and subsequently his title, devolved upon her son, who had already, in 1847, through the death of his father, inherited the noble estates of Keir and Cawder. William Stirling of Keir was not, however, distinguished only by a high social position, but by eminent personal accomplishments. In 1848 he published his well-known and now exceedingly costly work, it being out of print, 'Annals of the Artists of Spain,' the result of a lengthy sojourn in that country before the period of his father's decease. This highly-prized work was not, however, the first which brought its author's name before the public. He had already, in 1846, published a volume of 'Songs of the Holy Land.' His name being thus favourably known, it is not surprising that a work so pleasantly written as the 'Cloister Life of the Emperor Charles V.' for which his intimate knowledge of Spain and the



Spanish language so eminently qualified him, and which was published in 1852, should be received with the warmest acceptance and approval. A second edition was issued in the self-same year, and a third in 1853. In 1855 he published 'Velasquez and his Works,' and in 1856 'Notices of the Emperor Charles V. in 1555 and 1556, selected from the Despatches of Federigo Badoer, Ambassador from the Republic of Venice to the Court of Bruxelles.' In 1860 appeared two privately-printed works from his pen, viz., 'An Essay towards a Collection of Books relating to Proverbs, Emblems, Apophthegms, Epitaphs and Ana, being a Catalogue of those at Keir,' and 'An Essay towards a Collection of Books relating to the Arts of Design, being a Catalogue of those at Keir.' Sir William Stirling Maxwell, at a later period, gratified his æsthetic taste by bringing out various "Éditions de luxe," among which may be specially quoted his reproduction in facsimile of the anatomical plates of Vesalius, with a life of that author, printed in 1874.

It is easily to be understood how these learned labours, conjoined with his high social position, marked him out as a fit person to receive some of the highest literary distinctions which the country has to offer. In 1863 he was elected Lord Rector of St. Andrew's University, and in 1871 Lord Rector of Edinburgh University. In 1872 he was elected a Trustee of the British Museum, and in 1875 became Chancellor of the University of Glasgow. Her Majesty also conferred on Sir William, in 1876, the Knighthood of the Most Ancient and Most Noble Order of the Thistle, and he was the only person, not a peer, who of late years has had that honour bestowed on him. Sir William was M.P. for Perthshire from July 1852 to December 1868, and was re-elected in February 1874. This distinguished man became a Fellow of the Royal Geographical Society in the year 1860. He died at Venice on the 15th January of this year, surviving by only seven months his second wife, the beautiful poetess, whom we all know under the name of the Hon. Caroline Norton.

WILLIAM LONGMAN, Esq.—In August of last year died Mr. William Longman, of the eminent publishing firm of that name, which has existed for so many generations in Paternoster Row. For nearly twenty years Mr. Longman had been a Fellow of our Society. Some of the most memorable publications in English literature have been issued by the firm of "Longmans" during the eight-and-thirty years of Mr. William Longman's partnership therein. Notably,

Macaulay's 'Lays of Ancient Rome,' his 'Essays,' and his 'History,' all of them events of great magnitude in the annals of the trade; Colenso's Book on the Pentateuch; the 'Greville Memoirs,' 'Lothair,' &c. &c. Mr. Longman was, moreover, himself an author, and his subjects lay very much in the direction of the purposes of our own Society. His first production was a privately-printed volume, describing a 'Six Weeks' Tour in Switzerland,' and some three years ago he contributed "Impressions of Madeira in 1875" to 'Fraser's Magazine.' During the years 1872, 1873, and 1874 he was President of the Alpine Club, and his last contribution to literature was the commencement of some remarks on "Modern Mountaineering and the History of the Alpine Club," which appeared in the 'Alpine Journal' of February 1877, but which were not completed. He also wrote 'Suggestions for the Exploration of Iceland.' His admirable 'Lectures on English History' were primarily intended for the instruction of his neighbours at Chorley Wood, in Hertfordshire, where he had a country house, and where his genial and kindly character made him exceedingly popular.

Sir JAMSETJEE JEJEEBHoy, Bart.—Our Society has had the misfortune to lose, on the 11th of July last, one of its most distinguished members in the person of the patriotic Parsee merchant, Sir Jamsetjee Jejeebhoy, of Mazagon Castle, near the city of Bombay. In him the Parsees truly lost a leader whose personal influence amongst Europeans was exerted alike with honour to himself and advantage to his castemen. Indeed his claim to the gratitude of the poor, whether in the East or in the West, was hereditary. His father, the first baronet, who was also the first of the Queen's Indian subjects who ever received a titular honour, was the Peabody of Hindostan, and, like that great American philanthropist, both father and son distinguished themselves for ample, large-hearted, and well-directed charity. The first baronet, out of a princely fortune, expended no less than a quarter of a million sterling in the foundation, endowment, and support, of charitable and benevolent institutions in his native city and its suburbs. On receiving Her Majesty's Patent of an hereditary title, he settled the sum of a quarter of a million upon the holder of it, and the Legislative Council of India passed an act authorising each baronet, on succession to the honour, to take the name of Jamsetjee in lieu of his own name. Thus the late baronet, on his father's death, on the 14th of April, 1859, relinquished his original names



for those of his father. He became a magistrate at Bombay, and held a seat in the Presidential Legislature. No Oriental prejudice prevented him from having a deep feeling for art, and his library was adorned with some very splendid pictures. He was fond of music also; and, although not much of a sportsman himself, delighted in his stud, which he freely placed at the service of his military English friends. The chief point of interest, however, in the late baronet's career, as well as that of his father, was the unceasing effort that he made to weave fresh links between India and England, to prevent the one from supposing itself capable of ever being severed from the other, and to imbue the Indian mind with an appreciation of European manners. After a lingering illness, said to have been brought on by the shock he received by an accident to a railway train between Bombay and Delhi, this valued friend of England died at Poona at the age of sixty-six.

Sir JAMES PHILLIPS KAY SHUTTLEWORTH, Bart.—On the 26th of May last year, died at his residence, 63, Cromwell Road, Sir James P. Kay Shuttleworth, who for more than twenty years had been a Fellow of our Society. The deceased Baronet took an active part in the subjects of Sanitary Reform and Public Education, and was for some time Secretary to the Committee of Council of Education, in which post he was mainly instrumental in establishing a system of school-inspection by officers appointed by the Government. He was created a baronet on retiring from his office in 1849. In 1864 he was High Sheriff of Lancashire, of which county he was a Magistrate and Deputy-Lieutenant. Sir James had assumed the additional name of Shuttleworth by Royal licence on his marriage in 1842 with Janet, only daughter of the late Mr. Robert Shuttleworth, of Gawthorpe Hall, Lancashire. In 1870 he received the honorary degree of D.C.L. from the University of Oxford. Sir James was the reputed author of the well-known novel of 'Scarsdale,' and of a volume of 'Modern Ballads of Lancashire,' among which are several short poems in the East Lancashire dialect.

Besides the above-mentioned, the Society has lost during the year many Members of high position, or distinguished merit in other walks of life than those connected with Geography. At the head of the mournful list stands His late Majesty VICTOR EMANUEL, KING OF ITALY, one whom we were proud to associate with us as an Honorary Member, and who gave during his brilliant and successful reign many tokens of the high regard in which he held

Geography and Geographical Explorers. Our African travellers and discoverers were especially singled out for notice by him and his ministers, from the time when Speke, returning from his discovery of Victoria Nyanza, was honoured by the Gold Medal with the device "Honor est a Nilo," down to Stanley, in passing through Italy after his last memorable journey across the continent. We have lost also Lord KINNAIRD, a Member since 1867, who died on the 8th of January, at the age of seventy-one years:—Lord HENRY PERCY, brother to the present Duke of Northumberland, distinguished for his military services as officer in the Grenadier Guards, and for special gallantry in the Crimean War, who died on the 3rd of December last:—Lord SOUTHWELL, fourth peer of that name, whose death occurred, at the early age of forty-two, on the 26th of April:—Admiral the Hon. H. J. ROUS, one of our oldest Members, whose election dated from 1839, and who, although known in his later years almost solely in connection with "the Turf," had been in his time a Geographical Discoverer, inasmuch as whilst commanding H.M.S. *Rainbow* in the Australian seas, in 1824, he discovered Richmond River, north of Sydney:—Admiral GEORGE EVANS, for many years Conservator of the Mersey, who died on the 15th of March, at the advanced age of eighty-one years:—Admiral Sir CHARLES EDEN, K.C.B., one of the Lords of the Admiralty in the years 1860 to 1866, whose death occurred on the 7th of March:—Admiral the Hon. Sir F. W. GREY, G.C.B., third son of Earl Grey, the Premier under whom the Reform Bill of 1832 was passed. This eminent officer saw much service in South Africa in the years that followed the Crimean War, during which he was Naval Superintendent in the Bosphorus. He died on the 2nd of this month, at the age of seventy-two:—Sir FRANCIS GOLDSMID, Bart. (M.P. for Reading), whose lamentable death by accident at the Waterloo Railway Station on the 2nd inst. must be fresh in the minds of you all. He will be long remembered as a munificent contributor to the endowments of University College, London:—Sir WILLIAM MITCHELL, who died on the 1st of this month, whose memory will be held in remembrance for procuring the adoption, by his energy and advocacy, of the system of examination for Commanders of Merchant Vessels, and who was Editor and Proprietor for thirty years of the 'Shipping and Mercantile Gazette.' He was knighted for his exertions in the establishment of an International Code of Signals for the use of all nations:—Mr. JAMES MURRAY, who served his country well and zealously for forty-three years as clerk in the



Foreign Office, rising through the various grades to the post of Assistant Under-Secretary of State. He had been a Member of our Society for thirty-three years:—Mr. ROBERT HOLLOND, of Stanmore Hall, who represented the borough of Hastings in Parliament for fifteen years, and distinguished himself in early life (in 1836) by his memorable aerial voyage to Germany in the Nassau balloon:—Mr. J. C. MARSHMAN, whose energetic career in India—first as Baptist Missionary and afterwards as reformer of native education and founder of the weekly newspaper 'The Friend of India'—rendered his name famous throughout our Indian possessions. The death of this able man and enthusiastic philanthropist occurred on the 8th of July, 1877:—Mr. W. S. LANDSAY, the well-known merchant and shipowner, and Member of Parliament, who joined our Society in 1855. His name will be remembered hereafter for his 'History of Merchant Shipping,' an important contribution to British Maritime Annals. He died on the 28th of August last. To this list may justly be added the name of Mr. CHARLES LAMBERT, a merchant of the city of London, who bequeathed the munificent sum of 25,000*l.* to his son, Mr. J. Lambert, to be distributed in gifts to Scientific Institutions. Mr. Lambert had been a Fellow since 1864, and his son set apart 500*l.* as our Society's proportion of the bequest.

The following are also among our losses since the last Report:—Mr. C. D. Bell (Surveyor-General, Cape of Good Hope), Mr. J. H. Bainbridge, Mr. Christopher N. Bagot, Mr. J. Brown, Mr. Alfred Burton, Mr. William S. Burton, Dr. Donald Burton, Mr. Charles Brett, Mr. Henry Bond, Mr. William Carr, Mr. Richard Davis, Mr. W. G. Dick, Mr. Thomas Dix, Mr. William Falconer, Mr. Daniel Griffin, Mr. W. K. Gladstone, Mr. H. L. Hunter, Lieut.-General W. R. Haliday, Mr. Frederick W. Irby, Mr. Henry Johnson, Staff-Commander J. H. Kerr, R.N., Sir Thomas D. Lloyd, Bart., Commander T. H. Larcom, Mr. Charles Lanyon, Mr. George Loch, Mr. W. L. Lawrence, Mr. J. H. Lance, F.L.S., Mr. John Miland, Mr. Thomas Malby, Mr. W. A. Mackinnon, M.P., F.R.S., Mr. George Moffatt, Mr. A. C. Marzetti, Mr. George Mitchell, Captain D. J. Nasmyth, Mr. James Nichols, Mr. H. A. Nissen, Mr. John Peter, Mr. Thomas F. Robinson, F.L.S., Mr. Arthur E. Scott, M. Emanuel Silva, Admiral E. Saurin, Mr. John George Thompson, Colonel W. Tedlie, Mr. Edward F. Teschemacher, Captain H. Hutchinson Walshe, Mr. Edward Waller, Mr. Robert Carr Woods, Mr. T. F. W. Walker, Mr. Charles Wynne-Finch.

ADMIRALTY SURVEYS.\*—With undiminished resources the various Marine Surveys undertaken by the Admiralty are making steady progress: this will be seen by the following summary of work performed:—(1) on the shores of the United Kingdom; (2) of our Colonial possessions, and (3) of foreign countries where political relations or the interests of commerce require efficient charts for secure and active navigation.

On the shores of the United Kingdom, Staff-Captain Parsons in H.M.S. *Porcupine* has been mainly engaged in re-sounding the central part of the English Channel, extending from the neighbourhood of Dungeness and the Varne shoal to the Owers: an accurate knowledge of the depths of this area was much needed in the interests of modern navigation, the surveys of the last century being very deficient in detail. Uncompleted work in the River Humber, near Hull, and an examination of the changes at the entrance of Harwich harbour were also brought to a conclusion by this officer and his efficient staff.

During the early part of the year Staff-Commander J. H. Kerr, in a hired vessel, was engaged in the River Shannon and completed a survey of Foynes harbour; towards the close of the working season this indefatigable and skilful officer was seized by illness which speedily terminated fatally; the survey was then transferred to Staff-Commander George Stanley, and the remainder of the season was employed in completing the thorough examination of the shoal ground in the immediate neighbourhood of the Smalls and Bishops Rocks, and also of Ramsay Sound near Milford Haven.

Staff-Commander Hall and his assistant have also completed the re-survey of the upper part of the River Shannon as noted in last year's Address; this elaborate work leaves nothing to be desired by the seaman for navigation or by the engineer for improvement works.

In the Red Sea, Commander Wharton in H.M.S. *Fawn*, assisted by Staff-Commander Millard, completed the survey of the Massuah channel, and also determined the relative positions of prominent points of the Hanish islands, in relation to a light-house proposed to be established on the group.

Staff-Commander Millard, on the *Fawn* quitting the Red Sea, returned to Malta to complete the several surveys made in that ship, for official use. During the last autumn (August 1877), this

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\* By the Hydrographer, Capt. F. J. O. Evans, C.B., F.R.S.



officer, in consequence of representations as to the shoaling of the approaches to Port Said and the resulting obstruction of the fairway to the Suez Canal, entered on a close examination of the ground, this examination disproved the allegation of a special shoaling, but showed that, as compared with the previous surveys of 1870, 1875, a section from the light-house through the 26-foot bank north-west of the light-ship at the entrance, "gives the average rate of deposit at one foot per year, and not localised to particular spots, but is broad in its character, extending over the whole area comprising the approaches to Port Said." The surveying officer found that 28 feet could be carried to within the break-water on the official leading marks.

The survey of the shores of Mauritius and the bank of surrounding soundings, on the scale of one inch to the nautical mile, together with plans of Port Louis and Grand Port, have been completed by Navigating-Lieutenant Coghlan during the present year. This survey, performed with slender resources in two seasons, is to be highly commended for the fulness and precision of its details. The whole work is being prepared for speedy publication.

On the East Coast of Africa, Commander Wharton, in H.M.S. *Faen*, has during the past year resumed his old labours in a thorough survey of the intricate coast-line and outlying reefs north and south of Zanzibar. On the passage from the Red Sea he visited the Abd-el-Kuri islands, and searched, unsuccessfully as it proved, for a rock on which the British steam-ship *Hong Kong* struck in 1875. This casualty, which took place at dawn of day, and resulted in the immediate loss of twelve lives and the total disappearance of the ship, was stated to have occurred three or four miles from the western end of Abd-el-Kuri Island. Commander Wharton found no danger beyond three-quarters of a mile from the land, a very short distance outside shoal-ground charted by the old Indian surveyors.

From July 1877 to February of the present year, the *Faen* was uninterruptedly employed on the African coast, completing it from latitude 7° s. to 9° s. together with the island of Mafia and the harbour of Kilwa Kisiwari; also, northward of Zanzibar, the harbours and approaches to Tanga, Kisimaya, Manda, and Lamu. The *Faen* is now refitting at the Cape of Good Hope, and recruiting her ship's company after these arduous labours. Commander Wharton, on the passage down from Zanzibar obtained an excellent series of deep-sea soundings on the line of a projected off-shore telegraph-cable.

In China the seaboard between Hong Kong and Foochow, in relation to reported dangers affecting in-shore navigation, has been diligently examined in H.M.S. *Nassau*, by Captain R. H. Napier and an efficient staff. This duty has included a survey of Haitan straits and the channels leading thereto; of the execution of plans of Liaulu bay, Dodo passage, Amoy, Breaker point, Cupchi bay, the Middle-ground of Foochow River, Snipe island, in Wanchow River; and the rectification in position of several off-lying dangers which had at various times hazarded ships, subsequent to the publication of the preliminary surveys of 1840-46, referred to in the last Address.

H.M.S. *Sylvia*, under two new commanders in succession to Captain St. John (Captain B. W. Bax and Commander P. Aldrich), has been engaged in the past year sounding out the ship channels amongst the group of islands extending some 20 leagues seaward of the south-west part of the Korea, and lying in the direct line of communication between Japan and the northern ports of China; examining the positions of the Kosiki and other off-lying islands westward of the southern part of Kiusiu, Japan; and making a survey of the coast between Omai-saki and Irako-saki on the south coast of Nipon. All these surveys are very useful for the increasing commercial intercourse with Japan.

The Surveying Service, in the prosecution of this work, has lost an efficient and excellent officer. Captain Bax, favourably known for his spirited account of service in these waters and in the Eastern Archipelago ('Narrative of the Voyage of H.M.S. *Dwarf*, 1875'), after a few months' command of the *Sylvia*, quickly succumbed to an attack of illness, his constitution having been apparently weakened from long service in the East.

In Newfoundland the survey of Placentia Bay and the development of its manifold and irregular banks and shoals, has occupied Staff-Commander Maxwell and his party for a greater part of the past working season. The remainder of the time at disposal was devoted to a preliminary examination and triangulation of Notre Dame Bay and a survey of the coast-line in the immediate neighbourhood of the mines now being worked on its shores. Discoveries of copper still continue to be made at various localities in the bay, and the increasing importance of this region well warrants the marine survey now undertaken.

In Jamaica the surveying party under Lieutenant Pullen has during the past year completed the coast-line to the westward of



Black river as far as St. John point, including the off-lying bank of soundings; together with large scale plans of Blewfields and Savanna-la-Mer. The resources of this survey have been strengthened by the purchase of the efficient schooner yacht *Sparrow-hawk*.

The Admiralty surveys in progress in the several provinces of Western Australia, South Australia, Victoria, and Queensland are steadily being pressed forward: South Australia and Victoria are approaching completion, and within four or five years South Australia will be well charted.

In Western Australia, Staff-Commander Archdeacon and his party have triangulated and charted in detail the coast-line from West Cape Howe to Haul-off Rock—a station about 50 miles to the eastward of King George Sound. An elaborate plan of this Sound and its inner harbour (Princess Royal) has also been completed.

In South Australia, the party under Staff-Commander Howard has been partly engaged in making extended plans of small ports and anchorages in newly-opened districts in Spencer Gulf, and otherwise in completing the surveys of Denial and Smoky bays, situated near the western boundary of the province.

In Victoria, aided by the Government steam-vessel of the province, Staff-Commander H. J. Stanley has extended the survey from Banks strait, referred to in last year's Address, to Flinders Island, and included the many off-lying dangers in the neighbourhood. This is a valuable addition to the hydrography of Bass Strait.

In Queensland, Navigating-Lieutenant Connor (during the absence on leave of Staff-Commander Bedwell) has been chiefly engaged in sounding the numerous channels and shoals off the coast between West Hill and Cape Palmerston, and making extended tidal observations in Broad Sound.

Lieutenant G. E. Richards, a surveying officer attached to the Commodore's ship in Australia, has completed an elaborate survey of the entrances into Port Jackson on either side of the well-known Sow and Pigs shoal. Extensive dredging-operations in the eastern of these entrances, undertaken by the Colonial Government to render access by the heaviest draught ships to the noble harbour of Sydney, give an immediate value to this marine survey. This young officer has also completed a survey of Elizabeth reef, one of the marked outlying dangers of the Colony, and at which a life-boat with a liberal supply of provisions and water is moored in a secure reef-lagoon, for the relief of shipwrecked mariners.

Steady progress is being made in the marine survey of the Fiji

Islands by Lieutenant W. U. Moore, in H.M. schooner *Alacrity*. The whole of the southern coast of Viti Levu, with its off-lying islets and reefs; and Kandavu passage, the main approach to Savu Harbour (the site of the new capital), are now completed.

During the past year, the Hydrographic Department has issued 167 'Notices to Mariners'; and 33 'Hydrographical Notices' have been published, containing 217 pages 8vo.

In addition to the usual 'Tide and Light Lists' one new work, 'The Newfoundland Pilot,' has been published; and revised editions of four volumes of sailing directions issued, viz.: The South and East Coasts of Ireland ('Ireland, Part 1'). Directions from Calais to the Skaw ('North Sea Pilot, Part 4'). Directions for the South and South-West Coasts of England ('Channel Pilot, Part 1'). Directions for approaching the China Sea by way of the Cape of Good Hope as well as by Malacca Strait ('China Sea Directory,' vol. i.).

Apart from the hydrographic information derived from the officers of Her Majesty's Navy on active service in nearly all parts of the globe, valuable material has been received from other sources; notably, on the mouth and outer banks of the River Indus, by Lieut. A. W. Stiffe, late Indian Navy; on the coasts of China and Japan, by W. G. Anderson, commanding S. Ship *Conquest*; and by Mr. J. C. Pendred, of the Japanese Government S. Ship *Thabor*.

The new charts and plans published amount to 54, and 1940 charts have undergone correction; 182,000 charts have been printed for Her Majesty's service and for the use of the general public.

ARCTIC REGIONS.—Although there is an evident lull in Arctic enterprise in this country since the return of the *Alert* and *Discovery*, considerable activity is being displayed in various quarters abroad. In the United States, Captain Howgate, who has advocated for some time past a scheme for reaching the Pole by establishing first a Polar colony as a base of operations, seems now in a fair way to see his project carried out. It is expected, indeed, that an Expedition, supported by a grant of 50,000 dollars by the United States' Government, will be despatched for the purpose during the present summer; a Bill to that effect having met with a favourable hearing by a Congressional Committee. The plan is first to found a colony of American seamen in the sheltered quarters of Lady Franklin Bay—i. e. as near the Pole as possible;



and thus inure the party to the rigours of Arctic life, so as to be fully prepared when a favourable season occurs to make a push for the Pole. A private American Expedition, at the cost of Mr. Gordon Bennett, is also talked of as about to attempt to reach the Pole this summer by way of the Spitzbergen seas. But the attention of the scientific public has been chiefly drawn to the bold undertaking that has been for some time preparing in Sweden, under the direction of the well-known savant and Arctic explorer, Professor Nordenskiöld. The object of this new Swedish expedition is no less than the solution of the problem, now three centuries old, of the North-East Passage. A steamer, specially constructed for ice-navigation, manned by officers and sailors of the Swedish marine, and provisioned for two years, will leave Sweden about the beginning of July, and make for the Kara Sea by way of Matotschkin Strait in Nova Zembla. The mouth of the Yenisei is expected to be reached by the middle of August, and, after touching at a trading station here, the voyage is to be continued towards Cape Cheljuskin, the most northerly point of Asia. This is the only promontory along the coast which has not yet been passed by a ship, and this crucial difficulty being overcome, Professor Nordenskiöld anticipates a successful run thence to Behring Straits. Equipped as the Expedition will be with all the resources of modern science, and directed by a veteran Arctic voyager like Nordenskiöld, who has already made three voyages *viâ* Nova Zembla and the Kara Sea to the Yenisei, besides various expeditions to Spitzbergen, it must be conceded that there are here good grounds for anticipating a successful issue. It is true that all previous attempts, including the last one, on an important scale, viz. the Austro-Hungarian Expedition under Weyprecht and Payer, have utterly failed to force the ice which collects at critical points on the route, or to stem the adverse currents; but Professor Nordenskiöld believes it can be done by a steamer, and in one season too, and we are bound to respect the opinion of a man of such extensive Arctic experience. The Expedition, we should add, is fitted out mainly at the expense of Mr. Oscar Dickson, the well-known public-spirited merchant of Gothenburg, who has previously contributed so largely to the cost of similar undertakings. The King of Sweden also bears part of the expenses.

A revival of interest in Arctic matters has this year been witnessed in Holland, where a public subscription has been raised to equip a vessel for a six months' cruise to Jan Mayen Land and

Nova Zembla. Associations and Committees were formed in most of the large towns, and sufficient funds obtained for the Expedition without having recourse to foreign aid, or even to the Dutch Government. The appeal to the public was made on patriotic grounds, the avowed purpose being the erection of some unpretending granite monuments in Nova Zembla over the graves of William Barents and his comrades, the glorious Dutch navigators of the seventeenth century, who perished here in the winters of 1633-34 and 1634-35. But the mission of the little sailing ship, appropriately named the *Willem Barents*, is not intended to be thus limited in its objects. It is stated that the Expedition is to be "an Arctic school for Dutch seamen," and hopes are expressed that it may prove to be but the preliminary to other and more important enterprises. After erecting the monuments to the old explorers, the *Willem Barents* will push on as far as possible towards the north-west from the coast of Nova Zembla; continuing as long as the sea remains open, and returning to Holland before the winter. The Expedition set sail from the mouth of the new Amsterdam Canal on the 6th of the present month.

In my last Address I alluded to the enterprise in which Captain Wiggins has been for some years past zealously engaged, together with German, Swedish, and Russian explorers, viz. the opening up of a commercial route by sea to the mouths of those great Siberian rivers, the Obi and Yenisei. Since then we have had the pleasure of listening to a lecture in this hall by Mr. Seebohm, the companion of Captain Wiggins, when he returned by land to the Yenisei, in April 1877, who gave us a most instructive account of the Physical Geography and products of this great region, accompanied by graphic descriptions of the river scenery, the breaking up of the ice, and the desolate Tundras in their summer dress. Captain Wiggins' ship was unfortunately wrecked at the mouth of the Yenisei; but a schooner built upon the river, which Mr. Seebohm purchased, was afterwards navigated by a Russian crew round Norway to the Baltic.

*TURKISTAN: Russian Explorations.\**—The attention of Russia during the past year has been too much absorbed by war to allow of much progress being made in the peaceful work of geographical inquiry. The pages of her contemporary literature do not therefore contain much information regarding expeditions on foot or in preparation.

\* By E. Delmar Morgan.



One of the most interesting journeys lately accomplished in the regions bordering the Russian possessions in Asia is that of the Hungarian Professor, M. de Ujfalvy, to whom I referred in my last Anniversary Address, and who has since returned from his expedition, undertaken for purely scientific purposes. Furnished with letters of introduction from the French Minister of Public Instruction to General Kaufmann and the Russian authorities, M. de Ujfalvy, accompanied by his wife, rode through Ferghana, visiting its chief cities and studying the ethnology of the various races inhabiting it. Ferghana is chiefly known to us through the writings of the late M. Fedchenko. Since he visited it, however, in 1871, important political events have taken place, and the whole of Kokand has finally been placed under Russian dominion. Entering the valley from the west, M. Ujfalvy followed the high road leading from Khojend to Kokand, passing Makhran, the scene of a battle between the Russians and Kokandians, and Bish-Aryk, where the aspect of the scenery changes from the stony desert to the well-cultivated fields. Kokand "the agreeable" is, in our traveller's opinion, the most interesting city of Central Asia. This was the capital of Khudoyar, the last of the independent Khans, and his palace is the finest of its kind. Here, too, are some richly-decorated schools and mosques and a spacious and animated bazaar. In this city, numbering from 60,000 to 70,000 inhabitants, the Russians live peaceably; and the Sarts, forming the trading class in this as in all the other cities of Central Asia, are contented to have exchanged the personal rule of the Khans or Begs for the wise and enlightened administration of their new masters. The Russians have adopted Marghilan as the capital of their new possessions, Kokand having been found unhealthy, and producing goitres. Although one of the oldest towns \* of Ferghana, Marghilan cannot be compared with Kokand in the architectural designs of its buildings, or in the animation of its streets or public places. This is the centre of the silk industry, and the foundations of the new Russian town are springing up near the Sart town. The most picturesque point of Ferghana is Vadil, near the entrance to the valley of Shah-i-mardan, one of the seven reputed burial-places of Ali. Not far from here is Kutban-kul, re-named by M. de Ujfalvy, in honour of the distinguished traveller, "Lake Fedchenko." It contains trout, and its water is agreeable to the

\* Its antiquity, however, is not as great as Osh, which is said to date from Alexander the Great's time.

taste. Ush-Kurgan was the next place visited. This was the last stronghold of the insurgents in the insurrection of 1876, of which Professor Vámbéry has given us some account.\* It is situated in the valley of the Isfairam, a tributary of the Syr-daria, and commands the best pass into the high up-lands of Alai. M. de Ujfalvy also visited Osh, disposed amphitheatre-like round Mount Takhti Soliman (Solomon's Throne); Andijan, noted for its fertility and mineral wealth; the country between it and Namangan, on the opposite side of the Syr, being termed the *Ek-souarasi*, or Paradise of Kokand. At Namangan, Russian buildings are springing up from the ruins of the Kokandian habitations recently destroyed. At Kassan some remains of historical interest were discovered. This town is inhabited exclusively by Tadjiks, who describe themselves to be the earliest settled inhabitants of the country; that is to say, prior to the Arab invasion. For further details of these interesting travels, as well as for an account of M. de Ujfalvy's journey into Kulja, which, by the way, Russia does not intend to restore to China, if report speaks true, I must refer to the 'Bulletins' of the Paris Geographical Society, where full particulars on the ethnology and archæology of this country will be found.

The Russian Topographical Department has quite recently published a new map of Turkistan, in which are embodied the results of the last Russian surveys on the Alai Plateau. On this map, as I learn from the 'Geographical Magazine,' the Russian frontier-line has been advanced southwards so as to include the Great Kara-Kul Lake, to a point about 80 miles distant from its previous position. Further to the north-east, in the region of Kulja and Lake Issik-Kul, scientific researches have been undertaken during the course of last year by Dr. Regel, of the Imperial Botanical Gardens of St. Petersburg. It may be remembered that our Honorary Corresponding Member Baron Osten-Sacken was among the first to study the botany of the mountainous country between Issik-Kul and Kashgar; and to those who have studied his 'Flora Thian-shanica,' these new explorations of "the Russian Hooker" will be doubly welcome.† Dr. Regel extended his journeys to the region lying south and south-east of the Issik-Kul, almost to the confines of Kashgaria. He visited Kara-Kol, the well-known Musart Pass and glacier, and the lofty syrts or plateaux in which are situated

\* See 'Geographical Magazine,' 1876.

† For particulars, see Dr. Regel's letters published in 'Gartenflora.'



the springs which feed the head-waters of the Naryn, or upper Syr-daria.

As a further result of the Amu-daria Expedition, an interesting Memoir has appeared on the 'Hydrography of the Lower Oxus,' by Dr. Carl Schmidt and F. Dohrandt.\* In this are given the different levels of this river at every season of the year, the volume of its stream above and below Khiva, the variations in its course, the quantity and quality of its sedimentary deposits. The tables accompanying it enable us to form a tolerably accurate idea of the quantity of water diverted into canals for the irrigation of the Khanat of Khiva; and the extraordinary fertility of this oasis is explained by the fact that the Amu-daria contains all the fertilising properties of that of the Nile.

Of still greater importance to Geographers are the astronomical observations by F. Dohrandt, fixing the most important points in the delta of the Oxus. These establish in some cases a difference of nearly half a degree of longitude as compared with Solimani's results, upon which the map used during the Khiva campaign in 1873 was mainly based. Thus, while the longitude of Nukus remains unaltered, and Petro Alexandrofsk, Khiva, and Khodjeili, are only a few minutes out of their proper positions, Kushkanatau is 27 minutes, Ak-Kala 28, Chimbai 25, and Klich-Kala 17 minutes too far to the east, according to Dohrandt. The absolute longitude of Nukus was found by chronometer to be 3 hours 58.3 minutes east of Greenwich, and the values of the respective places are reckoned accordingly. For these I must refer to Petermann's 'Mittheilungen,'† from which I have borrowed the above particulars. A further survey of the Amu-daria is stated to have been made last autumn, when the Russian steamer *Samarkand* ascended the river as far as Charjui on the Bokhara frontier. To those interested in the ethnology of Russia I can recommend the perusal of an essay on this subject published in the fifty-fourth *Ergänzungsheft* of the 'Mittheilungen,' from the pen of Dr. Petermann, based on Rittich's large-scale ethnographic map, to which I called your attention in a previous Address.

The work of levelling across Siberia, begun in 1875 and continued in 1876, was finally completed last year by Müller, who is also engaged, as I learn from the 'Academy,' on the preparation of

\* 'Mémoires de l'Académie Impériale des Sciences de Saint Pétersbourg,' VII. série, Tome xxv. No. 3.

† 24 Band, 1878.

a popular description of the scenes of travel passed through by the Expedition to Olonek under his late lamented chief, Chekanoffsky, whose valuable work has found an able editor in the Academician F. B. Schmidt, and will, it is expected, shortly appear.

Amongst recent Russian geographical works, we have to welcome the appearance of four new parts of the magnificent work recording the results of the late M. Fedchenko's 'Travels in Central Asia,' edited by his widow. Originally undertaken by the Society of Naturalists in Moscow, this work has been continued under Imperial patronage, and both for its scientific matter and its illustrations may claim rank amongst the best of the kind produced in Western Europe.

MONGOLIA.—The most important Geographical event in Central Asia, and indeed one of the most important Explorations of the year in any part of the world, has been the recent journey of Colonel Prejevalsky, from Kulja to the mythical Lob-Nor and the previously unknown mountain range of Altyn-Tag beyond it. This traveller had already gained a high reputation by his previous journey through Eastern Mongolia, and along the north-western boundaries of China Proper; his most interesting narrative of which appeared in an English translation from the pen of our associate, Mr. E. Delmar Morgan, with a preface and notes by Colonel Yule in 1876. His new journey of Exploration commenced at Kulja in August 1876. With a few Cossack attendants and a Kirghiz interpreter, mounted on camels and horses, he struck across the Tian-Shan range to the south-east, and crossing the two branches of the Yuldus, soon entered the great desert of Gobi, across which the party pursued their toilsome march of some 150 miles, generally near the banks of the Tarim, until they tracked this great river to its termination in the far-famed Lake. The desert around Lob-Nor was found to consist of either barren salt, containing clay, or shifting sand, and was pronounced to be the poorest and most desolate region the traveller had ever set eyes on. Westward a vast expanse of country, consisting of sand-hills, extends as far as Kiria, and eastward a similar desert, under the name of Kum-Tag, continues to Sha-chow. The bed of the Lake extends south, east and west, as an ill-defined expanse of salt-marshes, gradually changing into sandy desert. Strange to say, its water is sweet, but it is choked up with reeds, and is a little better than a morass. Its length is about 65 miles, and its breadth 12.



Some 30 miles south of this Central Basin, which lies 2200 feet above the sea-level, runs a magnificent range of snow-capped mountains, the Altyn-Tag. The range is visible several marches to the northward, rising as an enormous wall 13,000 to 14,000 feet high. Prejevalsky and his party travelled for some distance eastward along its northern slopes, reaching Chaglyk-bulak, at an altitude of 9300 feet, before they found it necessary to retrace their steps. This range forms a magnificent feature in the geography of Central Asia, and its discovery is undoubtedly of the highest geographical importance, as it forms, in all probability, the northern escarpment of the Tibetan plateau, and gives us for the first time a definite idea of the configuration of this vast interior region. The natives report that the Altyn-Tag extends to the south-westward, without a break, to Keria and Khotan—of its eastward extension they have no knowledge. Ultimately Prejevalsky was compelled to return invalided to Kulja, and we have learnt that it is doubtful if he will be able to return and complete his magnificent discoveries.

The remarkable exploration of which I have just given a brief account, omitting all the zoological and botanical results, which form so essential a part of Colonel Prejevalsky's work as a traveller, forms a welcome continuation eastward of the geographical knowledge which our own explorers, Hayward, Shaw, and the members of Sir Douglas Forsyth's Expedition, Trotter, Gordon, and Biddulph, have gained for us during the last decade in the same region further to the west. At our last Evening Meeting, the admirable description given by Captain Trotter of the mountain ranges and lofty plateaus which shut in, on the north, west, and south, this marvellous central basin of Chinese Tartary, will be fresh in the minds of you all; and I am sure we sympathised with the disappointment which Sir Douglas Forsyth then expressed, on behalf of his party, at the refusal of the Amir of Kashgar to allow his Expedition to proceed eastward, on the very track to Lob-Nor which has now been so successfully followed up by the accomplished Russian traveller.

CHINA.—A journey of great extent, undertaken with a due regard to modern scientific requirements, has recently been made through the Western Provinces of China, Eastern Tibet, and Burmah, by our associate, Capt. W. J. Gill, of the Royal Engineers. This gentleman had previously distinguished himself by an exploration, undertaken like the present one, from pure love of scientific travel, through the

mountainous country of Northern Persia, bordering on Turkomania, and had brought back material which enabled him to construct an excellent map of the region. Being in the enjoyment of leisure and abundant private means, he next turned his attention to China and Tibet. Starting from Shanghai in January 1877, he proceeded up the Yang-tsze to the province of Se-chuen, and struck across this remote part of China northwardly, to the Tibetan frontier. Then, having traversed the northern part of the province in various directions, he crossed into Tibet, reaching Bathang, from which place, continuing southwards, like Cooper in 1869, *viâ* Atentze, he passed with better fortune than that traveller to Tali-fu, in Yunnan; travelling thence by the long and rugged mountain paths westwardly into Burmah, past the town where Margary was murdered, to Bhamo on the Irrawaddy. Throughout his journey Capt. Gill paid great attention to hypsometrical observations; and in doing so he could scarcely have rendered a better service to the geography of the generally elevated regions which he traversed; our knowledge of the vertical configuration of Western China and Tibet being most imperfect. He was fortunate enough to bring back his instruments in safety, and have them re-tested at Kew Observatory; so that we have now for the first time the means of constructing with considerable accuracy profile sections of some of the most important lines of country in this part of Asia. The paper with which he favoured us on the subject of this exploration, and which contains an admirable description of the country and people of Se-chuen and other regions visited, will be published in the next volume of the 'Journal.'

Another important addition, this year, to our knowledge of the Physical Geography of Central and Western China is Mr. Baber's official Report "On the Route followed by Mr. Grosvenor's Mission between Tali-fu and Momein." The journey of Mr. Grosvenor from Hankow to Burmah, undertaken for the purpose of inquiring into the circumstances of Mr. Margary's death, was carried out in the spring months of 1876, but it is only recently that the present Report, illustrated by a valuable set of lithographed route-maps, has been published by the Government. Throughout the section to which the maps of the Report refer—*i.e.* from Yunnan-fu to Momein—the journey was made on foot, and observations for latitude taken, whenever practicable, by meridional altitude, in pairs north and south. These serve to check the measurements by dead reckoning, and, with the addition of very numerous hypso-



metrical observations, have enabled Mr. Baber to construct a map on a large scale, filled in with topographical detail, of the highest possible interest to Geographers. A vivid idea of the nature of the country traversed is conveyed by these route-maps, on which, for a distance of nearly 400 miles, the difficult road along which the Mission plodded rarely descended lower than 5000 feet above the sea-level, and in many parts reached nearly 9000 feet. The text of the Report is remarkable for its graphic descriptions of scenery and people, and for the scholarly annotations of Marco Polo which it contains; rarely has an official document been produced so light and racy in style as this. Its practical deductions seem to be carefully drawn, and may be summarized as being entirely unfavourable to the views of those who believe in the possibility of a trade-route on a large scale between Burmah and Western China *viâ* Momein and Yunnan-fu.

BURMAH.—The death, by assassination, of Mr. T. T. Cooper, British Resident at Bhamo, news of which sad event we have recently received by telegraph, has caused profound concern amongst the many friends of this distinguished traveller. His journey through China, *viâ* the Yang-tze and Ta-tsien-loo to Tibet, as recorded in his popular book, 'Travels of a Pioneer of Commerce,' published in 1871, was a bold undertaking which stamped him a man of enterprise, formed of the stuff of which great travellers are made. On returning to England, he read a paper at our evening meeting of March 27, 1871, on the subject of the Chinese Province of Yunnan, which gave rise to an interesting discussion, in which Major Sladen, Mr. Michie, and others well acquainted with Western China and Burmah took part. He subsequently went to India, and endeavoured to penetrate from Assam to Yunnan through the Mishmi country. Of this journey he published an account under the title of 'The Mishmee Hills, 1873.' He was sent out to Burmah in 1872, to accompany the Mahomedan envoys from Yunnan, on their return to their native country after their fruitless mission to England, and was soon after appointed Resident at Bhamo—a post which he subsequently vacated through ill-health, but to which he was re-appointed in 1877. Details of his unfortunate and untimely death have not yet reached this country; all that is known is that he was killed by his own sepoy guards, one of the latter, who remained faithful, falling with him. He had retired from the membership of the Society some months previously.

INDIAN SURVEYS.\*—Besides those eminent officers, General Sir Andrew S. Waugh and Colonel Montgomerie, whose services have been noticed in our Obituary record, the Indian Survey Department has lost during the past year another veteran surveyor, Colonel D. G. Robinson, R.E., who was not, however, a member of this Society. Colonel Robinson's name is inseparably connected with one of the earliest and best executed surveys of the Department, namely, that of the hilly and intricate region between the Jhelum and Indus, embracing an area of more than 10,000 square miles. This survey occupied some eight years in execution, and the resulting map is one of the most beautiful ever executed in India. Colonel Robinson's connection with the Indian Surveys ceased some years ago, on his appointment to the important post of Director-General of Telegraphs in India, a post which he most worthily filled up to the day of his death.

The unsparing hand of death has not only fallen on these veteran surveyors, but one of the youngest and most promising members of the Department has been struck down in the execution of his duty. Lieutenant J. E. Gibbs, R.E., was attacked with cholera while at his work in the Ahmedabad district, encamped far from medical assistance of any kind. Unconscious of his critical position, he would not allow his servants to send for the nearest doctor, nor even to inform a friend who was encamped only a few miles off. Colonel Walker, R.E., the Superintendent of the Great Trigonometrical Survey, writes of him that, "though the youngest, he was one of the finest and most valuable of the officers of this Department. Gifted with rare abilities, and with the capacity of turning these abilities to good advantage; full of ardour in the prosecution of his own work, and most willing and anxious to assist others in every way, his death is as much to be regretted in the interests of the public service, and more particularly of this Department, where he was so highly appreciated, as it is mourned in the circle of his family and friends." The Annual Reports of the Great Trigonometrical Survey since 1873-74 contain many valuable papers from this young officer's pen.

In addition to the losses during the year by death of these four distinguished officers who have been so intimately connected with Indian Surveys, the Department has cause to regret the retirement, after a long and honourable career in its service, of Major-General

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\* I am indebted to Capt. H. Trotter, R.E., for this portion of the Address.



H. L. Thuillier, R.A., C.S.I., who joined the Survey Department more than forty years ago, and has held the superintendence of the Revenue Surveys under the Government of India for no less than thirty-one years; while he has occupied for seventeen years the important post of Surveyor-General of India, an office in which he succeeded the late Sir Andrew Waugh. In the last Annual Report submitted by General Thuillier to the Government of India, the late Surveyor-General points with just pride to the aggregate output of the combined Topographical and Revenue Surveys since 1845, which has for the most part been accomplished during his own administration. 493,293 square miles have been mapped by the Revenue Survey, the village lands mostly on the scale of 4 inches to the mile, and the thinly-inhabited hilly tracts on the scale of 1 inch to the mile. The Topographical Surveys since 1860 have executed 291,354 miles of survey, mostly on the 1-inch scale; and during recent years 12,281 square miles have been mapped on the large scale of 32, or 16 inches to the mile. The three give a total of no less than 796,928 square miles, or fully one-half of British India, the latest estimated area of which is 1,473,415 square miles. To those who know the style of work turned out by the Indian Survey (numerous specimens of which may be seen in our Map-Room), it appears marvellous that so much can have been done under the administration of one man, and we trust that the Government will not fail to give some adequate recognition of its appreciation of his merits, and of his long-continued and successful services.

Another officer well known to the Royal Geographical Society as an able and accomplished surveyor and explorer—I allude to Major Godwin-Austen—has also retired from the Indian Service during the past year. His good services in the Kashmir and Ladak Survey, and subsequently in Bhutan, Manipur, and along the Eastern frontier and Assam, entitle him to the gratitude of all Geographers. Both General Thuillier and Major Godwin-Austen have been members of this Society since 1859, and we cordially welcome them on their return to the old country after such long and arduous services.

But although the old names are gradually disappearing, there is, fortunately, no lack of able men to occupy the places the former have so worthily held. On the retirement of General Thuillier the Government have amalgamated the three departments, the Great Trigonometrical, the Topographical, and the Revenue

Surveys of India, and have placed the whole under the new Surveyor-General, Colonel J. T. Walker, R.E., C.B., F.R.S., who has, ever since the retirement of Sir Andrew Waugh in 1861, so ably superintended the Great Trigonometrical Survey, the most scientific of the three departments.

The new Surveyor-General, in a recently-published order, points out that the circumstances which originally led to the formation of the Great Trigonometrical, the Revenue, and the Topographical Surveys as separate departments, acting quite independently of each other, have for a long time past been gradually changing. The great Triangulation has been approaching completion, and for many years a large proportion of the surveyors and higher officers of the Great Trigonometrical Survey have been employed in Topographical Surveying on various scales; both the small, which are required for preliminary survey and reconnaissance, and the large, which are needed for elaborate and detailed survey. The Topographical Department, though originally intended for the execution of the Primary General Survey of India, has also now to undertake surveys on large as well as on small scales. The Revenue Department, which was originally intended for surveying the rich British Districts in the plains of India, leaving the delineation of all hilly country and difficult country generally to the Topographical, has for some years past been largely employed in the topography of hill districts on a trigonometrical basis. Thus the duties of the three departments have become gradually intermixed, and they are daily becoming more so, so that of very much of the work now in progress it is a matter of indifference to which of the three branches of the Department, as originally constituted, the officer deputed to undertake it may belong. The amalgamation now being carried out will enable any officer to be freely transferred from one post or survey party to another, so that he may be employed wherever his services are most required, irrespectively of the branch of the Department to which he was originally appointed.

The amalgamation thus accomplished was obviously desirable in the interests of the public service, and the Government of India are fortunate in having an officer of Colonel Walker's calibre to superintend the working of the Department.

For the last time, then, we proceed to make our annual review on the work performed by the Surveys of India as separate departments.



1. *The Great Trigonometrical Survey*.—Colonel Walker's General Report of the Great Trigonometrical Survey operations for 1876-7,\* recently received in this country, is of unusual interest, as, in addition to the progress reports of the ordinary routine operations of the Department, there are many interesting details about the various special scientific inquiries undertaken by the Trigonometrical Survey.

Of these latter the most interesting in their results are perhaps the *Geodetic operations* carried out under the superintendence of Major W. M. Campbell, R.E., and Captain W. J. Heaviside, R.E.; the amplitudes of three arcs of parallel, between Trigonometrical Stations in Southern India, were determined by the electro-telegraphic method; thus completing differential determinations of longitude on eleven arcs between points in Southern India which had already been connected together by the great triangulation.

Some interesting results have been elicited from the comparisons of the electro-telegraphic measurements with those obtained trigonometrically, the trigonometrical values being in almost all cases greater than the telegraphic. This, as Colonel Walker explains, is partly due to the circumstance that the constants for the figure of the Earth, which always have been and are still used in the computation of the geodetic latitudes and longitudes of the Indian Survey, are not quite exact; the most modern and exact investigation of the figure, that by Colonel Clarke, C.B., R.E., of the Ordnance Survey, shows that the differences of longitude corresponding to the trigonometrical distances between points in Southern India should be diminished by about  $\frac{1}{5500}$ th part of their magnitudes; a portion also of the excess of the trigonometrical values is due to local deflections of the plumb-line at the stations of observation, and is in accordance with the results of Captain Basevi's pendulum observations, which indicate a probably greater density in the strata of the earth's crust under the beds of oceans than of continents; from this cause the plumb-line at stations on the coast would be deflected from the continent towards the ocean, and this would diminish all astronomically-determined arcs between stations on the coast and those in the interior, and still more diminish the arcs between stations on opposite coasts of the continent.

On the completion of the operations in Southern India, Major

\* Printed at the office of the Superintendent of Government Printing, Calcutta, 1878.

Campbell and Captain Heaviside proceeded to determine the differences of longitude between Bombay, Aden, and Suez, in order to complete the connection between England and India, of which the section from Greenwich to Suez had already been executed on the occasion of the transit of Venus in 1874, under instructions from the English Astronomer-Royal. Colonel Walker now gives the final longitudes determined for India:—

	R.	M.	S.	
The Station at Aden	= 2	59	55.89	} E. of Greenwich.
The Observatory at Bombay	= 4	51	15.88	
The Observatory at Madras	= 5	20	59.42	

The longitudes of all places in India are usually referred to Greenwich through the Madras Observatory, the position of which has been determined at various times by astronomical observations. The latest determination of that nature is 5 h. 20 m. 57.3 s. =  $80^{\circ} 14' 19.5''$  east of Greenwich, which has for many years been the accepted value, and is given in the current 'Nautical Almanacs;' this value is thus shown to be 2.12 seconds of time, or 31.8 seconds of arc, in defect of what may now be considered to be most probably the true value; or, as Major Campbell puts it, "the effect of the season's operations is to remove India, theoretically, about 2000 feet further from England."

Progress has also been made during the past year by Major Herschel, R.E., with the prosecution of the reduction of the pendulum observations made in former years by the late Captain Basevi, R.E., and by Captain Heaviside, with the object of ascertaining the varying attraction in different latitudes and at different heights, but with the somewhat unsatisfactory result, to use Major Herschel's own words, "that the force of gravity (including in that term the attraction of the whole matter of the earth wheresoever situated) as evidenced by the pendulum—remains not wholly explicable by any *known* conditions of the earth's form or constitution. Neither do the observed anomalies point with any certainty to an inference having a high degree of likelihood." Major Herschel points out that pendulum results are subject to errors which we have no prospect of eliminating, and that therefore their *accuracy of observation* should be regulated with regard to the *magnitude* of those errors, and their *frequency of locality* increased both locally and widely; locally, in order to extend our knowledge of the measure of this natural error or uncertainty; widely, in view of the fact that, at present, measures of gravity are the



only kind of measure of a geodetic character which can be extended with any approach to generality over the whole globe.

*Tidal Observations.*—Colonel Walker gives an interesting chapter on the analysis of the observations taken by Capt. A. W. Baird, R.E., in former years in the Gulf of Cutch, on the West Coast of India. These were reduced by Captain Baird in London, with the assistance and co-operation of Mr. Roberts, of the 'Nautical Almanac' office. Elaborate calculations have been made with the object of determining the influence of variations in barometric pressure, and in the velocity and direction of the wind on the sea-level; but the results obtained are at present only considered to be approximate. Important results may be anticipated from a systematic record of tidal observations at selected points on the coast of India, which the Governor of India is about to inaugurate. The scientific results to be expected from the record has been provided for by the appointment of Captain Baird, an officer in every way qualified for the post, to supervise and control the local observations, and to arrange for their utilisation to the utmost extent possible.

*Trans-Himalayan Exploration.*—During the year 1876, the *Mullah*, one of the Geographical Indian Survey band of explorers, made a survey of the course of the Indus, from the point where it enters the plain above Attock, to the point where it is joined by the River Gilghit—a distance of some 220 miles—no part of which is distant so much as 40 miles from our own frontier, but which has hitherto successfully defied all attempts at survey. Starting from the Gilghit River at an altitude of about 5000 feet, the Indus winds its way tortuously through great mountain-ranges, whose peaks are rarely less than 15,000 feet in height, and culminate in the Nanga Parbat, a well-known mountain with a height of 26,620 feet. The river in many places is hemmed in so closely by these great ranges that its valley is but a deep-cut, narrow gorge, and as a rule there is more of open space and cultivable land in the lateral valleys, nestling between the spurs of the surrounding ranges, than in the principal valley itself. The Indus emerges into the plains of the Punjab at 1200 feet above sea-level.

Colonel Walker reports:—"The positions and heights of all the most commanding peaks in this region had been long fixed by Captain Carter's observations at trigonometrical stations on the British frontier-line; but no European has ever yet penetrated into

it.\* Very difficult of access from all quarters, it is inhabited by a number of hill-tribes, each independent and suspicious of the other, who are in a great measure separated and protected from each other by natural barriers and fastnesses. As a whole, the region has never been brought into subjection by any of the surrounding powers. Each community elects its own ruler, and has little intercourse with its neighbours; and with the outer world it only communicates through the medium of a few individuals who have the privilege of travelling over the country as traders. The Mullah possesses this privilege, and thus, in the double capacity of trader and explorer, he traversed along the Indus, and through some of the lateral valleys, leaving the others for exploration hereafter.

"This work done, he proceeded, in accordance with his instructions, to Yassin, marching through the Gilghit Valley, but not surveying it, because the labours of the lamented Hayward, who was murdered at Yassin, have already furnished us with a good map of that region. From Yassin he surveyed the southern route to Mastuj through the Ghizar and Sar Laspur Valleys. This has furnished an important rectification of a route which had hitherto been laid down from conjecture only, and very erroneously; for the road, instead of proceeding in a tolerably straight direction from Yassin to Mastuj, as was supposed, turns suddenly from south-west to north-east at Sar Laspur, which is situated at some distance to the south of the direct line, in a valley lying parallel to the Valley of Chitral. At Mastuj the Mullah struck on to his old survey of the route from Jelalabad, *via* Dir and Chitral, to Sarhadd-i-Wakhan, in 1873, and then proceeded along that route towards the Baroghil Pass, as far as the junction of the Gazan with the Yarkhun River, and then along the northern road from Mastuj to Yassin. This road turns up the Gazan Valley, crosses the Tui or Moshabar Pass—which is conjectured to be probably not less than 16,000 feet in height—and, after traversing a deep crevassed glacier for a distance of about 8 miles, reaches the point where the Tui River issues in great volume from the glacier; the road then follows the course of the river down to its junction with the Warchagam River, a few miles above Yassin.

"Returning to Sar Laspur, the Mullah next surveyed the route

\* Several itineraries which were obtained from native information are published in Dr. Leitner's 'Dardistan,' and they have been combined together, with considerable ingenuity and very tolerable success, by Mr. Ravenstein, in a map published in the 'Geographical Magazine' for August 1875.



to the south-west, up the valley leading to the Tal Pass. This pass is situated on a plateau of the range which connects the mountains on the western boundary of the Valley of the Indus with those on the eastern boundary of the Valley of Chitral, and is generally known by the people of the country as the Kohistan. The sources and most of the principal affluents of the Swat and the Panjkora rivers take their rise in this region, all the most commanding peaks of which were fixed by Captain Carter's triangulation; but of the general lie of the valleys relatively to the peaks, nothing at all definite has been known hitherto. The Mullah has done much to elucidate the geography of this region. On crossing the Tal Plateau he descended into the Panjkora Valley, and traversed its entire length down to Dodbah, at the junction of the Dir River with the Panjkora, where he again struck on his route-survey of 1873.

"It would have been well if he could then have gone down the Panjkora to its junction with the Swat River, but circumstances prevented him from doing so. He therefore travelled along the Havildar's route of 1868 as far as Miankalai, and then surveyed the road to Nawagai and on to Pashat in the Valley of Kunar; and finally, returning to Nawagai, he surveyed the road from there down to the British fort of Abazai.

"Thus the explorations of the Mullah have added much to our knowledge of the geography of the interesting regions lying beyond our northern Trans-Indus Frontier. A good deal, however, still remains to be done before our knowledge of these regions is as full and complete as it should be, and every effort will be made to carry out further explorations as soon as possible."

Accompanying the Report is a sketch-map illustrating the Mullah's explorations, which makes a most valuable addition to our maps of Northern India. A good reduction of this map is given in the 'Geographical Magazine' for May 1878.

Much valuable Trans-Himalayan exploration has also been performed by Mr. E. C. Ryall, who, while in charge of the *Kumaon and Garhwal Survey*, succeeded in crossing the frontier of Chinese Tibet, and by tact and good management was enabled to spend twenty-four days in Hundes, a district lying to the north of Kumaon and Garhwal. During this time Mr. Ryall made good use of his instruments, and laid down with his theodolite the position of numerous distant peaks. His stations of observations, sixteen in number, averaged 17,800 feet in height, one of them being

only a little short of 19,600 feet. Colonel Walker gives us hope that the additional geographical information thus acquired may form the subject of a future Trans-Himalayan Report from the pen of Mr. Ryall.

The operations of the past year have completed the topographical survey of Kumaon and Garhwal, which is a matter of much congratulation. The work latterly has been unusually severe, from the extreme elevation of the country surveyed. Mr. Pocock executed one plane-table section at an average elevation of 16,500 feet, one of the points where he set up his plane-table being 19,000 feet.

Further explorations beyond our frontier were carried out by Lieutenant H. J. Harman, R.E., in the Assam Valley. This officer, accompanied by an escort of 100 men, visited two hill-peaks in the Abar country, and was able to obtain topographical sketches of about 100 square miles of plain country and 300 square miles of hills hitherto unsurveyed. After returning from the Abar country, Lieutenant Harman continued his *secondary triangulation* in the *Assam Valley*, extending for a distance of 53 miles along the banks of the Brahmaputra River to within a few miles of Sudiya. The sides had to be made short in order to minimise the difficulties of line-cutting. The country was very difficult; incessant rains for days not only flooded the nullahs and turned the forest-paths into streams of mud and water, but brought out myriads of leeches; while cane-jungles formed almost insuperable obstacles to laden elephants and bare-legged natives. Lieutenant Harman met magnificent specimens of rubber-trees, and on one of them a station was formed at a height of 112 feet above the ground to connect his triangulation with that of Lieutenant Woodthorpe, R.E., who was carrying on a topographical survey in the neighbourhood. Lieut. Harman was laid up during the season with a slight sunstroke, and towards the end of the season was thoroughly knocked up, and became very ill. Various programmes for further geographical explorations in the hitherto unexplored regions bordering on the Upper Assam Valley have received the sanction of the Government of India; and are, we believe, now in progress of being carried out.

*Triangulations in Burmah.*—The operations are here carried on in a most difficult country, the hills being flat-topped, densely wooded, and without any characteristic features to distinguish one from another. Many of the surveyors, including Mr. W. G. Beverley—



in charge of the party—suffered severely from illness, and the out-turn of work in consequence falls short of the average.

*Eastern Frontier Series, Moulmein.*—This triangulation, carried out under the superintendence of Messrs. Rossenrode and H. Beverley, has now reached Tavoy on the parallel of Bangkok, the capital of Siam; and a chain of triangles of little more than 100 miles in length will suffice to connect that important city with the triangulation of India. The distance from Tavoy to Bangkok by sea being over 2000 miles, Colonel Walker points out the value of a direct trigonometrical connection to check or rectify the Marine Surveys which have been carried along the coast-line. The Government of Siam has therefore been invited to allow of the execution of the proposed chain of triangles.

*Eastern Sind Series, Meridian 70°.*—This series, under the superintendence of Captain Rogers, R.E., has been carried forward a distance of 125 miles over an area of 2455 square miles, and has been prepared for a distance of 98 miles in advance of the final operations. The country is a desert, composed for the most part of parallel ridges of sand of considerable height and with steep slopes covered with thick thorn-jungle. Captain Rogers describes the curious formations known as “*Draens*,” which occur in this district. These are tracts of many miles in extent where the regular sand-hills disappear, and give place to a variously moulded surface of continually shifting sand, utterly devoid of vegetation. These *draens* are seldom crossed by the natives, and a distance of 5 miles is sufficient for a fatiguing march. Wells are found in small patches of hard soil in the midst of these wastes of sand. In these wells the water is invariably good, although everywhere else it is scarcely drinkable. In one district of about 30 by 40 miles there was a complete absence of drinkable water.

*Madras Coast Series.*—This triangulation was carried on under the able superintendence of Captain T. T. Carter, R.E., and made good progress in spite of the unfavourable nature of the country, which is flat and contains innumerable groves of valuable trees, and of the famine which was raging in Southern India, and made it extremely difficult to arrange for supplies. Endeavours were made to identify and connect the marks of Colonel Lambton's triangulation in 1800, but unfortunately only one of these could be

found. In the modern surveys care is now always taken to point out and transfer to the local authorities for protection of all marks and stones which it is desirable should be kept for future record or use. In the Madras triangulation, under Captain Carter, special precautions have been taken—such as buying and enclosing the small plot of ground containing the Survey Station, wherever it was practicable to do so.

*Topographical Survey of Kattywar.*—This survey has, as usual, made good progress under Major Ayrton Pullan. In Western Kattywar 1700 square miles have been surveyed on the scale of one mile to an inch; 2062 square miles have been triangulated in advance, and 752 linear miles of boundary have been traversed with theodolite and chain. Colonel Walker states that the out-turn of work of all kinds, both in the field and during the recess, is very creditable to Major Pullan, who was well seconded as usual by Mr. J. McGill.

Steps will be taken during the field-season, which is now progressing, to extend the triangulation into Cutch, with the view of commencing the topographical survey of that province.

*Topographical Survey of Guzerat.*—This survey has been carried on under the orders of Lieutenant-Colonel Haig, R.E., and for a short time under Lieutenant Gibbs, R.E., whose death from cholera on the 21st of November last has been already alluded to. The out-turn of work of all description has been very satisfactory. An area of 1988 square miles was surveyed topographically on the scale of 2 inches to the mile, the British districts in minute detail for publication on the same scale, the Native States in less detail for publication on the 1-inch scale. An area of 2200 square miles has been triangulated and traversed in advance for future topography.

*Levelling operations in Guzerat.*—These were carried on by Mr. T. H. Rendell, acting under instructions drawn up by Capt. Baird, who was absent in Europe. Mr. Rendell levelled over 358 miles on the usual rigorous system of the Department, *i.e.* with the observers working independently, and checking each other, station by station. Of this, 183 miles was a part of the main line between the Gulf of Cutch and Bombay. The remainder was distributed in branch lines connecting important places *en route*. The heights of 306 permanent bench-marks were determined, several of which were points of the railway and the irrigation systems of levelling, which



have thus been connected together and referred to the same datum as that of the Survey Department.

*Computations.*—The final reduction of the north-eastern quadrilateral, that section of the Great Triangulation which includes all the principal chains of triangles situated to the north of a line running from Sironj in Central India, through Calcutta to the Eastern Frontier, and to the east of the meridian of Sironj, was commenced in season 1875–76, under Major Herschel, R.E., and has been completed during 1876–77, under Mr. J. B. Hennessey, M.A. Much good work has also been done in the drawing, printing, and photo-zincographic offices, under the able superintendence of Messrs. Hennessey and W. H. Cole.

2. *The Topographical Surveys of India.*—Under the immediate superintendence of General Thuillier, these have been making the usual rapid and satisfactory progress. Seven parties have been working in Northern India, and two in Mysore. The total out-turn of topographical survey, mostly on scale of 1 inch = 1 mile, amounts to 18,909 square miles, while 22,119 square miles have been triangulated preparatory to detailed survey; and the fair mapping of 20,237 square miles has been completed by the several parties.

Any one interested in the progress of the Indian Surveys should study a map specially prepared by the late Surveyor-General, and which accompanies his Report\* for 1876–77, now under review, and which admirably shows at a glance the progress of the Imperial Surveys up to the present time. Many interesting details will also be found in the report of the work performed by the various surveys during General Thuillier's tenure of office.

*The Gwalior and Central Indian Survey* made good progress under Captain C. Strahan, R.E., 1568 square miles of country having been mapped on the 1-inch scale; in addition to which large-scale maps were made of the Fortress of Gwalior (24 inches to the mile), and the cantonments of Morar. The country embraced in the season's operations was divided into two by the watershed of India, which here runs north-west and south-east. The north-east portion is described as flat and open, with several large towns and villages, and fairly well cultivated. It forms part of the plateau of Raj-

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\* General Report on the Topographical Survey of India, and of the Surveyor-General's Department for Season 1876–77. By Major-Gen. Thuillier, C.S.I., F.R.S., &c., Surveyor-General of India. Calcutta, 1878.

pútana, and is on an average about 1600 feet above the sea. The change after crossing the watershed is very abrupt. Instead of a fine, open, undulating, and almost level country, the whole surface is intersected by watercourses, which gradually become deeper and deeper, at last forming narrow valleys enclosed by hills, varying from 100 to 500 feet above them. The fall of the country is considerable, as much as 40 or 50 feet per mile. Interesting details about the aboriginal tribes of this region are given in Captain Strahan's Report.

*Khandesh and Bombay Native States Topographical Survey.*—This party, under the direction of Mr. H. Horst, was divided into two detachments, one being employed on the ordinary 1-inch scale in the native hilly States north of the Nerbudda, and the other on the 2-inch survey of the revenue-paying portions of the plains of Khandesh. The former, of which 1030 square miles was surveyed during the season, includes a wild and hilly tract between the Vindhya Range and the Nerbudda River, the latter (811 square miles) extended along both banks of the Tapti River, between the meridians of 75° and 76°.

*Central Provinces and Vizagapatam Agency Survey.*—This survey has been brought to a completion during the past season under the orders of Captain Holdich, R.E. No less than 3225 square miles of the north-western portion of the native State of Bustar were topographically surveyed on the reduced scale of 2 miles to the inch. The country was extremely wild, difficult, and unhealthy, and the work was only completed at the cost of much hardship and suffering to all the members of the party.

The area completed by this party since its first formation in the Ganjam and Vizagapatam Agencies of the Madras Presidency, the Orissa Tributary States of Bengal, and in Sambalpur, Raipur, Biláspur, and Bustar, amount to no less than 72,144 square miles. An interesting and well-written account of the district surveyed during the past season is given by Mr. J. A. May.

*North-East Division Central Provinces Survey.*—The operations of this survey were also brought to a close during the past year under the management of Lieutenant-Colonel Depree, who states in his Report that during the twenty-two years of its existence, the No. 4 Topographical Party had triangulated and mapped, on a scale of 1 inch to 1 mile, a tract of country extending from the high-water



mark of the Bay of Bengal at Balasore to a point 9 miles east of Jubbulpore. This tract extends for  $9^{\circ}$  of longitude, and, on an average, for  $2^{\circ}$  of latitude, and its area aggregates nearly 52,000 square miles.

General Thuillier records his high appreciation of Lieutenant-Colonel Depree's industry, zeal, and ability in connection with this survey.

*Bhopal and Malwa Survey.*—This survey has made excellent progress under the direction of Capt. J. R. Wilmer, 2968 square miles having been finally surveyed and mapped on the 1-inch scale, while the area triangulated in advance of the detail work covers 2864 square miles. Much of the topography, owing to heavy forest, could only be obtained by chain and plane-table traversing, of which 1200 linear miles were completed. Since 1871 this party has surveyed 16,098 square miles, and there yet remains for survey an estimated area of 18,738 square miles. Some details of the country surveyed—through which the forest-covered Vindhya Range passes—are given in reports by Capt. Wilmer and his assistant, Lieut. Gore, R.E.

*Rajputana Survey.*—This survey is being carried over the Native States of Marwar, Shekawati, and Bickaneer, under the able and zealous direction of Lieut. E. P. Leach, R.E.

*Mysore Topographical Survey.*—Two parties were engaged in this recently commenced survey of Mysore, under the orders of Capt. Geo. Strahan, R.E., and Capt. M'Cullagh, R.E.; one in the Nundydroog and the other in Nagar Division. The Nundydroog party triangulated over an area of 5280 square miles, and completed 1465 square miles of topography—a result considered by General Thuillier to be very satisfactory, considering the adverse circumstances under which they laboured. The Nagar division triangulated 4311 square miles, and topographically surveyed 861 square miles. At one time nearly three-fourths of the establishment was on the sick-list. It was originally hoped that the survey of the whole of Mysore, which has an area of 24,881 square miles, might be completed in five years; but owing to the financial pressure caused by the famine, establishments have been reduced to about one-half of the original strength, and with the present establishment, it is doubtful whether the undertaking will be accomplished in twelve years from the time of commencement.

*Khásia, Gáro and, Nágá Hills Survey.*—This party has for several years been employed in Frontier Surveys and Explorations, and was this year divided into three distinct detachments; Major Badgley, the officer in charge, was employed in making revisions and additions to former mapping in the vicinity of Shillong; two assistants were employed on a boundary survey of the Khásia-Gáro, and Kámrup districts; while Lieut. Woodthorpe and Mr. Ogle were employed in exploring and mapping the wild and hitherto unexamined portion of the Lakhimpur district, s.e. of the military outpost of Sadiya, and s. of the Brahmaputra River. Arrangements have been made for further explorations by Lieut. Woodthorpe in conjunction with Lieut. Harman, of the Great Trigonometrical Survey, who has been mostly employed in the main triangulation of the Brahmaputra River. They are to explore, triangulate, and map the country on the n.e. of the Lakhimpur district, in the vicinity of the Subansiri River, and also subsequently between the Dihang River and the Brahmakund. This expedition will, it is hoped, add materially to our knowledge of the northern frontiers of Assam and Tibet, which have, as Gen. Thuillier points out, been on three occasions successfully entered by Major H. H. Godwin-Austen; first in 1863 with the Bhutan Mission, when he completed the greater portion of Western Bhutan; in 1864, when he surveyed and mapped 2000 square miles of the Bhutan Duars; and in 1874-75, when, assisted by Messrs. Harman and Ogle, he mapped 2375 square miles of the Daphla Hills, and was the first to define the course of the Subansiri River.

Gen. Thuillier points out, in connection with these recent geographical explorations, that the question of the course of the Great River of Tibet, the Nari Chu, Sangpu, or Brahmaputra, and its channel through the hills into the Valley of Assam, which was for so long a subject of keen discussion between European geographers, is likely to be revived; as Major Godwin-Austen is of opinion that the eastern branch of the Subansiri River, near longitude  $94^{\circ}$ , will prove to be the Great River of Tibet, which hitherto has been supposed to enter Assam north-west of Sadiya, through the Dihang River.

Gen. Thuillier writes in the highest terms of praise of Major Badgley and Lieut. Woodthorpe, the latter of whom has now, for the third time, been specially selected for survey expeditions beyond the British Frontier. Lieut. Woodthorpe gives a very



interesting report on the Naga Hills\* and Lakhimpur Expedition Survey, to which we must refer our hearers for details. The country surveyed was chiefly in the vicinity of the Noa Dihing River, one of the southern tributaries of the Brahmaputra.

It is abundantly evident that the obstacles to be overcome in such work are not inconsiderable. In one place, a range of hills is described as "nearly level along the top, with no commanding points anywhere; it is sinuous, and covered everywhere with tall forest trees, filled in with tangled undergrowth of bamboo and canes, through which we cut at the rate of 300 yards an hour." And again, in another place: "The survey of the river was difficult, as in many places it was too deep for wading and the banks were impracticable at those parts, and we had to resort to rafts in some places where long deep pools lay between precipitous rocky banks, along which, before we constructed rafts, it took us three hours to make a quarter of a mile of way.

*Revenue Surveys of India.*—The Report on the Revenue Surveys for 1876-77 has unfortunately not yet been received in this country.

ARMENIA: *Mount Ararat.*—The ascent of this famous peak in September 1876, by Mr. J. Bryce, D.C.L., and his account of it in the 'Alpine Journal' for May 1877, have given occasion to a well-timed article in the same periodical by Mr. Douglas W. Freshfield, summarizing all previous ascents of the mountain. These prove to have been more numerous than was supposed, several of those who had accomplished the feat of reaching the summit having published no record of the exploit. One of the most curious circumstances connected with these ascents is the confident disbelief in them all expressed by the Kurds and Armenians who dwell at the foot of Ararat; and Mr. Bryce, in the account he gave us of his journey at one of our recent Meetings, informed us that this incredulity extended even to Russian men of science, who for many years refused to believe in the success of their own countryman, Parrot, in 1829, to whom the honour is now generally accorded of being the first who ever reached the top of Ararat. It is scarcely to be wondered at, therefore, that the positive statements of Kurdish elders and people to Major Stuart and the party of English officers who ascended Ararat in 1856, should have been believed by those

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\* Published as an Appendix to the Surveyor-General's Report.

gentlemen, one of whom, Major A. J. Fraser, in a letter quoted by Mr. Freshfield, in the article above referred to, says, "I succeeded in reaching the top of Ararat, as did all the party on that or a subsequent day, being the first persons who have done so since the days of Noah." The narrative of Major Stuart, published in vol. xxi. (p. 77) of our 'Proceedings,' gives an account of this ascent in further detail, and states frankly the grounds of the belief of the party that no one had reached the summit before them. Among the successful ascents prior to that of Major Stuart's party, the most important in a scientific point of view was that of Herr Abich, the eminent geologist, in 1845. After two repulses, as he himself records, and being once forced to spend the night buried in the snow at a height of 13,000 feet, he finally reached the top on the 29th of July of that year. It is unfortunate that the fanatical scepticism of the natives should have had the ulterior effect of throwing discredit on the statements of eminent men of science like Herr Abich and others, whom all the world now believes to have really attained the summit.

*Beloochistan.*—The little-known district of Bashakurd, in the western part of Beloochistan and bordering on Persia, was visited in 1876 by our enterprising young Associate, Mr. E. A. Floyer, during a few weeks' sick leave, whilst engaged in the Persian Gulf Telegraph operations. His paper and map are published in the just-issued volume of the Society's 'Journal,' and form a welcome addition to our knowledge of this part of Asia, following the survey work and the publications of Sir Frederick Goldsmid and Majors St. John and Lovett. Subsequent to this interesting excursion Mr. Floyer made a long journey from Jask to Kirman, Yezd, and Ispahan; and in mid-winter rode from the last-mentioned place across the mountains to Bagdad, surveying the whole route and making observations with the thermometer at 20° below zero. He is now Director of Telegraphs to the Khedive of Egypt.

*New Guinea.*—A further addition to our scanty knowledge of the interior of New Guinea has been made this year by Mr. Andrew Goldie, a botanical collector, who, as described in a letter to Lord Glasgow, published in a recent number of our 'Proceedings,' succeeded in November last in penetrating some 60 miles inland from the mission-station at Port Moresby. Mr. Octavius Stone had previously made an excursion in the same region, a little to the



east of Mr. Goldie's track, but he attained only half the distance of the later traveller. Mr. Goldie crossed the Lalokie River a little below its junction with a tributary, named the *Goldie*, coming from the slopes of the Owen Stanley range to the north-east. Near the coast the country is barren and stony, but further in the interior a number of hills, with sharp ridge-like summits and richly-wooded slopes, become a prevailing feature; and at the furthest point reached the party marched over undulating expanses of rich grassy prairie, varied with woods. Like Signor D'Albertis in his journey up the Fly River the year previous, Mr. Goldie was struck with the paucity of inhabitants in the central parts, and it seems to be no longer doubtful that the interior of this large and picturesque island is thinly peopled. During the journey traces of gold were discovered on the River Goldie, and the tracks of a large animal, which the natives who accompanied the party seemed to regard with great terror. According to Mr. Goldie, the foot-prints were similar to those made by horses' hoofs with shoes on, but with the addition of four toes. In reading this we are reminded of the similar account brought home by Captain Moresby, and the explanation by Signor D'Albertis, to the effect that the tracks are those of the cassowary.

Signor D'Albertis, the indefatigable Italian naturalist and traveller, has made another long voyage up the Fly River during the year. Engaging a small steamer called the *Neva*, and a crew composed of Chinese and South Sea Islanders, he crossed Torres' Strait and entered the mouth of the river on the 21st of May of last year. His voyage was undertaken almost exclusively for the purpose of making Zoological and Botanical collections, Geographical exploration being only a secondary object; his Report, therefore, which appears in the columns of the Australian newspapers, contains but little new information about the river and the neighbouring country. He discovered, however, a large tributary entering the Fly from the north-east. His journey on the river, which continued from May to the end of October, was, from first to last, a series of disasters. Scarcely anything in the annals of travel is more painful to read than his published diary, which is filled with details of troubles with his ill-assorted and unmanageable crew, and with accounts of repeated combats with the courageous savages of the river-banks. The Papuans seem to have been hostile throughout, in the interior as well as near the mouth; and as D'Albertis was afraid of entrusting guns for their defence to his ill-conditioned

and mutinous crew, he had to defend himself with his own rifle, at times against hundreds of the enemy, who advanced in the most determined manner in their canoes, and poured showers of poisoned arrows into the vessel. The crew at length deserted him, first one-half and then the other. The steamer frequently ran aground, and was once attacked by the natives, whilst high and dry upon a sand-bank.

To crown all, D'Albertis first, and then the engineer, fell ill, and the traveller had for some days to drive the engine. Finally the undaunted naturalist had to re-cross Torres' Straits without assistants, except the engineer and a New Caledonian boy. Notwithstanding its painful incidents, it appears the journey was tolerably successful in its main object, a large collection of interesting species having been made far in the interior of New Guinea.

The Rev. W. G. Lawes, the able and zealous member of the London Missionary Society, of whose influence among the natives Mr. Goldie speaks in most favourable terms, has recently returned to England. It is to be hoped that the stores of knowledge regarding the tribes and languages of this part of New Guinea which this gentleman has gathered together during his three years' sojourn will be ere long communicated to the world.

*North America.*—The survey operations undertaken by various official departments of the United States, to which I alluded, in my last Address, as conspicuous for their breadth of view in the investigation and publication of scientific material of all kinds, have been continued with undiminished energy, and commensurate results.

The first of these undertakings, under the charge of Professor F. V. Hayden (whom we now number among our Honorary Corresponding Members), having completed the survey of Colorado, has extended its operations to Wyoming and Utah territories. The area covered is about 30,000 square miles, between the 107th and 112th meridians, and extending northwards to  $44^{\circ} 15'$  N. lat. Besides meeting with the usual difficulties attending scientific explorers, operations had from time to time to be suspended, owing to the threatened danger from hostile Indians. Special importance is likely to be attached to this season's work, as, in addition to Dr. Asa Gray, Professor Leidy, Mr. S. H. Scudder, and other distinguished American scientific men, our countryman Sir Joseph



D. Hooker, President of the Royal Society, and General Strachey, accompanied the Expeditionary party on different occasions; so that a more than usually valuable result is to be expected, when the observations of such competent authorities are given to the world.

It has already been noted that the discovery of still existing glaciers in the Wind River Mountains would not be surprising, as remains of huge ancient glaciers were found, and indications of a cessation of their action within a comparatively recent time. No range of mountains in the United States appears to have such accumulated masses of snow as these. Along the western side of the Rocky Mountains in the northern part of the survey, outflows of lava were found to have taken place on a very large scale, great sections of Idaho territory being covered with sheets of basalt that have been poured out in very recent geological times. These and other indications appear to show that the region traversed, however rich in scientific facts (not the least of which is the discovery of a miocene deposit unusually rich in fossil *Articulata*), is not likely to prove of much importance in Political Geography, owing to the desolate and irreclaimable character of the land.

In addition to the field-work of the year, Professor Hayden has published four more thick 4to. volumes, illustrated; a Report of 827 pages, profusely illustrated with maps, sections, views, &c.; the completion of the second volume, and the whole of the third of the Bulletin; and various miscellaneous publications. In these, besides pure geography, the kindred sciences of ethnology, zoology, and palæontology, are ably treated by authorities in these sciences.

Major J. Powell's Survey of the Rocky Mountain Region has been continued in the central portion of Eastern Utah for about 16,000 square miles, between  $38^{\circ}$  and  $40^{\circ} 30'$  n. lat., and  $109^{\circ} 30'$  and  $112^{\circ}$  w. long. The portion explored is an arid and inaccessible plateau, intersected by cañons and gorges. The hypsometric work effected has been found of great importance in the classification of lands and in agricultural industries, on account of the knowledge obtained as to the capability of the various streams being utilised for irrigation. It has also been found that the inflowing water of the Great Salt Lake is one-tenth part greater than formerly; and geological evidence shows that the system of movements by which the mountain ranges of Utah and Nevada were produced have been continued to the present time. Two quarto volumes have

been published by this Survey, discussing the geology and ethnology, the latter of especial value and interest.

Lieutenant G. M. Wheeler (now also one of our Honorary Corresponding Members), of the Engineer Department, U. S. Army, in continuation of his surveys west of the 100th meridian, has triangulated some 12,000 square miles further in Colorado, besides exploring various portions of California, Utah, Idaho, Montana, and New Mexico. Great numbers of valuable magnetic, geological, and meteorological observations have been made by his parties; and the Fellows of the Society have had an opportunity of hearing an account of part of the work done (in New Mexico) from the lips of our countryman, Mr. Goad, a scientific officer attached to Lieutenant Wheeler's party. The chief interest of this Survey lies perhaps in its reference to mining; but amongst other incidental results is a series of sheets, now in preparation, showing the extent of arable, grazing, timber, and other lands, with the direction of drainage, basin perimeters, amounts of rainfall, &c.

Other operations, such as those by Captain W. S. Stanton in the Platte and Captain E. H. Ruffner in the district of the head-waters of the Red River of Texas, may be mentioned; and the publication of two further quarto volumes of the scientific results of Mr. Clarence King's survey of the 40th parallel, of which the field-work was long ago finished, deserves record.

The Survey of the great Lakes and of the Mississippi, under General A. A. Humphreys, has extended its reconnaissances to the west of Lake Erie, with the view of connecting it by triangulation with Lake Michigan. Many soundings and water-level observations have been taken, showing that the mean surface of Lake Superior is 20.5 feet above that of Lake Michigan, and 602 feet above mean tide at New York. The operations on the Mississippi have had a conspicuous effect in the further improvement of the mouth of that river.

The Coast Survey, under the direction of the Treasury, has prosecuted its work with great energy, embracing chains of triangulation on the Atlantic coast from Mount Desert to Cape Canaveral; an extension in Maine and from Cape Florida to the delta of the Mississippi, with deep-sea soundings and temperature observations in the Gulf of Mexico; the determination of heights in the Alleghanies and Blue Ridge Mountains; and a material progress in the survey of Southern California, the Oregon Coast, the Columbia River, and Puget Sound on the Pacific coast. The occupation of



Mount Diablo and Mount Helena, two peaks of the coast range, as westernmost stations of the great trans-continental chain, has cleared at once the interval between that range and the Sierras, with a diagonal of 162 miles, a great step towards the grand scheme of uniting the Atlantic and Pacific triangulations.

CENTRAL AMERICA.—Projects for the canalization of the isthmus connecting North and South America have of late years attracted but little attention in this country, although it was here that those popular discussions of the subject took place, which led to the disastrous survey expeditions of Mr. Lionel Gisborne and others in the years between 1850 and 1857, a record of which will be found in the volumes of our 'Journal' of those dates. In the United States and France, and in the republics whose territory is concerned in the schemes, the subject has never wholly dropped out of sight, and many successive expeditions, national and private, have been engaged in surveying track after track amid the dense forests, in the endeavour to find a practicable route for an inter-oceanic canal. The last of these Expeditions, organised in Paris under the patronage of M. de Lesseps, and commanded by Lieutenant Lucien Wyse of the French Navy, returned last autumn. Its object was to discover a route for a canal, without locks or tunnels, through the southern part of the Isthmus of Darien, where Commander Selfridge, in one of the United States Expeditions a few years previously, had found the most promising ground. Starting in November 1876, the numerous party, having something of an international character, penetrated by way of the Paya River (on the Pacific side), crossing the watershed and entering the basin of the Atrato (on the Atlantic side) by way of the small River Cacarica. It was in this rather circuitous direction that the lowest depression between the two oceans was believed to exist; but Lieutenant Wyse failed to find any saddle in the dividing range lower than 450 feet above the lowest tides. The party subsequently turned northward and explored the valley of the Chuquaque, here discovering a low pass, between the River Tiati and Port Gandi, which he believed to be the best line for a canal. But the surveys were incomplete.

SOUTH AMERICA.—Mr. C. Barrington Brown, formerly Geological Surveyor of British Guiana, whose interesting description of the Kaieteur Falls of that country, and the marvellous region in which

they are situated, was published in the 41st volume of our 'Journal,' has since given to the world a general account of his journeys in the interior of the colony, under the title of 'Canoe and Camp Life in British Guiana.' He has also published, in conjunction with his colleague, Mr. Lidstone, a narrative of another important survey, on which he has been engaged in the interval between his return from Demerara and the publication of his former work. His last expedition led him up the River Amazons and many of its tributaries, and his party navigated, in the little steamer provided for the service, 15,000 miles of that vast system of inland waters.

A remarkable journey has recently been performed by Dr. Crevaux in the region immediately to the east of Mr. Brown's Guiana explorations. This courageous traveller has succeeded in crossing the Tucumuraque range, forming the water-parting between Guiana and the lower Amazons. This range, though of no great altitude, has hitherto proved insurmountable, and indeed almost inaccessible, owing to the heat of the climate, the density of the forests, and the difficulty of procuring or conveying supplies. Dr. Crevaux has overcome these difficulties, and succeeded in descending the Jary River, flowing from the southern slope of the range to the Amazons.

Further south in Bolivia, another traveller, Dr. Wiener, commissioned, like Dr. Crevaux, by the French Government, has performed the great feat of ascending to the summit of Illimani, the grand snowy peak overhanging the old Inca city of La Paz. He has further established by hypsometrical observations the height of the mountain, proving it to be 20,109 feet. In the ascent he was accompanied by MM. Grumkow and Von Ohlfield. The height thus given approximates very closely to that ascertained by the enterprising Bolivian surveyor, Minchin, by trigonometrical measurement, the last results given by this gentleman being 21,039 feet. Pentland, the usual authority followed on this point, gave the height as 24,200; but it appears that he stated it, in his private correspondence with Humboldt, to be only 21,145.

In Peru, a further contribution to our knowledge of the navigable rivers, remote tributaries of the Amazons near the eastern base of the Andes, has been made by Mr. Wertherman, who made an adventurous and successful descent of the Rivers Perene, Tambo, and Ucayali, in October and November 1876, publishing a Report and excellent Map of his route at Lima in 1877.



In the extreme south, in Patagonia, Don Francisco P. Moreno, an Argentine savant devoted to anthropological studies, has been making a series of interesting explorations, adding much to our Geographical knowledge, as well as advancing the more special science which he cultivates. In 1875 he visited Lake Nahuelhuapi, situated in an elevated valley of the Andes in Southern Chili. In 1876 he made extensive researches at Chupat and Port Desire; afterwards exploring the River Santa Cruz. He has discovered traces of the existence of a primitive race of men in these regions, quite distinct from their present inhabitants.

AFRICA.—The most important event of the year in connection with African Exploration is the return of Mr. Stanley, bringing with him the news of his discovery of the course of the Congo from Nyangwe to the Yellala Falls. This great exploit brings to a fitting termination a journey which will take rank as one of the boldest and most successful that has yet been accomplished in this prolific field of Geographical enterprise. The chief incidents and results of Mr. Stanley's journey in its successive stages are now sufficiently well known, and the Members of the Society have had the further advantage of hearing an account of them from his own lips in his Lecture of the 11th of February last. It would be superfluous, therefore, to repeat them in this place; and with regard to the more purely Geographical results of his expedition, we are in expectation of learning more from Mr. Stanley himself, in the paper which he is to read at our next Evening Meeting. For the complete details, and for the excellent maps of his route which we learn are in preparation, we must be content to await the appearance of the narrative of his Travels now in course of publication.

Mr. Stanley's journey must exercise a great influence on all future plans of exploration in Central Africa. Whilst circumscribing the area remaining to be explored, and adding greatly to our knowledge of many wide regions previously little known, his successful journey will, on the other hand, no doubt increase the interest of the public in the subject, and supply a further stimulus to Geographical enterprise in the direction of those parts which still continue blank in our maps. For, in spite of the extent of country explored by Mr. Stanley, vast tracts on either side of his line of route, especially along the Congo, remain totally unknown, and will no doubt for years to come attract the adventurous and

afford subjects of speculation to Geographers. We may judge of this by the discussion that has already taken place regarding the identification of the great northern tributary, the Aruwimi, with the River Welle of Dr. Schweinfurth; Dr. Petermann being inclined to adopt the view, originally put forth, I believe, by Commander Cameron (who believes that his *Loua* is the Aruwimi), that these rivers are one and the same, and Dr. Schweinfurth, in the columns of 'L'Esploratore,' strenuously maintaining the contrary, showing, indeed, from what he and Miani saw of the Welle, that this important stream flows to the north-west, and must form part of the basin of Lake Chad. As far as we at present know, these regions will be for a long time closed against peaceful explorations, owing to the hostility of their inhabitants, and thus many problems of deep Geographical interest will remain long unsolved. The same may be said with regard to the tract of country lying between Albert Nyanza and Lake Tanganyika, where Mr. Stanley obtained a view of the great sheet of water which he named Beatrice Gulf, which, it seems now probable, does not form part of the Albert Lake. The tribes inhabiting this region and the surrounding country to the east and west are at present hostile to all of European race, and it will be long before the Geographical secret it contains—the line of water-parting between the basins of the Nile and the Congo—will be revealed to the world.

From the direction of the Nile little has been done since the journey of Colonel Gordon to Nyamyungo, near Victoria Nyanza, an account of which, with a reduction of the original map, was published in the volume of the 'Journal' last year. One of his officers, however, Colonel Mason-Bey, has recently circumnavigated, by steamer, Lake Albert, and reports that he has fixed by astronomical observation the position of the south-eastern and south-western corners of the Lake, showing that it terminates in  $1^{\circ} 11'$  lat. N. of the Equator, and is a much smaller sheet of water than had previously been supposed. If these conclusions be correct, and we learn from Colonel Gordon himself that Mason-Bey is a trustworthy observer, the interval between Lakes Albert and Tanganyika will be much wider than appears in our maps. But it is necessary to say that Sir Samuel Baker calls in question the latitudes of Colonel Mason-Bey, at least those taken at the southern end of the Lake, and believes that it stretches much farther to the southward than this officer reports. It will probably not be long before further surveys will be undertaken to set at rest this



disputed question. It is interesting to learn that the natives reported to Colonel Mason-Bey the existence of several lakes in the unexplored region to the south of the Albert; but the true southern shores of this lake, masked as they are by shallows and marsh vegetation, have not yet been definitely traced. The Report of Mason-Bey formed the subject of a sitting of the Khedivial Geographical Society at Cairo, on the 17th of February last, and is published, with maps, in the 'Bulletin' of the Society, No. 5. The judicious remarks on the occasion made by the Vice-President, General Stone, himself an able Geographer, are published in the same number.

According to the latest news from the Upper Nile, another traveller, under Colonel Gordon's auspices, has started for a long journey through the Equatorial Lake Regions. This is Dr. Emin Effendi, who had already, in August 1877, reached Mruli, marching thither from Magungo on Lake Albert, and had passed a month with the powerful chief Kaba Rega. His plan was to continue his travels southward to Uganda and Karagwé.

Remarkable progress has been made by the courageous leaders of the Church Missionary party which was despatched to Victoria Nyanza in 1876, in consequence of Stanley's report of the willingness of King M'tesa to receive Christian missionaries. Doubts of M'tesa's peaceful tendencies led the directors of the Mission to prefer commencing with King Rumanika of Karagwé, of whose friendly disposition towards Europeans there was less doubt. It was with the intention, therefore, of visiting King Rumanika that the party, arriving at the south shores of the Victoria from Zanzibar, launched their boat on the waters of the Lake; but their plans were changed by the arrival of messengers from King M'tesa with a friendly invitation, and at the end of June last, Lieutenant Shergold Smith and the Rev. Mr. Wilson set sail from Ukerewe Island for Uganda. From the north shore of the neighbouring island, Ukara, they sailed straight across the Lake, with a fine breeze, accomplishing the voyage of about 100 miles in a day and a night. They were received with great cordiality by the King, and a mission-station was immediately established near the royal residence. Lieutenant Smith re-crossed the Lake for other members of the Mission and for the dhow which he had left in course of construction at Ukerewe. The good fortune which had hitherto attended his efforts here forsook him. A misunderstanding with the chief of the island led to hostilities and the massacre of the

whole party; out of some eighty persons, including the Arab trader Sungoro, only three escaped. This deplorable event, which was preceded by the wreck of the dhow, will probably interrupt for some time the promising route to Uganda from Zanzibar, across the Victoria, which had been thus successfully opened; but we are assured that the missionary work at Uganda will not be discontinued, and that a reinforcement for Mr. Wilson's Mission is now on its way *viâ* Egypt and the Nile. Later intelligence, however, has been received, to the effect that Mr. Wilson has found it necessary to quit King M'tesa and has returned to Unyanyembe.

Nearer the East Coast, at Magila, in the picturesque country of Usambara, a station has been founded by members of the Universities' Mission, and advantage has been taken of the opportunity thus afforded by the Rev. Mr. Farler of the Mission to construct a map of the country, thereby making an interesting addition to our Geographical knowledge. A little further to the north, Dr. Hildebrandt, the well-known botanist, has made an attempt to reach Mount Kenia, from Mombaz, as Krapf had done before him, but was obliged to turn back, through the cowardice of his attendants and the alarming rumours of hostile natives in advance. The Rev. Thomas Wakefield, of the Ribé Mission, in the same region, has been making a tour in the Galla country, across the River Dana.

The attempt to establish a bullock-waggon route to Unyanyembe and Tanganyika has for the present failed, to the sincere regret of all who are interested in African exploration and civilisation, which the success of this new mode of travelling would have tended so powerfully to promote. The cause of the death of the oxen has been definitively ascertained by Dr. Kirk to be the tsetse fly, which he has proved, by specimens sent to him by a member of the missionary party, to be abundant in several places on the road. The Expedition, however, is pushing forward towards Ujiji, in spite of the losses and the delays it has encountered.

About 20 miles south of Zanzibar, at the excellent sea-port of Dar-es-Salaam, a work of another nature is in active progress, viz. the construction of a road by English engineers, with the full authority and sanction of the Sultan of Zanzibar. Of this highway, destined to aid materially in the opening up of East Central Africa to commerce and civilisation, by connecting the northern end of Lake Nyassa with a desirable port on the East Coast, 30 miles have already been completed, according to the



latest information. A project has been for some time under the consideration of the African Exploration Committee to send a small, but well-organized, Expedition to explore the country from the end of this road to Lake Nyassa, and thence to the south end of Tanganyika: to this I shall have occasion again to refer in the Conclusion of my Address.

In the important section of Central Africa of which Lake Nyassa may be considered the centre, further additions to our knowledge have lately been made by parties connected with the various British mission stations, of which there are now three in this region, belonging respectively to the Scottish Free Church, the Established Church of Scotland, and the Universities' Mission. The Established Church of Scotland has founded a Mission Station called *Blantyre*, 3000 feet above the sea, in the highlands east of the Shiré River, three days' march from Lake Shirwa, and two days from the point on the Shiré, where navigation recommences above the falls. The Free Church steamer *Itala* has been employed in cruises towards the north of the Lake, and members of the Universities' Mission have travelled from the East Coast to the residences of the inland chiefs, towards the head-waters of the Rovuma. The same Missionary Society has now indeed a settlement at Msasi, in the interior, north of the Rovuma, from which Mr. Beardall, in August to October last year, made a journey to Mwembe, the chief town of the powerful chief Mataka, near the eastern shore of Nyassa. This part of Africa may be said now to be fairly well known, although, of course, much remains to be done in districts away from the lines of travel. As a proof of the rapid progress of events and the important practical results which follow Geographical exploration, I may mention that a party of enterprising Englishmen are now preparing to place on Lake Nyassa one or more large sailing-vessels for the purposes of trade and opening up the country. The ships will be constructed at Quillimane, and taken in sections to be rebuilt on the shores of the Lake. Experience has shown that larger vessels are required on this stormy inland sea than the small steamers and steel boats which have been used hitherto.

A large tract of previously unknown country, to the north of the Lake, has quite recently been traversed by an Expedition with more purely Geographical aims, under the late Captain Elton, our Consul at Mozambique. We have recently had the pleasure of listening in this Hall to an account of this interesting journey, from Mr. H. B. Cotterill, who formed one of the party. Landing from the

missionary steamer on the northern shores of Nyassa, the Expedition, consisting of Mr. Cotterill and three other Englishmen, besides the leader, struck across a mountainous country which closes in the Lake basin on the north, and, overcoming the serious obstacles presented by the hostility of warlike tribes, succeeded, after a long and toilsome march nearly due north, in reaching the Ujiji and Zanzibar caravan-road, at Usekhe, in Ugogo, where the gallant leader of the band died of sun-stroke. In him the public lost a valuable servant, and African Geography an intrepid explorer. The remainder of the party continued their journey to Zanzibar. By this bold exploit another of the great blanks in the map of Central Africa has been scored through, and a great accession made to our Geographical knowledge. The party crossed, in their northerly march, the upper Rufiji, or Ruaha, as Speke named it on his map; and the newly-explored line, added to those further west traversed by Livingstone and Livingstone's followers, and the recent naval surveys towards the mouth of the Rufiji, place us in possession of a fair general knowledge of the leading features of this part of Africa.

On the West Coast we hear of the recent despatch of a pioneer party to San Salvador, near the Congo, by the Baptist Missionary Society, and of preparations made, under the auspices of the Church Missionary Society, to send a steamer towards the head-waters of the Binné affluent of the Niger. At Hamarua, on this river, as we were informed by Bishop Crowther, native traders are sometimes met with who have traversed the whole blank expanse of Equatorial Africa lying between the Upper Binné and Lakes Albert and Tanganyika. The navigation of the river by the missionary steamer presents, therefore, a favourable opportunity for securing a basis for an entirely new field of exploration, and the African Committee have reason to be grateful to the Church Missionary Society for having offered a passage on board their steamer to any explorer that may be sent out by the Committee.

Such is a brief summary of recent African enterprises on the part of our own countrymen. But other European nations have also been active in the same field; and the preparations that are being made in some quarters give promise of further explorations on a very considerable scale. Thus we hear of the amalgamation of the two German Societies—the new one formed to co-operate with the Belgian International Commission and the older Society for the exploration of Central Africa; the united Society having,



we are further informed, added practical commercial objects to its programme, and obtained from the Government a grant of 5000*l.* in aid of its operations. One traveller, Herr Schütt, has already been sent out by the Society, with the object of penetrating to the capital of the Muata-Yanvo, and news has recently been received of his arrival at Loanda.

The German papers announce that Hermann Soyaux, the botanist of the German Expedition to the Loango coast, 1873-76, will set out in July or August on another expedition to Equatorial Western Africa, to explore the Gaboon and Ogowé country in the interests of natural science, and at the same time, under the patronage of the Hamburg firm of Wormann, to make experiments with a view to the starting of plantations. A long account of Herr Soyaux's travel in Loango and Angola is about to appear, published by Messrs. Brockhaus.

The Expedition despatched by the Belgian Commission to establish stations and undertake explorations on Lake Tanganyika and beyond, reached Zanzibar at the close of last year, but met there with a serious calamity in the loss by death of its two principal members, MM. Crespel and Maes. This untoward event, by which two more valuable lives have been added to the long list sacrificed in the cause of African scientific and philanthropic enterprise, has caused, however, no delay in carrying out the objects of the Expedition, and two other officers were promptly selected in Belgium to fill their places, while the rest of the party made a preparatory trip into the interior. We now hear that the two officers, MM. Wautier and Dutrieux, have arrived out, and that M. Cambier, the chief, was preparing for a final start at the end of May. M. Marno, one of the original party, has left, and is now on his way to Europe.

The Portuguese Expedition, so munificently supported by its Government, is now well on its march towards the interior. The area of country chosen for its operations is that which includes the head-waters of the three important streams—the Zambesi, the Kassai, and the Cuñene. The starting-point of the expeditionary party was Benguela, which it left on the 12th November last, and it has already been heard of as far advanced in the direction of Bihé. Besides fixing accurately the latitude and longitude of places, the Expedition makes observations in meteorology and terrestrial magnetism, and takes photographic views on the way.

The French Expedition under M. de Brazza on the Ogowé, as is the fate of most Central African undertakings, has met with many difficulties and delays. One of the party, M. Marche, has been compelled to return, invalided, to Europe, leaving M. de Brazza and Dr. Ballay at Doumé preparing to ascend to the falls of Poubara. In its upper course, it is remarked that this river bends more and more to the south, giving rise to the supposition that it may be an arm of the Congo. Many problems in the Geography of Central Africa will be set at rest if the journey about to be undertaken by Lieut. de Semellé proves successful. This enterprising officer is about to explore the great blank in Central Africa lying between the Congo, the Albert Nyanza, and the southern tributaries of the Niger, by ascending the latter river and proceeding by land along the south bank of the Binué to its upper waters, and thence striking across the unknown regions towards the Equatorial Lakes. He set sail from Bordeaux on the 5th of April.

A still more important Expedition has been recently prepared in France, having for its object, in emulation of Cameron and Stanley, the traversal of the entire continent, from the coast near Zanzibar to the mouth of the Congo. It originated quite independently of the French African Committee, which has scarcely yet completed its organisation, and is supported by the French Government, the Chamber of Deputies having in February last voted a sum of 100,000 francs for its support. The leader, M. l'Abbé Debaize, is spoken of as most thoroughly qualified for the enterprise he has offered to carry out, and which is to be purely secular and scientific in its aims. He set sail for Zanzibar on the 21st of last month. A large scheme of Roman Catholic Missions in Central Africa, quite independent of l'Abbé Debaize's journey, has been elaborated at the same time, and we hear that nine missionaries left on the same date as this traveller, for the purpose of founding the new stations on the shores of the great lakes Tanganyika and Victoria and Albert Nyanza. These Central African Missions, it is stated, are simply an extension of the work of the *Société des Missionnaires d'Alger*, founded ten years ago by the Archbishop of Algiers, and which has already twelve mission-stations among the Kabyle and Arab tribes of the Sahara. The missionaries now on their way to Central Africa are all young men, thoroughly acclimatized, and familiar with Arabic, both written and spoken.

This recent action of the French makes the third instance of European Governments contributing directly to the costs of African



Explorations:—the Portuguese; the German; and the French: all by parliamentary votes. The Italian Government also, through the Minister of Public Instruction, has subscribed a sum towards the National Fund for the Antinori Expedition, which had for its object the exploration of the wide tract of unknown country lying between Shoa and Victoria Nyanza. This important Italian undertaking has also met with great obstacles, arising from the unsettled state of the country and the opposition of the Galla tribes. One of the members, Captain Martini, has returned to Europe, with scientific collections made by the Expedition. Happily the report of the death of Marquis Antinori has proved to be a false rumour; the chief, together with Signor Chiarini, being, on the departure of Captain Martini, on the eve of starting from Shoa southwards. Another Italian Expedition, organised independently, is now on its way to Shoa. It has for its leaders Signors Gessi and Matteucci, and is proceeding by way of the Nile and Kaffa to Southern Abyssinia.

*Conclusion.*—In my last Anniversary Address I called your attention to the nomination of an African Exploration Fund Committee, for the purpose of promoting the efforts making in so many quarters to open up the interior of Africa to civilisation and commerce by the prosecution of further researches and explorations as to the Geography of the Central regions more especially.

The Report of that Committee is now ready to be presented to the subscribers, and I am glad to be able to announce, in anticipation of further details, that the Committee have come to the resolution to recommend the despatch of a carefully organised Expedition to explore the country lying between the caravan-road, now constructing from Dar-es-Salaam (a few miles south of Zanzibar) and the northern end of Lake Nyassa; and should the Expedition thus planned reach that goal successfully, and adequate funds are available, it is contemplated to push on exploration to the southern end of Lake Tanganyika, a further distance of 190 miles, thus completing approximately Nos. 3 and 4 of the Routes originally proposed in the Circular issued by the Committee. The Council, in view of such renewed effort to obtain valuable Geographical information, have voted for this year a further grant of 500*l.* to the Exploration Fund. With such additional aid, and what subscriptions may be received from the public and subscribers, the Committee feel that they may confidently undertake to set on foot, without further loss of time, the proposed Expedition.

It now only remains for me, on my retirement from the office of President, to congratulate the Society on the choice which has fallen upon the Earl of Dufferin for my successor. Distinguished alike as a Statesman and a Scholar, and no less generally known as a traveller and an accomplished man of the world, with all the qualifications of a great administrator and ruler, I could not desire any better fortune for the Society or myself than to resign my trust into such hands. In Lord Dufferin's keeping we shall feel assured that the character and usefulness of the Society will not only be perfectly safe, but the Society itself receive new lustre from the association of his name as its President.



NOT A NEGOTIABLE SECURITY

THIS SECURITY IS NOT A NEGOTIABLE SECURITY

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## PAPERS READ

BEFORE THE

# ROYAL GEOGRAPHICAL SOCIETY

DURING THE SESSION 1877-78.

[FORMING VOL. XLVIII. OF THE SOCIETY'S JOURNAL.  
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I.—*A Visit to the Valley of the Yenisei.* By HENRY SEEBOHM.

[Read, January 14, 1878.]

THREE hundred years ago, when Ivan the Terrible reigned over Russia, and the Slav and Tartar races were struggling in mortal combat, a peaceful expedition left the shores of Britain under the command of Sir Hugh Willoughby. Three ships were sent to the Arctic regions on a wild-goose chase after the semi-fabulous land of Cathay, a country where it was popularly supposed that the richest furs might be bought for an old song, where the rarest spices might be had for the plucking, and where the rivers rippled over sands of gold. The expedition proved a failure. Poor Sir Hugh Willoughby discovered Nova Zembla, but was afraid to winter there, and landed on the shores of the Kola peninsula, where he and all his crew were starved to death. Another ship, belonging to the same expedition, commanded by Richard Chancellor, was more fortunate. It was separated from the others by a heavy storm, and driven by contrary winds into the White Sea. Chancellor not only saved his ship and the lives of his crew, but discovered Archangel, which subsequently became a little English colony. At that time the inhabitants of Archangel were actually carrying on a trade with this wonderful land of Cathay. In their flat-bottomed "lodkas," sewn together with willow-twigs, they skirted the east coast of the White Sea, and dragged their boats across the Kanin peninsula. They coasted the southern shores of the Arctic Ocean, and passing through the Kara Gates, entered the Kara Sea. On the Yalnal peninsula they found a river, the



head of which brought them to a narrow watershed, across which they dragged their boats into another river, which brought them into the gulf of the Obb. Crossing this gulf they entered the gulf of the Taz, at the head of which was the once famous town of Mangasee, where a great annual fair was held. This fair was frequented by merchants, who bought tea, silks, and spices, down the Obb and the Yen-e-say',\* to barter with the Russian merchants, who returned to Archangel the same season.

In the "struggle for existence," which commenced on the opening out of the port of Archangel to British commerce, according to the inevitable law of the "survival of the fittest," this Russian maritime enterprise languished and finally died, and thenceforth the inhabitants of the banks of the Dwina received their silks and their tea *viâ* the Thames instead of the Obb and the Yen-e-say'; and ever since the commercial world seems to have taken it for granted that the Kara Sea was unnavigable—that the Kara Gates were closed by impenetrable bars of ice.

During the last few years considerable efforts have been made, principally by Professor Nordenskiöld, of Stockholm, and Captain Wiggins, of Sunderland, to re-open this ancient route, and to re-establish a trade to Siberia *viâ* the Kara Sea. In 1874 Captain Wiggins chartered the well-known Arctic steam yacht the *Diana*, and passing through the Kara Gates, explored the entrance to the Obb and the Yen-e-say', and returned to England in safety. In 1875 Professor Nordenskiöld chartered a walrus sloop at Hammerfest, and entering the Kara Sea through the Matoshkin Scar, landed in the gulf of the Yen-e-say'. The walrus sloop returned to Europe in safety, leaving the Professor to make his way up the river in a boat as far as Yen-e-saisk', whence he returned to Stockholm by the overland route.

In 1876 both these gentlemen attempted to take a cargo to Siberia *viâ* the Kara Sea. Professor Nordenskiöld was the first to arrive, and fortunately failing to find a channel up the Yen-e-say' deep enough for his steamer, he landed his goods at a little village called Kor'e-o-poff-sky, about a hundred miles up the Yen-e-say', and returned to Europe in safety. As will hereafter appear, Captain Wiggins was less fortunate. He left Sunderland on the 8th of July in the *Thames*, Arctic steam yacht (120 tons), and entered the Kara Sea on the 3rd of August.

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\* The Russian names in this Paper are all spelt phonetically. The only explanation required is that *kh* represents the German guttural *ch*. I have accented the syllable upon which the *emphasis* must be laid, a very important point in the pronunciation of Russian.

The ice prevented him from sailing direct to the mouths of the Great River, so he spent some time in surveying the coast and the By'-der-at'-skerry Gulf, and did not reach the gulf of the Obb until the 7th of September. Here he lay at anchor some time in the hope that a favourable wind might enable him to ascend the Obb against the strong current; but the weather proving tempestuous and the wind contrary, he abandoned the attempt and ran for the Yen-e-say'. He commenced the ascent of that river on the 23rd of September, and after a tedious voyage, struggling against contrary winds and shallow water, he finally laid his vessel up on the Arctic Circle, half a mile up the Koo-ray'-i-ka, on the 17th of October, 1200 miles from the mouth of the Yen-e-say'. The following morning the ship was frozen up in winter quarters. A room in a peasant's house on the banks of the river looking down on to the ship, was rigged up for the crew, and as soon as the ice on the river was thick enough to make sledging safe, Captain Wiggins returned to England by the overland route.

In 1875 Harvie-Brown and I visited the delta of the Petchora in North-east Russia, and brought home an unusually interesting collection of birds, eggs, and ethnographical curiosities from the "tundras" of Siberia-in-Europe. In 1876 Drs. Finch and Brehm made an expedition to the Obb, extending still further to the east our recent zoological and ethnographical knowledge of these interesting regions. Hearing that Captain Wiggins was in England, and likely to rejoin his ship with the intention of returning in her to Europe through the Kara Sea, I lost no time in putting myself in communication with him. I was anxious to carry our ornithological and ethnographical researches a step further to the eastward, so as to join on with those of Middendorf, Schrenck, and Radde, in East Siberia. I made the acquaintance of Captain Wiggins on the 23rd of February, and came to the conclusion that an opportunity of travelling with a gentleman who had already made the journey, and consequently "knew the ropes," might never occur again. Captain Wiggins told me that it was his intention to start from London on the return journey in three days. I finally arranged with him to give me five days in which to make the necessary preparations for accompanying him. I wrote to Count Schouvaloff, who had given my companion and myself excellent letters of introduction on our Petchora journey, asking him to be kind enough to send me to my rooms in London similar letters for my proposed Yen-e-say' journey, and I am happy to have an opportunity of publicly expressing my warmest thanks to his Excellency for his kindness in furnishing me, at a moment's notice, with letters of introduction to General Timarscheff, the Minister of the Interior,



which proved of the greatest service to me on my long and adventurous journey.

We left London on Thursday, the 1st of March, at 8.25 P.M., and reached Nishni Novgorod on Saturday, the 9th inst., at 10 A.M., having travelled by rail a distance of 2400 miles. We stopped three days in St. Petersburg to present our letters of introduction and to pay some other visits. At Nishni we bought a sledge, and travelled over the snow 3240 English miles, employing for this purpose about a thousand horses, eighteen dogs, and forty reindeer. We left Nishni on the evening of the 10th of March, and travelled day and night in a generally easterly direction, stopping a couple of days at Tyu-main', and a day at Omsk, and reached Kras-no-yarsk' on the morning of the 2nd of April, soon after crossing the meridian of Calcutta. We rested a day in Kras-no-yarsk', and sledged thence nearly due north, spending four days in Yen-e-saisk' and three days in Toor-o-kansk'.

For the first two days we found sledge-travelling somewhat irksome; but we soon got into the full swing of it. After having sledged a thousand miles or so, we began to feel that the process might go on for weeks or months, or even years, without serious results. I soon began to enjoy it. My sledge-fever entirely left me; and I used to find a pleasant lullaby in the never-ceasing music of the "wrangling and the jangling of the bells." However rough the road was I enjoyed a good night's rest; and if an unusually heavy "lee lurch" or "weather roll" jolted me against my companion, we only muttered that there was "a heavy sea on," and dozed off again. Snow, wind, rain, sunshine, day, night, hills, valleys, plains, rivers, good roads, bad roads, it was all the same; on we went, and nothing stopped us. The scenery through which we passed was very various. The first 1000 miles was hilly and well wooded. One might imagine one was sledging through an endless Sherwood Forest, with a hundred miles of the Peak of Derbyshire placed in the middle to represent the Urals. The ground was covered with from 2 to 3 feet of snow. Sometimes we seemed to be sledging down a "broad drive," sometimes crossing a peak, and occasionally passing through a village. The forests were principally spruce-fir, with a little larch and Scotch fir, and plenty of birches. Sometimes we sledged for miles through avenues of birches. The Ural range is a succession of hills, which it took us some time to get through; but the loftiest peak can scarcely be dignified with the name of mountain. Between Tyu-main' and Tomsk we had nearly a thousand miles of a totally different class of scenery. The steppes of South-western Siberia might be compared to Salisbury Plain. As far as the eye could reach,

nothing was visible but snow, sky, and telegraph-lines. Now and then we came upon a few stunted birches; and every 15 or 20 miles we passed through a village. About a hundred miles before reaching Tomsk we again found ourselves amongst hills and forests, which continued until the road permanently established itself down the broad river.

The Yen-e-say' is said to be the third largest river in the world, being only exceeded in size by the Amazon and the Mississippi. The principal stream rises in the mountains of Central Mongolia, enters Siberia near the famous town of Kyakh'-ta, on the Chinese frontier, and flowing through Lake By-kal', passes Eer-kutsk' (Irkutsk) the capital of Siberia, under the name of the An'-go-ra or Vairkh'-nya, Tun-goosk', and enters the smaller stream, whose name it subsequently bears, a few miles to the south of Yen-e-saisk'. Up to this point its length may be roughly estimated at 2000 miles, and judging from the time it takes to sledge across the river at Yen-e-saisk', its width must exceed an English mile. Following the windings of the river from the latter town to the Arctic circle, the road is calculated as a journey of 800 miles, during which the waters are augmented by two important tributaries, the Pod-kah'-min-a Tun-goosk' and the Nizh'-ni Tun-goosk', which increase the width of the river to more than three English miles. On the Arctic circle it receives an important tributary, the Koo-ray'-i-ka, about a mile wide, and, somewhat more circuitously than appears on our maps, travels to the islands of the delta, a distance possibly slightly over-estimated at 800 miles, during which the average width may be about 4 miles. The delta and lagoon of the Yen-e-say' are about 400 miles in length, and must average 20 miles in width, making the total length of the river about 4000 miles.

Throughout the whole extent of the river, as far as I travelled upon it, from Yen-e-saisk', in lat.  $58^{\circ}$  to Gol-chee'-ka in lat.  $71\frac{1}{2}^{\circ}$ , the banks are generally steep and lofty, from 60 to 100 feet above the water-level, and, so far as I could learn, comparatively little land is covered by the summer floods. In this respect it presents a marked contrast to the Obb. The villages on the banks are from 20 to 30 versts (15 to 20 miles) apart, and are of course built upon high ground. In the winter, relays of horses and sledges, and in the summer, of rowers and boats, are to be obtained at these villages. As we sledged down the river, we had always a heavy climb up to the post stations; and in descending again into the bed of the river, it sometimes almost made our hearts jump into our mouths to look down the precipice, which our horses took at a gallop, with half-a-dozen villagers hanging on the sledge to prevent an upset, a feat which



they performed so cleverly, that, although many a peasant got a roll in the snow, we always escaped without any serious accident. We found a good supply of horses as far as Too-ro-kansk'. The second stage from this town we travelled by dogs, and completed the rest of the journey with reindeer. The dogs were fine fellows, black, white, piebald or brown, with long hair, small ears, and bushy tail turned over the back. They never seemed tired, never tried to shirk their work, were good-natured and tractable in the extreme, and are so sagacious that it is a common practice, at the end of a stage, to send the team back to the last station alone with the empty sledge. The harness is of the simplest construction possible, being nothing but a padded belt over the small of the back, passing underneath to the sledge between the hind legs.

Soon after leaving Yen-e-saisk' agriculture practically ceases. A few cows graze on the meadows near the villages, and hay is cut for their use during winter, but the villagers are too busy fishing during the short summer to till the land. At Sil-o-vah'-noff, however, not far from Too-ro-kansk', the unfortunate Scop'-si cultivate potatoes successfully.

The banks of the Yen-e-say' are clothed with magnificent forests up to the Arctic circle, but northwards the trees rapidly diminish in size, and disappear altogether soon after leaving Doo-din'-ka, in lat.  $69\frac{1}{2}^{\circ}$ . These forests are principally pine of various species. The larch extends further north than any of the other pines, and is abundant, though small, at Doo-din'-ka. Further south it attains large dimensions. At Yen-e-saisk' a larch pole suitable for the mast of a ship, 36 inches diameter at the base, 18 inches diameter at the apex, and 60 feet long, may be bought for a sovereign. This hard, dark wood looks very well for the walls and ceilings of the peasants' rooms. The spruce fir, perhaps the most elegant tree in the Yen-e-say' forests, with branches almost down to the root, and trailing on the ground, is still more abundant, and extends nearly as far north, say to lat.  $60^{\circ}$ . The Siberiaks look upon this tree as one of the most important for commercial purposes. The wood is white, of very small specific gravity, and very elastic, and is said not to lose its elasticity by age. It is the favourite tree for ships' masts, and is considered the best substitute for ash for oars. Snow-shoes are also generally made of this wood. The quality is good down into the roots, and it makes the best knees for shipbuilding, not requiring to be cut out of the solid or artificially bent. It is, however, subject to very hard knots, which are said to blunt the edge of any axe not made out of Siberian steel. The Siberian spruce is less abundant, and does not extend so far north. I did not observe it north of lat.  $63^{\circ}$ .

It differs from the common spruce in having a smooth bark of an ash-grey colour. The leaves are also of a much darker, bluer green. It has little commercial value on the Yen-e-say, the wood being soft, and liable to crack and decay. Being easy to split, it is largely used for firewood and for roofing. The Scotch fir, with the upper trunk and branches almost of a cinnamon yellow, is in many places the most abundant forest tree, but does not extend further north than lat.  $62\frac{1}{2}^{\circ}$ . The Siberiak is, however, proudest of his cedar, a tree very similar in appearance to the Scotch fir, but more regular in its growth, clothed with branches nearer to the ground, and with an almost uniform grey trunk. The wood is dark, but not so dark as larch, and there is very little of the white inferior wood next the bark. If stacked too long in the forest, it is liable to be attacked by the worm, but for furniture and indoor work it is considered to be the best timber in Siberia. It is said never to rot, or shrink, or warp, or crack. It is soft and easy to work, but has nevertheless a fine grain, and is almost free from knots. The Ost'-yaks use it for building their ships. They take a trunk 2 or 3 feet in diameter, split it, and of each half make a wide, thin board. The rest is wasted. Such an extravagant tool is the axe! The Russian peasant is still more prodigal with his timber. It is by no means an uncommon thing to see magnificent cedars cut down, merely to be stripped of their cones, to provide the peasant with a sackful of his favourite cedar-nuts. I noticed this tree up to lat.  $67\frac{1}{2}^{\circ}$ . The birch is common up to lat.  $69\frac{1}{2}^{\circ}$ , and in various places I noticed that, where a pine-forest had been burnt or cut down, it appeared to be immediately replaced by a luxuriant growth of birch. The creeping birch and two or three sorts of willow are common in suitable localities on the "tundra" as far north as we went, *i.e.* lat.  $71\frac{1}{2}^{\circ}$ . The alder was abundant at  $69\frac{1}{2}^{\circ}$ , and the juniper at  $69^{\circ}$ . I did not observe the poplar further north than lat.  $66^{\circ}$ . The Ost'-yaks hollow their canoes from the trunks of this tree.

We experienced great variety of weather on our journey out. In St. Petersburg we alternated between a slight thaw and a gentle frost. In Moscow and Nishni the snow was melting rapidly. On the Volga we had occasionally to sledge through a foot of water and half-melted snow. Over the Ural hills we had bright sunshine and hard frost. Across the steppes the weather was mild, but there was no absolute thaw, and we had now and then slight snow-storms. After leaving Tomsk the weather became decidedly milder; and when we reached Krasno-yarsk' we found a warm south-wester blowing, the streets running with water, and everybody travelling on wheels. Our journey northwards was a complete race with the south wind.



The red hills of Kras-no-yarsk' were already bare of snow; the south-wester continued blowing as warm as ever; sledge-travelling had, for the time being become impossible, and we were obliged to organize a caravan. For two stages we travelled in a "tyel-ay'-ga," with one "tar-an-tass'" for our baggage, and a second for the empty sledge. For the next two stages the road was covered with snow, though it was somewhat soft; but we dismissed a couple of our equipages, travelling ourselves in the sledge, and retaining only one "tar-an-tass'" for the baggage. For the rest of the journey to Yen-e-saisk' we had brilliant sunshine and hard roads. The south wind, however, overtook us before we left that town, and for some days we had very sloppy travelling; but we pressed on day and night until we reached the entrance to the Kah'-min Pass, the most dangerous part of the journey, where the river flows through a comparatively narrow defile, between high walls of limestone rocks, with such velocity that in the middle of the stream open water remains all the winter. We reached the station before this pass in the evening, in a drenching rain, the first shower we had experienced, and were told that it was impossible to proceed until a frost should set in. When we rose in the morning we were both surprised and delighted to find the thermometer at or near zero; and the remainder of our journey was accomplished without a thaw.

We reached the Koo-ray'-i-ka on the 23rd of April, and found the crew of the *Thames* in excellent health. Captain Wiggins had left his men plenty of lime juice, of which they made regular use; he also provided them with accommodation in a Russian peasant's house, which admitted of easy ventilation, and left strict orders with the mate that the winter was not to be spent in idleness, but that firewood for the return journey was to be cut and stacked. By attending to these three sanitary regulations, *lime juice*, *ventilation*, and *exercise*, the crew passed through the winter without a sign of scurvy. The crew of Sideroff's schooner, which wintered the same year only three or four degrees further north, neglected all these precautions. The consequence was that they all died of scurvy, except the mate, who was fortunate enough to recover from the disease.

The winter quarters chosen by Captain Wiggins were very picturesque. Standing at the door of the peasant's house on the brow of the hill, we looked down on to the "crow's nest" of the *Thames*. To the left the Koo-ray'-i-ka, a mile wide, stretched away some 4 or 5 miles, until a sudden bend concealed it from view; whilst to the right the eye wandered across the snow-fields of the Yen-e-say', and by the help of a

binocular the little village of Koo-ray'-i-ka might be discerned about 4 miles off, on the opposite bank of the great river. The land was undulating rather than hilly, and everywhere covered with forest, the trees reaching frequently 2, and in some rare instances 3, feet in diameter. The depth of the snow varied from 4 to 6 feet; and travelling without snow-shoes, except on the hard-trodden roads, was of course utterly impossible. I generally made two rounds a day through the forest, and soon exhausted the ornithology of the district. During the first week I succeeded in identifying twelve species of birds. For the next four weeks I only increased my list by a weekly average of three species. June is the month in which nearly all migratory birds arrive in the Arctic circle. In the three weeks between the 29th of May and the 18th of June I added sixty-five birds to my list, and afterwards only occasionally picked up a new bird which had escaped my notice.

When we arrived at the ship, we found that it was still winter, and were told that there had not been a sign of rain since last autumn. April went by and May came in, but still there was no sign of summer, except the arrival of some of the earliest migratory birds. We generally had a cloudless sky; and the sun was often burning hot. Here and there, on some steep bank exposed to the south, a slight impression was made upon the snow; but not a drop of water survived the night frosts. On the 9th, 10th, and 11th of May we had rain for the first time, and the prospects of summer looked a little more hopeful. The rest of May, however, was more dreary and wintry than ever, alternations of hard frosts and driving snow-storms; but the river was slowly rising, and outside the thick centre ice was a strip of thin, newly-frozen ice. There was, however, little or no change in the appearance of the snow. Up to the end of May the forces of winter had gallantly withstood the fiercest attacks of the sun, and remained masters of the field. On the 1st of June the sun, baffled at all points, entered into an alliance with the south wind, and a combined attack was made upon the winter forces. The battle raged for fourteen days, the battle of the Yen-e-say', the great event of the year in this cold country, and certainly the most stupendous display of the powers of nature that it has ever been my lot to witness. On the morning of the 1st of June the pressure underneath the ice caused a large field, about a mile long and a third of a mile wide, opposite the lower angle of junction of the Koo-ray'-i-ka and the Yen-e-say', to break away. About half the mass found a passage down the strip of newly-formed thin ice, leaving open water behind it. The other half rushed headlong on to the steep banks of the river. The result of the collision was a little



range of mountains, 50 or 60 feet high, and picturesque in the extreme. Huge blocks of ice, 6 feet thick and 20 feet long, in many places, were standing perpendicular, whilst others were crushed up into fragments like broken glass; and in many other places the ice was piled up in layers one over the other. The real ice on the river did not appear to have been thicker than two to three feet, clear as glass, and blue as an Italian sky. Upon the top of this was about 4 feet of white ice. This was as hard as a rock, and had, no doubt, been caused by the flooding of the snow when the waters of the river had risen, and its subsequent freezing. Upon the top of the white ice was about 18 inches of clean snow, which had evidently never been flooded. When we turned into our berths in the evening the captain thought it most prudent to institute an anchor-watch. We had scarcely been asleep an hour before the watch called us up with the intelligence that the river was rising rapidly, and that the ice was beginning to crack. We immediately dressed and went on deck. We saw at once that the Yen-e-say' was rising so rapidly that it was beginning to flow up its tributaries. A strong current was setting up the Koo-ray'-i-ka, and small floes were detaching themselves from the main body of the ice and were running up the open water. By-and-by the whole body of the Koo-ray'-i-ka ice broke up and began to move up stream. Some of the floes struck the ship some very ugly blows on the stern, doing considerable damage to the rudder; but open water was beyond, and we were soon out of the press of ice, with, we hoped, no irretrievable injury. All this time we had been getting steam up as fast as possible, to be ready for any emergency. It was hopeless to attempt to enter the creek opposite which we were moored, and which was now only just beginning to fill with water; but on the other side of the river, across only a mile of open water, was a haven of perfect safety. But, alas! when the ice had passed us, before we could get up sufficient steam, the river suddenly fell 3 feet, and left us aground by the stern, and immovable as a rock. Nor was it possible, with a current running up the river at the rate of 4 knots an hour, to swing the ship round so as to secure the rudder against any further attacks of the ice. Half a mile ahead of us, as we looked down the river, was the edge of the Yen-e-say' ice. The river was rising again; but before the stern was afloat we discovered, to our dismay, that another large field of ice had broken up; and the Koo-ray'-i-ka was soon full of ice again. In the course of the night the whole of the ice of the Yen-e-say', as far as we could see, broke up with a tremendous crash, and a dense mass of ice-floes, pack-ice, and icebergs backed up the Koo-ray'-i-ka, and with irresistible force

drove the Koo-ray'-i-ka ice before it. When it reached the ship, we had but one alternative, to slip the anchor and let her drive with the ice. For about a mile we had an exciting ride, pitching and rolling as the floes of ice squeezed the ship, and tried to lift her bodily out of the water, or crawl up her sides like a snake. The rudder was soon broken to pieces, and finally carried away. Some of the sailors jumped on to the ice and scrambled ashore, whilst others began to throw overboard their goods and chattels. Away we went up the Koo-ray'-i-ka, the ice rolling and tumbling and squeezing alongside, huge lumps climbing one on the top of another, until we were finally jammed in a slight bay, along with a lot of pack-ice. Early in the morning the stream slackened, the river fell some 5 or 6 feet, and the ice stood still. The ship went through the terrible ordeal bravely. She made no water, and there was no evidence of injury beyond the loss of the rudder. In the evening the ship was lying amidst huge hummocks of ice, almost high and dry. The Koo-ray'-i-ka, and right across the Yen-e-say', and southward as far as the eye could reach was one immense field of pack-ice, white, black, brown, blue, and green, piled in wild confusion as close as it could be jammed. Northwards the Yen-e-say' was not yet broken up. All this time the weather was warm and foggy, with very little wind, and occasional slight rain. There was a perfect Babel of birds as an accompaniment to the crashing of the ice. Gulls, geese, and swans were flying about in all directions; and their wild cries vied with the still wilder screams of the divers. Flocks of redpolls and shore-larks, and bramblings and wagtails in pairs, arrived, and added to the interest of the scene. On the 2nd of June there was little or no movement in the ice until midnight, when an enormous pressure from above came on somewhat suddenly, and broke up the great field of ice to the north of the Koo-ray'-i-ka, but not to a sufficient extent to relieve the whole of the pressure. The water in the Koo-ray'-i-ka rose rapidly. The immense field of pack-ice began to move up stream at the rate of 5 or 6 knots an hour. The poor ship was knocked and bumped along the rocky shore, and a stream of water began to flow into the hold. At 9 o'clock all hands left her, and stood upon the snow on the bank, expecting her instant destruction. The stream rose and fell during the day; but the leak, which was apparently caused by the twisting of the stern-post, choked up. Late in the evening an opportunity occurred of a few hours' open water, during which steam was got up; and by the help of a couple of ropes ashore, the rudderless ship was steered into the little creek opposite to which she had wintered, and run ashore. Here the leak was afterwards repaired and a



new rudder made. We calculated that about 50,000 acres of ice passed the ship up stream during these two days; and we afterwards learned that most of this ice got away some miles up the Koo-ray'-i-ka, where the banks were low, and was lost in the forest.

The battle of the Yen-e-say' raged for about a fortnight. The sun was generally burning hot in the daytime; but every night there was more or less frost. The ice came down the Yen-e-say' at various speeds. Sometimes we could see gigantic masses of pack-ice, estimated at 20 to 30 feet in height, driven down the river at an incredible pace, not less than 20 miles an hour. In the Koo-ray'-i-ka the scene was constantly changing. The river alternately rose and fell. Many square miles of ice were marched up for some hours, and then marched back again. Sometimes the pack-ice and floes were jammed so tight together that it looked as if one might scramble across the river without difficulty. At other times there was a good deal of open water, and the icebergs "calved" as they went along with much commotion and splashing, that could be heard half a mile off. Underlayers of the iceberg ground; and after the velocity of the enormous mass has caused it to pass on, the pieces left behind rise to the surface, like a whale coming up to breathe. Some of these "calves" must come up from a considerable depth. They rise up out of the water with a great splash, and rock about for some time before they settle down to their floating-level. At last the final march past of the beaten winter-forces in this great fourteen days' battle took place, and for seven days more the rag, tag, and bob-tail of the great Arctic army came straggling down—worn and weather-beaten little icebergs, dirty ice-floes that looked like mud-banks floating down, and straggling pack-ice in the last stages of consumption. The total rise of the river was upwards of 70 feet.

The moment that the snow disappeared vegetation sprang up as if by magic, and the birds made preparations for breeding. Although I had taken the precaution of providing myself with a ship, the misfortunes of Captain Wiggins delayed me on the Arctic circle for some weeks. As we passed through Yen-e-saisk' I bought a schooner of a ship-builder of the name of Boiling, a Heligolander. I christened it the *Ibis*; and on the 29th of June we left the Koo-ray'-i-ka with this little craft in tow. Our progress down the river, however, was one catalogue of disasters, ending in our leaving the *Thames* on the 9th of July a hopeless wreck, lying high and dry on a sand-bank, in lat. 67°. As we sailed northwards in the *Ibis* the forests became smaller and smaller, and disappeared altogether about lat. 70°. The highest point we reached was lat. 71½°, where I sold the

*Ibis* to the captain of a Russian schooner, which had been totally wrecked during the break-up of the ice.

During this voyage we came into contact with several of the native races. The Russians call them all Asiatics. The name in general use among the Polish exiles, with whom I was able to converse in German, was "die Wilden."

\* The most northerly race is that of the Sam'-o-yades. They extend from the Kah'-nin peninsula in Europe to the North-east Cape in Asia, occupying the land to about 300 miles from the coast, exceeding that distance at the gulfs of the Obb and the Taz, the whole of the shores of which they are said to frequent.

The Yu-raks' are not a numerous race, and occupy the district between the east shore of the gulf of the Taz and the Yen-e-say', from the Arctic circle to about 70° N. lat. They seem to me to be very nearly allied to the Sam'-o-yades, especially to the Sam'-o-yades of the Pet-chor'-a.

The Ost'-yaks are distributed immediately south of the Yu-raks', from the Arctic circle to the Pod-kah-min-a 'Tun-goosk.' They seem also to be nearly allied to the two preceding races, and to speak a dialect of Sam'-o-yade, and must not be confounded with the Ost'-yaks of the Obb, who are said to be a Finnish race.

The Dol-gahn' territory is bounded on the north by the Sam'-o-yade land about 70° N. lat., on the south by the Arctic circle, and on the west by the Yen-e-say', from which river it extends eastward 300 or 400 miles. These people are of quite a distinct race. Instead of being sallow-complexioned like the races previously mentioned, they are more copper-coloured, and if we may judge by the taste they display in ornamenting their dresses with beads, more civilised. From their language, and especially their numerals, we may infer their close relationship to the Tatars of Western Siberia and Eastern Russia, and also to the Turks. They must however, have separated from these nations before the latter became Muhammadan. They are said to possess calendars, made of wood or mammoth ivory, hexagonal and tapering slightly from the centre to each end. On these the days and months are marked, with signs for the Russian holydays. There are other signs upon them, said not to be Russian, but to resemble Runic characters. Their nearest relations are said to be the Yah-kuts', a race which we did not meet with, but who, we were told, occupy the district watered by the Kat-an-gar' river from 70° to 73° N. lat. Whether these Yah-kuts' are of the same race as those inhabiting the valley of the Lay-na (Lena) I am unable to say.

The Tun-goosks' occupy the districts on the east bank of the



Yen-e-say', drained by the Nizh'-ni Tun-goosk' and the Pod-kah'-min-a Tun-goosk'. They are also a copper-coloured race, but of a very low type of feature. I was told that their language is also nearly allied to that of the Dol-ghan'. If this information is correct, they are probably a different race to the Tun-goosks' of the Lay'-na.

Part of these tribes have been nominally converted to Christianity, but by far the greater portions prefer the purer faith of their ancestors to the fetishism of the illiterate Russian peasant. Like the North American Indians, they believe in a Great Spirit, and have vague notions of happy hunting-grounds beyond the grave. They do not bury the dead, but lay them out on the "tundra" or in the forest, in their best furs, with their bows and arrows and a supply of food. Their favourite reindeer is also slaughtered and placed by their side, so that they may not arrive in the next world altogether unprovided for. They have a semi-fetishism of their own. Each family has a collection of household gods, but these are used for divination and not for worship. These images are carried on a sledge set apart for their use alone, drawn by reindeer reserved for this purpose only, and they are covered by a clean reindeer skin, *i.e.* one upon which man has never slept. The diviner is called a Sham'-man, and represents the medicine-man of the North American Indians. His dress is hung round with scores of pieces of iron, sometimes rudely fashioned into the shapes of animals or fishes. The Sham'-man arranges the household gods on the sledge, whilst the people stand in a circle round him. They then begin to dance round until they and the Sham'-man become excited, the latter getting into a state bordering upon frenzy, and sometimes foaming at the mouth. In this state he is supposed to exercise supernatural influence upon the sick, or upon the weather, or to give supernatural information respecting lost reindeer, or productive hunting or fishing grounds.

The Siberian "tundra" is something like the fields of Lapland, something like a Scotch moor or an Irish bog. It is a wild undulating extent of country, full of rivers, lakes and swamps, stony but not rocky, gay with brilliant wild flowers, abounding with ground fruits, such as crowberry, cranberry, cloudberry and Arctic strawberry, and swarming with clouds of mosquitoes. The hill tops are barren and stony, but the valleys shelter dwarf willows and stunted birch.

These "tundras" are evidently rising gradually. Ancient drift-wood, rotted into tinder, is often found above the present limit of the highest floods, and at Gol-cheek'-a I found large heaps of recent sea-shells, at least 4 miles from the river-bank, and 500 feet above

the level of the sea. At Doo-din'-ka I saw excellent coal and copper ore, the latter said to analyse from 5 to 10 per cent. of copper, which had been brought down in considerable quantity from the "tundra." The river abounds in fish: sturgeons, sterlet, nyelma or white salmon, and other excellent kinds, and at Gol-cheek'-a we saw hundreds of *beluga* or white whale. The principal trade, which will no doubt some day be carried on between this country and Siberia, *via* the Kara Sea, will not be in Arctic products, but in the unlimited produce of South Siberia, which can so easily be floated down the Yen-e-say' and the Obb to some port which may be selected near the mouths of one of those rivers. To attempt to take a steamer to one of these rivers on speculation, with the chance of picking up a cargo, is simply throwing away money. The duration of open way in the Kara Sea is too short to admit of the ascent of either river to any town where a cargo can be obtained. The appearance of any vessel at such towns would raise the value of produce to famine prices, and the navigation of the rivers is too dangerous for ships drawing depth of water sufficient to be seaworthy.

A responsible agent must reside in the country; for the Yen-e-say' at Yen-e-saisk the emporium of the gold mining district, and for the Obb at Tyu-main', within easy reach of the great fair at Eer-beet' (Irbyt), and he must himself accompany the cargo down to the port, where storehouses must be built for the safe wintering of any cargo that the steamers are obliged to leave behind.

The present port of Gol-cheek'-a on the Yen-e-say' is entirely unsuitable. The sand banks at the mouth of the little river of Gol-cheek'-a increase every year, and this harbour will probably soon have to be deserted. No ship drawing more than 5 feet of water ought to venture there, and then only with great care, for the channel is a very tortuous one, and continually becoming shallower. A colossal fortune awaits the adventurer, who is backed by sufficient capital, and a properly-organized staff, to carry on a trade between this country and Siberia, *via* the Kara Sea, provided always that he combines British pluck with German "Grundlichkeit."

On the 23rd of July I left Gol-cheek'-a in the last Russian steamer up the river, and reached Yen-e-saisk' on the 14th of August. After a few days' delay I drove across country to Tomsk, stopping a day or two in Kras-no-yarsk'. In Tomsk I found an excellent iron steamer, in which I sailed down the River Tom into the Obb, down which we steamed to its junction with the Eer'-tish, up which we proceeded until we entered the Tob-ol', and afterwards steamed up the Too'-ra to Tyu-main', a



distance by water of 2200 miles. From Tyu-main' I drove through Ekaterenburg across the Urals to Perm, where I took my passage on board the *Sam-o-lot*, or self-flyer, down the Kama, and up the Volga, to Nishni-Novgorod. In St. Petersburg I spent a week, and reached London on the 9th of October, bringing with me more than a thousand skins of birds, about five hundred eggs, and a cart-load of native costumes and other ethnological curiosities. I everywhere met with the greatest kindness and courtesy, and am very much indebted to friends, too numerous to mention, who assisted me in many ways during my adventurous journey of more than 15,000 miles.

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II.—*The Geographical and Economic Features of the Transvaal, the New British Dependency in South Africa.* By F. B. FYNNEY, Esq.

[Read, January 14th, 1878.]

OUR new colony, the Transvaal, came into our possession on the 12th of April last. On that day the whole of the territory known as the South African Republic was formally taken over by the British Government, by proclamation of Her Majesty's Special Commissioner, Sir Theophilus Shepstone. The necessity for this act is unanswerably set forth in the proclamation itself, and whatever I have to say in explanation of the proceeding will be directly drawn from the words of that important document.

The history of the South African Republic dates back to February, 1858. But the Transvaal has a longer history by some six years. On the 12th day of January, 1852, two Commissioners appointed by Her Majesty's Government met at the Sand River, and conferred with a deputation representing the Dutch farmers who had emigrated across the Vaal River from the Cape and Natal colonies.

This Conference resulted in Her Majesty's Commissioners guaranteeing "in the fullest manner, on the part of the British Government, to the emigrant farmers north of the Vaal River, the right to manage their own affairs, and to govern themselves according to their own laws, without any interference on the part of the English Government."

Six years after this Convention of Sand River, viz. February 1858, the emigrant farmers framed a constitution, and formed themselves into a distinct government, under the style of the South African Republic. The central law of the constitution,

or the "fundamental law," as the farmers called it, was that "the people will admit of no equality of persons of colour with white inhabitants, either in Church or State." The outworking of this law was that the native had no legal status, and was recognised only as a kind of animal; and too often was the subject of oppression and injustice. This naturally engendered a deep animosity towards the Boers in the minds of the natives, and ever since 1864 the Republican Government has been harassed by the rebellious spirit of the natives.

In the early part of 1876, the Makatees Chief, Sicocoeni, who was dwelling within the Transvaal frontier, with all his tribe, openly rebelled against the authority of the Government. The war which ensued exhausted all the resources of the Republic, and left the native victorious, thus striking a dangerous blow at the prestige of European power, and jeopardising every European community in South Africa. It became absolutely necessary upon this ground for England to interfere.

The emigrant farmers in 1852 were actually subjects of England, who craved and obtained permission to settle in the country beyond the Vaal River, or, as Sir Theophilus Shepstone has put it, they were "children who obtained leave to live next door to their parents, but having managed to set their house on fire, obliged their parent in the next house, for his own sake, to put the fire out, and to take measures to prevent recurrence of the danger."

The territory thus acquired is of no mean size: it is more than twice as large as England and Wales, and as large as Great Britain and Ireland, having an area of 120,000 square miles, and lies between 22° and 28 s. lat., 25° and 32° E. long. The present population is estimated at 290,009 souls, viz., 40,000 whites and 250,000 natives. The natives I consider as under-estimated in the numbers thus generally adopted: 300,000 would be nearer the mark, and I base this opinion upon actual observation of my own, made while traversing the country in 1875.

The latitude would confer an actually tropical climate, but for the fact that the whole country is table-land, elevated from 2000 to 8000 feet above sea-level. The two circumstances of the elevation and the position in latitude so blend together as to form a happy mingling of the tropical and temperate climates. The 'Times,' already quoted, speaking of the Transvaal, says, "It has a climate probably the finest in the world, and one in which the English race need not fear to degenerate." And this opinion I fully endorse.

The Transvaal is divided by nature into three divisions, viz., the High, Middle, and Low Veldt. The High Veldt may be



said to begin at the Vaal River (the southern boundary of the Transvaal), and to embrace all the territory between that river and the first Magalisberg range; extending to the Hart River on the west, the Drakensberg on the east; and, passing up to the 25th line of latitude, taking in New Scotland, Nazareth, and Leydenburg. It extends over 35,000 square miles. Most of this area is grazing country, having an elevation of from 3000 to 8000 feet, being well watered, and having a fine bracing climate, very dry in winter; and though cold, still not unpleasantly so.

This country is best adapted for the raising of stock, but agricultural pursuits may also be followed in combination with stock-farming; as wheat, oats, and other products do well. Coal, iron, and other minerals, are found here.

The Middle Veldt contains about 25,000 square miles, and consists of the spurs and slopes of the different mountain-ranges. The broken character of this country gives a very picturesque appearance to the scenery. The ravines and gulleys form mountain-streams during the summer, are generally well wooded, and the flat spots at the base of these ranges offer great advantage for cereal cultivation, on account of the facilities for irrigation. Cattle and sheep do well, especially during the winter months, as the grass here retains its sweetness when that on the higher land is dry. Horses, up to the present, have not been found to thrive, but, no doubt, as the country becomes more thickly populated, this drawback will be removed, in consequence of the greater care and attention bestowed upon the animals.

The Middle Veldt includes part of the rich district of Marico, and what has been aptly termed "the Garden of the Transvaal," namely, the Rustenburg district.

The last great natural division, the "Low Veldt," or Bush country, is the largest of all the three, being upwards of 60,000 square miles in extent. Its elevation is but from 2000 to 4000 feet above sea-level, and it lies principally in the northern parts of the Transvaal. Consequently, its tropical situation in latitude, and its lower elevation, combine to render its climate much hotter than that of the other two divisions. Still, the elasticity of the atmosphere, together with its dryness, make it pleasant and healthy in the higher parts. Nothing can be found in either Italy or the southern parts of Europe to excel some parts of the Waterberg. Certain portions of this division adjoining the river-beds and swampy localities are unhealthy all the year round, but principally during the spring and autumn months. Large tracts of country in this part are suitable for plantation-work, and are also known to be rich in mineral wealth.

The three broad districts which have been thus described are divided, for purposes of economy and government, into counties, which are thirteen in number, viz.: Potchefstroom, Bloemhoff, Marico, Rustenburg, Waterburg, Zoutpansburg, Pretoria, Middelburg, Leydenburg, Leydenburg Gold-Fields, Heidelberg, Wakkerstroom, and Utrecht. Each of these counties has characteristics and capabilities of its own, which are deserving of special notice. The county of Potchefstroom lies within the High Veldt. It has an elevation of from 4000 to 6000 feet, and is well settled: large numbers of Englishmen, among others, who have retired from the Diamond Fields and purchased farms there. It is a splendid sheep-country, and the production of wool is rapidly increasing each year. The whole district may be characterised as of limestone formation. It has only one town of any size, viz., Potchefstroom, which is situated on the Momooi (or "beautiful river"). This river issues from large limestone caverns, about 18 miles to the north of the town. These caverns have been named the "Wonder-Source," or "Wonder-Fontein" by the Boers, on account of the river.

It may not be uninteresting to state that these caverns are of as yet undetermined length, and are ornamented by numerous and beautiful stalactites. The river is popularly supposed to have a subterranean course for many hundreds of miles; at all events, its sources have not yet been traced. Some colour to this hypothesis is given by the stream rushing with great force and volume through these caverns, and by fish found near the mouth having only rudimentary eyes.

Bloemhoff, the next district on the list of counties, needs but little notice. Its general characteristics are those of the neighbouring Diamond-Fields at Kimberley, and diamonds have been found in it, though not in paying quantities. Sheep, however, do well in the district, and the little town of Bloemhoff, which is only a few years old, is increasing its trade each year.

Marico, which will be noticed on the map as lying on the western borders of the Transvaal, is rich in minerals of different kinds. A lead-mine is now being worked with very good results, the ore containing a good percentage of silver. It is partially bounded on the west by the Natiwani River, and on that side touches the country of the Bamangwato, Bangwaketsi, and Baralong tribes. A considerable portion of this country falls within the line of frontier fixed by the Keate Award. The Bakathla tribe inhabit a part of the northern Bush section. The southern portion comes within the High country, and the northern in the Low Veldt or Bush country.

Wheat, mealie (maize), oats, barley, and other cereals; tobacco, indigo, coffee, and sugar; the vine and orange do well. Stock



may also be bred in many parts of it. Beautiful slate slabs and good building-stone abound. A thriving trade is done in Zeerust, the chief town, and as it is on one of the main roads to the interior, this will form a capital station for interior produce.

Rustenburg is one of the western midland districts. The Magalisberg mountain-range traverses the southern part of it, giving rise to the western sources of the Limpopo. Rustenburg possesses great differences of climate, and its productive capabilities are exceedingly varied: the southern sides of the Magalisberg being adapted for stock, while on the northern side tropical cultivation can be successfully carried on. Copper is widely distributed in the middle region, and in the northern parts large game still abound. On account of its varied climate and productive capabilities, Rustenburg, as I have already mentioned, has been styled "the Garden of the Transvaal."

Waterberg, lying as it does on the north-western parts of the Transvaal, has an interest of its own, on account of the beautiful scenery to be found within its limits. The fine ranges of the Waterberg and Hanglip Mountains cut through its very centre from east to west. There is, however, another reason which confers upon this district an especially historical interest.

On the central eastern borders will be noticed a spot marked on the maps as Potgieter's Rest, and which indicates the site of what was once a town of that name. This town was situated in Makapan's Poort, a gap in a mountain-range of great beauty; but it had to be abandoned from two causes—the working of the "fundamental law" and fever. In the sides of the mountain, close by, are caves 2000 feet in length, and between 300 and 500 feet wide, intersected within by walls. In these caves almost the whole of a large tribe was starved to death by the Boers, in retaliation for their Chief Makapan having killed a Boer, named Hermanus Potgieter, and his family. The bodies of upwards of 900 starved wretches were found some time after the terrible tragedy outside the cave's mouth, and as many more are supposed to have been contained within the cave. These mountains are of limestone formation.

To the north of Potgieter's Rest, and about 4 miles, is a conical-shaped mountain, known as the Yzerberg, or Iron Mountain, which is one mass of iron ore, quarried for ages past by the natives. It is commonly asserted that Yzerberg affects the compass for a radius of 10 miles. Vast ranges of granite, intersected by quartz seams, abound in this district. The town of this district is Nylstroom, or Nile Stream, so called on account of the pilgrim Boers imagining that they had reached the sources of the Nile.

Zoutpansburg forms with Waterberg the northern boundary

of the State, lying to the north-east. The chief town is Marabastadt, near which a rich quartz gold-reef has been worked for the last four years, at a farm called Ersterling. Standing on the highest point of Ersterling, which, according to the late Thomas Baines, is 5600 feet above sea-level, and looking towards the east, the eye catches the noble range of mountains, named after the late President of this Society, Sir Roderick Murchison, which before long will be found to be rich in many kinds of minerals. Many parts of this district, as well as Waterberg, are infested with the tsetse-fly; but there is scarcely need to attach so much importance to this fact as is commonly done, because the fly is merely a temporary and ephemeral scourge, and always disappears with the large game.

Many parts, which six years ago were known as Fly country, are now entirely free, and therefore it may be fairly hoped that the extinction of this pest is only a matter of time. On the extreme north of this county is the Zoutpansberg range of mountains, which have given the name to the district. They have an elevation in some places of at least 8000 feet, and almost every variety of climate is to be found upon and around them. This range, which is a continuation of the Drakensberg, runs directly east and west, and is composed of sandstone and red granite. Near the junction of the "Blauberg" with this range, there is a huge salt-pan, or Zout Pann, which gives the name of the range of mountains.

It is near this salt-pan that Schoemansdal, the former capital of the Zoutpansburg district, was situated. In the year 1875 I drove through the ruins of this town by moonlight. I shall never forget the feelings I experienced. I had just been hearing from Makato the story of its destruction and the reason.

The district of Pretoria, the central one of the Transvaal, has within itself High Veldt, Middle Veldt, and Low Veldt, and, like Rustenburg, therefore, its agricultural resources are varied. This district is remarkable for three ranges of mountains which intersect it, running from east to west. Pretoria, the capital of this district, is also the capital of the Transvaal and the seat of Government. It is beautifully situated in a broad valley, between two of the lines of the Magalisberg range. It is rich in minerals, and well suited for stock breeding and agriculture.

Middleburg, Heidelberg, and Wakkerstroom may for the present be passed over, with the remark that they are in the High Veldt, are well watered, suitable for grazing and agriculture, and contain great wealth in coal, iron, and other minerals.

Leydenburg and the Leydenburg Gold-Fields stand next in the range of districts, and will some day acquire for themselves a larger attention than they have yet received. Leydenburg is



unrivalled as a wheat-producing country, and may be looked upon with confidence as a very large and important source of future supply.

The Gold-Fields have been opened for about four years; but the feeble Government under which they have hitherto existed has precluded all chance of their development, and for the last eighteen months they have almost been closed, owing to the war with Sicocoeni, now happily over. Still, with all these drawbacks, they have continued to be worked to some extent.

The latest Government Returns, which are for the year ending December 1875, show that the Natal Bank exported in that year over 36,000*l.* worth of gold, and the Cape Commercial Bank's exports for the same period exceeded 70,000*l.* It is estimated also that at least 100,000*l.* worth more reached England through private hands. The Union steam-ship *German*, last voyage, brought home gold-dust valued at 17,000*l.* So that there is fair ground for considering them payable.

Utrecht, the remaining division or county, forms the south-eastern corner of the Transvaal, and, as the crow flies, is only 100 miles from Durban, the seaport of Natal. It is bounded on the east by Zulu-land, and part of this district is claimed by Cetywayo, the King of the Zulus, who has, according to the latest accounts, built a military kraal. It may be as well to state, however, that Cetywayo has really no right on the land in question, and the claim put forward is simply the outcome of his inordinate ambition, and of the weak and tampering policy of the late Government.

Its capital, Utrecht, stands about 30 miles from Newcastle, the most northern town of Natal. In this district there are many known coal-seams, one close to the town 7 feet thick. The whole district is well suited for all classes of farming. There is a prosperous future before Utrecht as soon as our Government has secured for it the blessings of peace.

The Transvaal, which I have thus briefly described, is a country capable of great things; but it has for the last nineteen years been kept back from development by the mistaken policy and "inherent" weakness of the Government under which it existed. It must never be overlooked that in assuming the charge of this land our Government has received from the late Republic a heritage of financial, political, and social difficulties of no mean character, and that the overcoming of these difficulties must, under any circumstances, be a matter of time. Nevertheless, it is my firm belief that these difficulties will all be conquered, and that the Transvaal will, in a very short time, emerge from the gloom of adversity and misrule into the sunshine of prosperity and order. The annexation of this great

and promising country will not only bring blessing to every inhabitant of the land, but will also reflect honour and credit upon the master-minds that have conceived and effected the bold but wise design.

The natives residing within the borders of the Transvaal are chiefly of the different Makatees tribes, a people unlike the Zulus. They are peacefully disposed, docile, and fond of hunting: both men and women cultivate their land, a thing very unusual amongst the natives of Southern Africa. They show a great aptitude in adopting the dress and customs of the white man; and the abundant testimony of the missionaries stationed amongst them speaks for itself as to their desire to accept the Gospel.

It may naturally be asked, What is the feeling of the native tribes with respect to the annexation? I cannot, perhaps, answer this question better than by saying, that on the occasion of the hoisting of the British Flag in Pretoria, native chiefs from far and near either attended themselves or sent their representatives to welcome the raising of that emblem of *justice* and *freedom*.

In concluding this brief sketch of the Transvaal, I especially desire to draw attention to the certain result of the recent annexation of this interesting territory to the dominion of England. Its influence upon the yet barbarous native tribes, the reversal of the selfish and blind policy of the Dutch pioneers of the country, which was based upon the degradation and serfdom of the aboriginal owners of the soil, are very momentous facts, and cannot be too highly estimated by those who desire the spread of enlightenment and civilisation over the earth. But there is yet another consideration which addresses itself still more immediately to the appreciation and approval of the Royal Geographical Society. I allude to the effectual way in which this annexation drives the point of the civilising wedge into the very heart of the barbarism of this hitherto savage continent.

It is notorious that the Portuguese, and some other maritime nations, have failed in the work of colonisation and of reclamation of savage tribes. Their traditional course of procedure has been to occupy small isolated trading-stations upon the seashore, and to limit themselves to such intercourse with the native tribes as can be accomplished from these limited spots, which they hold, as the natives are shrewd enough to say, with the obvious intent of securing their escape whenever the land becomes too hot for their longer occupation.

The true colonising races, on the other hand, go forward boldly into the country and settle down upon the soil, intro-



ducing all their old habits of life and all their old branches of industry. The settlement of the Transvaal in this way confers also the inestimable advantage of entering the great inland region of South Africa by the natural portal. It is the mere extension onward of the base of Cape Colony and Natal, already securely held, and it not only cuts the Kaffir barbarism of the east from the Bechuana barbarism of the west, but advances by a magnificent stride far onward towards the great central lands, which have become regions of such promise and desire since the recent achievements of Livingstone, Cameron, and Stanley. The extreme northern point of the Transvaal is within 300 miles of the Victoria Falls of the Zambesi, and from above these falls the great water-way of this river stretches on towards the north-west in unimpeded flow, until its sources interlace with the head-waters of the Congo, and actually cross the central plateau where the Portuguese traders from the west meet the Arab traders from the east. It requires no large geographical insight to see that this is in reality the route by which commerce and civilisation will find their way into the strongholds of African barbarism.

This really is the interpretation of the events which are in progress in this part of the earth. Our occupation of the Transvaal is an unavoidable step in the progress of things.

The aboriginal races in these fertile and favoured lands do not die away before the white man, but actually increase with more than their ordinary rate of growth under the advantages and safeguards which he brings. It is from this remarkable fact that the great problem of African colonisation springs. What is to be the ultimate destiny of the primeval occupiers of the soil when they come into contact with the advancing wave of civilised occupation? The problem is a very interesting one, and one which affords a noble field for the exercise of the highest powers of the humanity and intelligent statesmanship that aspire to organise and lead. But whatever turn the present aspect of affairs may assume, and whatever the difficulties may be that have to be encountered and overcome, there can be no reasonable doubt as to what the final issue must be. The black races will either have to accept the civilisation and the orderly co-operation with industrious and law-abiding existence, which is offered them; or they will have to move back, before the advancing civilisation, into the remote recesses of the land, there to await the next stride of progress. As an actual fact, it will be found that the problem will solve itself in both these ways at once. Some of the native tribes will identify themselves with progress, and gratefully accept the ruling of that Fate which comes to them with the assurance of prosperity

and life, and with the accession of comfort and wealth; whilst others will move off into the wilderness, and there still cling to their habits of independence and indolence. But when a native race is once subdivided in this way, that unmistakably foreshadows its end. The noble savage will be swallowed up and lost in the rapid growth and the ultimate predominance of his more advantageously-placed kinsman. And black civilisation will finally swallow up the fragments of barbarism which for a time have escaped that fate.

III.—*Third and Fourth Journeys in Gaza, or Southern Mozambique, 1873 to 1874, and 1874 to 1875.* By ST. VINCENT ERSKINE.

[Read January 28th, 1878.]

*Third Journey.*

It will be remembered that upon two previous occasions I have visited Umzila's country. My first visit was purely and simply a matter of exploration, incidental to my examination of the mouth of the Limpopo. On the second occasion, I went to Umzila on a political mission.\* On the third, which I have now, in the first instance, to allude to, my immediate object was the opening up of trade, in which I enjoyed the advantage of the support of the Dutch firm of Dunlop, Mees, and Co., of Rotterdam. My principal aim in this expedition was to secure the consent of the Chief Umzila for the passage of traders and goods through his territory, which lies between Umzeligasi's country and Lake Ngami, and Sofala, and which I cannot doubt is the proper and legitimate inlet to trading operations with those parts. The route which I traversed upon this occasion is a very important track, as it is one of the main roads from the unhealthy and sterile districts of the coast to the salubrious and fertile mountainous region of the interior. My allusion to the sterile coast districts must, however, be understood to be restricted to the flat, sandy, brush-covered plains which spread outside of the alluvial deposits of the Sabi and other streams; tracts that are themselves fertile even near to the seaboard.

I left Natal, May 12th, 1873, in the barque *Sofala*; touched at Delagoa Bay, and reached Inhambane, after a long and boisterous passage, on the 6th of June.

After some preliminary difficulties, I secured a passage to Chi-

\* Vide 'Journal of the Royal Geographical Society,' vol. xlv. p. 45.



luana (Chuluwan), in company with Mr. Reuben Beningsfield, in an Arab vessel. We left Inhambane July 6th, and arrived at Chilwana July 30th. Chilwana is an island extremely low, and difficult to make, being, indeed, three-quarters of it under water at spring-tides. It has a wide channel between it and the main land, open to ships at the northern end, but only to boats at the south. The island is 9 miles long, and faces the northernmost part of the delta of the Sabi. The town stands some little distance from the north point (in lat.  $20^{\circ} 42' \text{ s.}$ ), and contains about 18 Europeans and 4000 Arabs, Moors, half-castes, and natives. There is no place in it of public accommodation, but I was hospitably entertained in it by Mr. Swart, the Governor.

There are two French merchants carrying on operations in the place; but the trading arrangements are of the most unsatisfactory kind, the traffic being in the hands of black agents, who commonly give more than the market value of the produce which they collect, and not unfrequently make away with the goods without rendering any return. The system is certainly even worse than that of the unlimited trust given to whites at Inhambane. The houses are very rude and leaky thatch-covered structures, of wattle and daub. The climate is pleasant and cool in the winter season.

Umzila's kraal at Tshamatshama, to which I was bound, lies about 135 miles in a direct line from Chilwana. The mouth of the Sabi is a few hours' sail to the south of the island, with a dangerous bar; but a large accessible creek, called Maluli, runs up into the delta opposite to the island. After due consideration, I determined upon adopting this route, and on the 13th of July started with my merchandise in a large boat of about 10 tons' burthen, and entered the creek, there about 3 miles wide, with the flowing tide, passing between mangrove-covered banks in a westerly direction. At half-past 10 in the evening I arrived at Shitembu's kraal, and then moved a mile further on to Manama's. Manama is a Mandowa under the rule of Nonxanga, the Zulu governor of this part of Umzila's territory, who dwells himself on the Sabi, not far away. The creek has no water-communication at its head, but there are several lateral channels of communication with the Sabi from its lower part. There are numerous creeks of this character in the delta, which terminate in wide expanses of sandy mud, covered by salt water during the spring tide, and by fresh water at the season of flood; and giving rise to a very remarkable production of mirage at times, in which the reflection of even moving animals is produced with marvellous clearness, so that they seem as if running along upon smooth looking-glass.

I was comfortably lodged in a double hut by Manama. The place enjoys a fertile soil, and would be admirably suited for a trading settlement, on account of its being so easily accessible from Chilwana, and of its being at the same time on the firm land, well beyond the creeks and mud of the delta, and surrounded by open grassy plains that afford good feed for stock. Water stands on the plains during the heavy rains, but soon drains off when these cease, the subsoil being an arenaceous limestone. The place is fairly supplied with trees, scattered about, the most abundant of which is the umphongoti (*Kigelia pinnata*), with great seeds hanging down like Bologna sausages. The evergreen mukooshi,—the candle, or butter, tree,—deciduous baobabs and mimosas also occur. There is likewise a notable palm, the umfuma, or umkowan, which grows to a height of 100 feet, is thicker in the middle than above and below, and has a fruit somewhat like the coco-nut in appearance, but consisting of three large seeds in a husk, which are eaten after they have been made to sprout.

The arenaceous limestone overlies a bright red sandstone on the plains. The remarkable deposits of lime become even more strongly marked along the channel of the Sabi, where bluffs of pure lime and pebbles, 100 feet high, rapidly succeed each other for from 150 to 200 miles.

Having placed my goods in store, I sent off a messenger to Nonxanga's to ask for porters to his place, and then found amusement in hunting antelopes and guinea-fowls. The natives, however, are not a pleasant race to dwell amongst. The Umgonis, or Zulu section of the community, are completely the masters of the Portuguese; they are indolent in the extreme, and subsist mainly by robbing the Tongas. The country, although fertile in itself, is consequently always in a state of approximate famine.

My bearers having arrived, I started off soon after mid-day, on August the 19th, for the Sabi, and enjoyed a pleasant walk over breezy open flats, reaching a kraal appointed for me near to Nonxanga's, after a march of 12 miles. On the following day I exchanged ceremonial visits with the chief, and arranged with him for porters to go trading with one of my men, but in company also of a Zulu of his own. It appeared, however, that no trade could be accomplished in this individual's presence, as the Tongas would have been fined immediately for the possession of ivory. My man returned in a few days with this account of his expedition. Nonxanga possesses an engaging countenance, and seems to be about 30 years of age; but he proved to be a very sharp hand at a bargain, and was unceasing in his demands for rum. The natives manifested a pertinacious



craving for this spirit, but nevertheless would not pay for it. The exchange expected for a miserable fowl was a bottle of rum. I soon found that it was to my advantage to get rid of the intoxicating drink entirely, and consequently disposed of my whole stock to a native attendant of Mr. Beningsfield.

The latitude of Nonxanga's kraal was  $21^{\circ} 2' S$ . The mornings and evenings were calm and clear, and a sea-breeze generally prevailed during the day, laden with cumulous clouds. Hyænas were numerous and bold, and I had to defend my possessions with strychnine.

The natives of this district are by no means so warlike or powerful as those of the districts around Natal, and might very soon be reduced to a state of orderly obedience if a garrison settlement were established in the interior, and a steady stream of immigration were encouraged. At present the natives look upon white men as people appointed to supply their needs, and to be robbed and ill-treated whenever this can be done with impunity. There is not a shadow of respect entertained amongst them for the Portuguese.

On the 10th of September I received four donkeys that were to follow me from Inhambane, and that had been twenty days on the road. On the 18th I sent off fifty loads of merchandise, and on the 21st started myself for Umzila's. I had seventeen carriers and thirty hunters in my company. I found the Sabi at this season not more than 18 inches deep, and 50 yards across, with a sand-bed about a mile wide. One of my donkeys was killed by an hyæna, and a second was not in a fit state to ride; but the remaining two rendered me inestimable service, and, in reality, carried me to Umzila's and back, a distance of 400 miles. They beat natives on the march, because they do not need the same amount of rest. I attribute my almost entire immunity from fever and illness upon this journey to the fact that my donkeys saved me from exhaustive exertion in the great heat. At the time I attributed my success with these animals to their having been bred upon the sea-coast of Natal, for they were well and fat upon their return to the coast. I had afterwards, unfortunately, some reason to reconsider this opinion, as they all ultimately died. The donkey, however, requires very careful handling in the matter of equipment, as he readily chafes. The crupper, breast-plate, girths, and haunch-straps should be all cased in sheep-skin, and a pad rather than a pack-saddle should be adopted.

On this journey I found that there is only one possible way in which the native Tongas can be dealt with. On arriving at a kraal I always demanded what I required, and took what I wanted, and then gave them an equivalent present when I left.

I failed entirely to get necessary supplies by any attempt at an open bargain and purchase.

Rice of a very fine quality is grown along the lower Sabi, but not in any quantity, because the Tongas are in constant dread of attracting the notice and rapacity of their Zulu oppressors. If any man in this region is successful or prosperous beyond his fellows, he is immediately credited with being in league with the evil powers, and his possessions are wrested from him upon that pretence.

Our route lay along the valley of the Sabi, until, on the 23rd, we came up with the party we had sent forward with the merchandise. We found them feasting upon fish which they caught in the river, often with their hands whilst in the act of diving. They were quite contemptuous in regard to crocodiles, catching them in the water and bringing them to land. I saw them do this with small ones, but I was assured they did the same with some of large size. The latitude of this place was  $21^{\circ} 12' \text{ s.}$

From this station we had to proceed for some distance along the bed of the river, in consequence of the encroachment of the overhanging rocky banks upon its channel, crossing and recrossing frequently in the loose sand. After this time I limited my progress to about 12 miles per day, because I found that when I exceeded this distance I could not get my men in by nightfall.

My bearers soon after this became so insubordinate and unmanageable, that I resolved to build a store for the chief bulk of my merchandise, and carry on with me at first only the King's present. I accordingly set to work, and built a three-roomed wooden shanty in about five days. I killed two hippopotami, at a neighbouring pool covered quite over with a kind of water lily, during the progress of the work. There were 87 natives at this time in my following, and they nevertheless refused to return for the meat of the second sea-cow, until I began to poison that of the first with tartar emetic, to prevent them from feasting upon it until they had brought all I required in.

After crossing the Sabi River on October 4th, the latitude of my store hut being  $21^{\circ} 17' \text{ s.}$ , I passed through a district inhabited by the Hlenga\* tribe, an offshoot of the great Makololo race. The Tongas of the district are properly Mandowas or Umyi. We here entered a country of open woods and grass, resplendent in this mid-spring season with verdure. The trees were laden with flowers, which filled the air with strong perfume. The most powerful of the fragrance came from the altogether

\* Pronounced "Thlenga."



insignificant flowers of a kind of vine called the umtshanjowa, which bears an edible fruit that is made by the natives into a blood-red wine. We soon after crossed the Upipa River, an affluent of the Gorangosi, and then traversed an open grassy country bearing ivory palms (*Phytelephas*) and abounding in game. There is here plenty of water, and the region is called "Mapanini," or the "Land of Pools." We rested at the kraal of Umtani, who is chief of the Matschongonini, or Mandanda people, kindred apparently to the Chobis, Marongwis, and Basutos. The women of this race are almost entirely unclad, but loaded with beads and red clay. One old woman, to whom I made some remark upon this point, answered me: "People do not smell, unless they cover themselves with rag. It is better to go naked." These people disfigure themselves sadly with rows of skin-lumps between their eyes and at each corner of the mouth, and file their teeth to points.

The Mandandas are dog-eaters, and keep their dogs fat and in good condition for roasting. They give as their reason for the adoption of this practice that the Zulus will not eat dogs but do eat goats; and they say that if they kept goats instead of dogs, they would soon be deprived of them by their oppressors, and that hence "dogs are their goats." These tribes also eat rats as well as dogs, and are abundantly supplied with them. Fowls have long since disappeared from amongst them.

My next stopping-place was the kraal of Ishoppa, an old friend, who gave me a cordial welcome, and feasted me with goat's flesh, corn, and Kafir beer. When I went on from his place, after a full day's rest, he sent on fifteen women with water-pots for my use, as we had some distance to traverse where there was no water.

We soon afterwards entered a country of dense bush, which is called "Magwasha." It is inhabited by Mandandas, under the chieftainship of Umgupe, a direct descendant of the original Tonga king. The occupation by the Mandanda is, however, contested by the ants, which are in incredible swarms everywhere, both white and red. The white ants destroy the trees, and the red ants feed upon the white. The original vegetation of the land seems, indeed, in process of being exterminated by the ants—a young tree of any kind is scarcely to be seen. The Mandandas build their huts in the dense bush, and away from water, to elude the visits of the Zulus, and perhaps also for the advantage of a richer soil for their gardens. At any rate, the bush serves them for an unassailable retreat in case of need. They themselves have an inconceivable instinct for penetrating its leafy fastnesses. The women make a flax-like fibre out of a weed, twisting it into a string by passing it between the

hand and the thigh, and then weave this into ornamental coverings.

On the 9th of October I crossed one of my old routes in  $20^{\circ} 56' \text{ s.}$ , and beyond the Umkoni River, an affluent of the Upipa, the bush became more open, with a rich chocolate-coloured soil. The Umkoni River was here about 780 feet above the sea. The belt of bush expands and contracts as it runs along the base of the mountains, separating them from the higher plains. By the Mapanini road it is reduced almost to nothing. On passing out of the bush, near the head-waters of the Umkoni, we stopped at the kraal of Mashadsi, Umgupi's younger brother, who, although a Tonga, collects tribute for Umzila.

From Mashadsi's kraal we proceeded on through an arid, sandy, and uninhabited tract to Malumelila's place, which we found to be in  $20^{\circ} 42' \text{ s.}$ , and about 1250 feet above the sea. The ascent thus far is, however, quite imperceptible to the senses, on account of the very gradual nature of the slope. The culmination of the ascent is about 95 miles from the sea, and the water beyond collects into rivers which have outlets some distance away from the Sabi, the principal one being the Gorongosi, whose sources are almost completely encircled by the Sabi and Bosi. The Gorongosi is navigable for boats some 20 miles from its mouth.

At Longoneli's kraal we found the chief had recently been making some practical experiments with damaged gunpowder and a fire-stick, which had ended in blowing the experimenter up. In the neighbourhood of this kraal there was a large tract of country with a rich black soil, whose fertility was due to the presence of volcanic rocks, which were seen rising into small isolated hills. The higher mountains were now distinctly in view, lifting their sombre purple outline from a dense covering of forest. The Gugoya Mountain rose in the form of a hog's back about 900 feet above the plain towards the N.N.W., with the Umtschensi River at its base, running towards the Bosi. This river was reached in the early morning of the 12th. The stream was rapid, with a breadth of 120 feet, and a pebbly bed, about 2 feet deep, and with steep banks 100 feet high. I found the drift of the river to be not more than 460 feet above the sea, and must therefore have descended some 800 feet to reach it. We now traversed the rocky, hilly, and forest-covered district of Umtonto. The rock was here principally greenstone porphyry, with quartz gravel and quartz bands, and was very suggestive of auriferous deposits. We next climbed a ridge of loose porphyritic rocks, capped with sandstone. Thus far the track had been quite accessible for waggons; but beyond this no waggon could have passed. The country was now a succession



of hills, valleys, and streams, with a red clay-soil and porphyritic rocks. At Umkontwain we came to the kraal of Kater, who is a brother of Umzila, and were there hospitably entertained. On the 14th of October we traversed some mountainous districts, and descended suddenly by a steep precipitous path to the Bosi, then crossed another mountainous spur and descended gradually into the valley of the Utschiredsi, an affluent of the Bosi, and then climbed along its course to the plateau, about 3000 feet above the sea. I here soon reached the path I had traversed in 1871, and at the Gauda kraal found a familiar friend in the form of a venerable lemon-tree, which had rendered me good service upon that occasion.

On the 16th of October Umzila's Indunas came down to me with an invitation to visit the King. On the following day I found him at one of the royal gardens, where he was celebrating the opening of the hunting season by a kind of public ceremonial. He gave me a friendly reception, and proposed that I should bring up my goods to his kraal. This I for the present declined, until I better understood upon what footing we were likely to stand. I wanted to get leave to pass on to Umzeligasi's territory, but found there was war with that chief, and that Umzila was jealous, and adverse to any trade communication passing on to him. Lobengula, who had succeeded Umzeligasi in the sovereign sway over the Matshoban, is as friendly and accessible to the white people as Umzila is the reverse, and would certainly open his country if the latter chief were out of the way. Umzila avowedly aims at keeping the gold produce of Manica to himself. He refused me permission to visit the fields, and told me that when his ivory was done, he intended to work then for his own benefit. He is afraid of the Dutch of the Transvaal Republic, but not of the English, because he thinks that Cetywayo serves as an effectual shield between them and himself. He is quite aware of the power of "Inyanisi," as the Queen is called, but thinks she is too far away to do him any harm. There can be no doubt, however, that he is by no means himself a powerful chief. His authority would already have crumbled away if the Portuguese had established a fortified camp in the neighbourhood of his kraal. As it is, the natives of Gaza hold the Portuguese in the utmost contempt, and say that they keep near the sea in order that they may be able to run away easily. These people entirely understand the meaning of the concentration of power. The Portuguese have so scattered their forces at insignificant stations along the coast, that they are quite incapable of rule. The climate is eminently healthy and cool in these upper regions, and well suited to cattle, and to the cultivation of wheat and the vine. Cotton,

sugar, and coffee also thrive in the deeper and warmer valleys. It is much to be regretted that the Portuguese have not a well-ordered province from Delagoa Bay to the Zambesi, divided into subordinate governments, with its sea-gate at Sofala. The Zambesi itself would be more easily approached in this course than along its own water channel.

Soon after my arrival at Umzila's place the rainy season began. The rain sets in with a driving mist from the east and s.s.e., which is shortly followed by thunder and lightning, and rain then falls for two or three days. Northerly and westerly winds restore the fine weather.

There are fine forests of hard wood on the slopes of the Silinda and Sipunyambili Mountains. The trees are 4 feet in diameter and 60 feet high, with trunks as straight as pines. Elephants, buffaloes, and antelopes abound. Both the eland and the sable-antelope may be shot. I saw three lions, but failed to bag them.

Umzila has about a thousand head of cattle at his kraal, which have been, for the most part, plundered from the Amadumas. There are, however, amongst them cattle that unquestionably came from Zoutpansberg in the Transvaal, many years ago. There seems to be no tsetse fly, excepting in the neighbourhood of the Sabi. I procured exactly the same latitude for this kraal that I did upon my former visit, namely,  $20^{\circ} 22' 30''$  s., and consider it to be about 180 miles in a direct line from Zoutpansberg in the Transvaal. Some lunar distances which I was enabled to secure I have sent on to the Royal Observatory at the Cape, for examination and reduction.

The influence of Umzila amongst the native tribes is mainly dependent upon a reputation he possesses of having some powerful wizards in his service, who fight with diseases and the elements, instead of with arms. He is very much feared by the surrounding barbarous chiefs, on this ground.

I was detained by Umzila by false promises and under various pretences for nearly two months. He then gave me eight tusks of ivory, with permission to hunt in the lower district of Mazibbi, but would not allow me to go on towards the Matschoban country. I accordingly commenced my return to the Sabi on the 9th of December. On reaching it upon the 15th, I found the river almost impassable from flood, but ultimately succeeded in getting my donkeys across. On reaching my hut I found everything safe, and now turned my attention to trade. Nothing, however, was brought to me for purchase, and no doubt the situation of my huts was unsuitable for the establishment of traffic.



On the 24th of December I started for a visit to the Zulu governor of the Tonga district, extending up the river some 20 miles above. The thermometer at this time frequently marked 102° and 104° in the shade. On the following day I was hospitably received by Singyingu, and feasted with goat's flesh and beer. He also gave me a tusk of ivory. The river was alternately in a state of rising and falling, according to the floods which it received in the mountains. As it rises, small flakes of foam first appear, then larger ones, and, finally, floating reeds and fragments of huts. The larger flakes of foam always indicate that the river is impassable on foot. At this period the river is quite navigable by boats that would draw as much as 3 feet of water, but the current is too fierce to be stemmed by any power short of steam. Singyingu's kraal was the highest point of the Sabi that I reached, and was estimated as being about 21° 28' s., from my dead reckoning. I returned to my hut by a stiff and very long day's march on the 29th.

In better hands a steam float might be used for purposes of trade upon this river. But, under the circumstance of the rapacious presence of the Umgonis, or renegade Zulus, who are now dominant over the Tongas, nothing of the kind would be possible, as no produce could be obtained. "Dug-out" canoes came up for me, against the current, upon this occasion, as far as Singyingu's, but only arrived after I had started on my way down.

The thermometer on the shady side of my hut often rose to 105°, and the coldest temperature of the night at such times was 74°. The Sabi here frequently rose and fell in its channel, although the ground remained parched and baked, for want of rain. I acquired quite a high reputation as a rain-maker, because it frequently happened that it rained upon my arrival at kraals. An old chief, called Sondaba, once brought me a present of some corn and three fowls, and asked me to make him some rain. I told him that his offering was too small, and that he must bring me a goat before I could accede to his request. He had scarcely left, however, when a thunderstorm broke, and deluged the place with rain for three days. I suppose I was held to have relented on his behalf.

I now found that there was no profitable trade to be established at my hut, on account of the paralyzing fear of the rapacious Zulus which was over the people. I accordingly came to the conclusion to get rid of the main stock of my goods in whatever way I could. When I had done my best, there, however, still remained about 40 loads to get transported down the river. I started to accomplish this on the 9th of January, 1874. The

streams were all inconveniently high. We marched from 12 to 14 miles a day, and often had to go knee-deep in water. On the 14th of January we reached Mazitu's, the Zulu overseer of the district. As he was absent, I had to wait until his return. His kraal was about 8 hours' walk, or 20 miles from the sea. Singyingu's kraal was 76 miles from the sea, and in 1872 I crossed the river 60 miles higher up, in  $21^{\circ} 27'$  s., about 15 miles below the confluence of the Lumdi with the Sabi, probably about  $21^{\circ} 26'$  s.,  $32^{\circ} 18'$  E. longitude, and 150 miles from the sea.

On the 17th of January the Sabi became brimful, a mile and a half across, and deep enough to float a hundred-ton vessel. The current was muddy and like a mill race, covering islands, trees, and reeds, and presenting the appearance of a rolling expanse of brown water. I went some distance down the rapid river in a canoe, to join Mr. Benningfield; and we then arranged to go on together to Chilwana. We had, however, to seize a canoe before we could get any native to go with us. We paid two eight-yard pieces of blue baftas for the passage, and launched upon the stream on the 18th of January. We flew along at a terrible pace on the rapid current, with constant danger to the canoe from half-submerged trees. We turned aside into a creek to rest at Manyati's kraal. In one place we had to seize a hostage of women, whom we found hid in a tidal creek, to induce one of the men to go on with us as a guide. We finally reached the coast at a break-neck pace, turning out of the Sabi by a side creek called Macowa, nearly opposite to Maliki's place. We now paddled through a series of in-shore creeks and lagoons, at one place passing a very dangerous gap in the sand-dune, through which heavy sea-breakers tumbled in. We had here to unload the boat before we could venture upon the passage. This dangerous outlet is well known to the natives, and is called by them "Umperta." This lagoon route is traversed by traders. We again passed along through mangrove-fringed creeks, and crossed one lagoon, about 4 miles wide, availing ourselves of the drift of the tide. The mangrove-roots stand up, like the rafters of a miniature round-house, out of the water. The tide rises in these creeks about 18 feet, but there is generally shoal water where the creek passes into a lagoon. There is often a reflux current, on account of the tide entering some stretch of creek at both ends. Our last halting-place was at a spot called "Shimilimili," amongst the mangroves, where the mosquitoes bit through a flannel shirt and thick moleskin trousers. The entrance to this place was appropriately called Umbarba, or "biting." We started from this



wretched place an hour after midnight, and soon after entered the Maluli creek, by which I had passed up to Shitembe's, and about 10 o'clock on the 22nd of January reached Chilwana. Altogether I traversed about 100 miles in the "dug-out" canoe, through the mangrove swamps of the delta of the Sabi. I found very melancholy news awaiting me at Chilwana. I there, for the first time, heard of my brother Robert's death, who had been killed in the brush with Langalibalele's people, in their escape with their cattle through the pass of the Drakenberg frontier of Natal.

I still had to get my ivory down the Sabi. I first went up to Nonxanga's by the old route, and then returned to Chilwana to arrange for a boat. At this time in the prosecution of my negotiations I made one trip to Shitembe's, in which the whole route was under water, and in which I swam ten considerable streams with rapid currents. Every landmark had been effaced by the flood, and I had to guide myself entirely by the compass.

Through the kindness of the Governor I was now enabled to attempt to visit the mouth of the Sabi by sea, in a boat which he provided for me. I entered one of the mouths of the great river, called "Macow," and found 6 feet of water in the channel, with a stream of water that drifted the boat 4 miles out from the land, and at that distance was still fresh enough to make excellent tea. The fresh-water current was clear and green, with floating mosses, rushes, and reeds in it. We managed, by tacking across the current within the banks, and by the use of the tow rope, to reach within a couple of miles, or so, of the main channel of the Sabi. We here got a night's shelter, by swimming to the kraal of Inyansiva, pitched upon an island in the watery waste. I crossed the flooded country for some distance in a canoe to Matiki's place, and there loaded it, and a second canoe which I pressed into my service, with the ivory that I had left in Matiki's charge. We slept in our boat, after we had re-crossed to Inyansiva's, on account of the flooded state of the land, and on the following day again traversed the Macow lagoon, once touching the bottom, and having to leap overboard to hold the boat up from being capsized by the current, and, passing out to the sea, made a fair-wind passage to Chilwana. The water in the harbour was perfectly fresh when we arrived, in consequence of the enormity of the land-flow.

From Inyansiva's I could distinctly see the true mouth of the Sabi, about 8 miles away, and bearing, by the compass, s. 70 E.

I now made another visit to Nonxanga's on the Sabi, leaving

Chilwana on the 23rd of February, and returning to it on the 27th.

On the 8th of March I started for as much examination as I could get of the Gorongosi mouth. The common maps of this region are quite incorrect. The Admiralty chart shows a place between Chilwana and Sofala, marked "Boene." The river which falls into the sea there is, however, really the "Gorongosi." It does not go to Sofala Bay, as it is made to do in the maps. Boene is an island in the delta, and was formerly a Moorish settlement, and still has a clump of coconut-palms planted by its old masters. It affords a good safe harbour for small vessels, and is a favourite place for landing. It has a somewhat notable exportation of bees'-wax, as the bees seem greatly to affect the mangroves in the delta. I entered the mouth of the river, and secured observations on the western point of Boene, which I found to be in lat.  $20^{\circ} 28' \text{ s.}$  The entire coast in this region abounds in fine harbours, which contrast singularly with the poverty of the English possessions in this particular. My sketch-map shows quite a long series of creek and river embouchures, beginning from the Inyambesi, the farthest towards the south. The Donde comes next, then the Inyambungu, twenty-four distinct mouths of the Gorongosi, the main channel of that river; the Malaya; other unnamed mouths; the Inyatshisi; and, finally, the Macocoa, which trends some distance along the coast, it is said almost to Sofala.

I returned to Chilwana on the 20th of February, and had now determined to make my way by a boat as far as Cape San Sebastian, and to cross overland thence to Inhambane. In accordance with this plan, I sailed in a launch for Bazaruta on the 30th of March. I passed the mouth of the Sabi at noon, and secured an observation 6 miles off the mouth, which gave me  $20^{\circ} 53' \text{ s.}$  for latitude, or  $20^{\circ} 58' \text{ s.}$  for the place of the mouth. It is consequently 33 miles of latitude north of Cape Bazaruta. At 4 o'clock we passed "Makoban," and another of the mouths of the Sabi, and then the mouth of the Gabulu, or Gavuru, which comes down from near the frontier of the Portuguese territory at "Terra de Croa," and enters the sea in about  $21^{\circ} 8' \text{ s.}$  At midnight we reached Santa Carolina, the small island occupied by the Portuguese. The large islands of Bazaruta and Bengura have only native inhabitants. On the 1st of April I reached Bengura; there is a channel between it and the land for vessels not drawing more than  $1\frac{1}{2}$  fathom of water. Further south there is an island called Sijini, and two islets, Shidundesesi and Bangwa. The point where people land at San Sebastian is called Singoni. We reached this



on the 2nd of April, and started at once for Inhambane. On the fourth day we reached the Lake Inyamani ("the large lake"), about 6 miles long. We crossed the Portuguese frontier at the River Inyamfu, and then traversed independent territory to Shivalu's kraal. He is the first chief tributary to the Portuguese settlement at Inhambane. We next stopped at Matshegowo's, in the hollow of Burra Falsa, or False Bay, formed by Cape Lady Grey, in latitude  $22^{\circ} 56'$ . On the 6th we crossed the Isonziweni River, and descended to the sea-beach. The country now became thickly inhabited, with abundance of coconut-palms, which had been planted by the natives. On the 8th, still travelling near the sea, we had our first glimpse of the hills at the north entrance of Inhambane Bay. We then struck in through a dense forest, with a rich soil and numerous gardens of Kafir corn. This district is terribly infested with a tick of nocturnal habits, which causes severe fever by its bites. On April the 9th I reached "Coche," on the north-western side of the bay, and the next day crossed to the town of Inhambane in a launch.

On the 10th of April I embarked in the steamer *Adonis* for Delagoa Bay, which I reached safely and happily on the 2nd of May. During the passage we entered the Mapoota, or Usutu, River. Having crossed shoal water at its mouth at high tide we found the river a mile wide, and with abundance of water for the steamer's draught, which was  $7\frac{1}{2}$  feet. A message and present were sent to the Chief Nonzungili, of the Makasan tribe, inviting him to come on board. A golden sovereign was sent back as a present, with a complimentary message, in return, but the chief himself kept at a safe distance.

*Abstract of the Fourth Journey.* By Dr. MANN, F.R.G.S.

It will be remembered that these journeyings of Mr. St. Vincent Erskine have principally concerned the approximately coast district of South-Eastern Africa that lies between the Limpopo and Zambesi rivers. Umzila's kraal, which is the most inland point of the traveller's excursions, lies about 140 nautical miles due west of Sofala, and would be not more than 200 nautical miles in a direct line from Mosilikatse's (Umzeligasi) kraal, situated on the threshold of the high mountain plateau of Mashona-land, and of the gold-bearing region traversed by Karl Mauch and Thomas Baines. It is obvious that the route traversed by Mr. Erskine on his third journey, from Chilwana, would afford a ready and very desirable mode of access to this mountain region, if

Umzila, the chief of what Mr. Erskine calls the Gaza country—the Mandanda district of the older maps—were favourable to the venture. This was one of the practical objects at which Mr. St. Vincent Erskine aimed. From his own account of the third journey, however, it will appear that Umzila has no present intention of opening the door beyond his own domain, and that this is a difficulty which will have to be overcome by time, and by the gradual progress of events, before this interesting part of the country between the Limpopo and Zambesi can satisfactorily be opened out. It is clear that the present idea of the wily chief who dwells beyond the upper stretches of the Sabi River, is to reserve the mountain gold for the time when the ivory of the forests and plains, which now yields so convenient a royalty, has been exhausted by the hunters.

In the autumn of the year in which Mr. Erskine returned to Delagoa Bay from his trading trip, he once again landed on the Manhlin coast, intent upon turning the permission which he had received from Umzila to account, by hunting the elephant. The district to which his licence applied was that known as Mazibbi, immediately beyond the Manhlin frontier. He was here joined by 100 native hunters, whom he had engaged at Lorenzo Marquez, in Delagoa Bay, and who had marched overland through the Chobe country. He passed the Gabulu River and entered the Manhlin territory on the 3rd of November, 1874, and remained hunting between Timbiti, near to the 23rd parallel of south latitude, and the Sabi, until the end of June, 1875. During this time he followed the rudest form of the hunter's life. He had neither tea, nor sugar, nor pots or pans. He lived altogether upon elephant-meat and water, with the addition of such coarse native food as he could procure from time to time. He had arranged to send up a present of guns, that he had brought for Umzila, direct from Bazaruta, in the hope that by that means he would avoid the necessity of a personal visit to the King. But in this, as it turned out, he had reckoned without his host. After he had been some time engaged in his hunting, a messenger came to him from the royal kraal to tell him that the King wanted to see him, and that no excuse could be allowed.

The attention of the traveller was mainly occupied upon this occasion with the exigencies and demands of the hunter's life. But his journal nevertheless contains reference to some matters of geographical and general interest, that are worthy of a place in the transactions of the Society.

The expedition does not appear to have been attended with remunerative results. About ninety tusks were secured, over



and above some small collection that was made on the ground of old outstanding trade debts. The game was comparatively scarce in the Mazibbi district, and the arrangement with Umzila did not permit the operations to be shifted to the more productive grounds of Makalingi, Indoboleni, and Shiskongi, where elephants were said to abound. Mr. Erskine found that for an expedition of this character, each hunter required a provision of not less than 15 lbs. of gunpowder, 70 lbs. of lead, and 450 percussion-caps. For the party which Mr. Erskine had in his service this would have amounted to 1500 lbs. of gunpowder, 7000 lbs. of lead, and 45,000 caps. His own preparation, indeed, had actually involved something in excess of half this amount, but was insufficient for the circumstances of the case. He believed that 20 picked hunters would have given better results with an expenditure of not more than one-third the ammunition, but he remarks that it is simply impracticable to get any selection of this character. The skill and capacity of the hunter is only discovered in the progress of the hunt. Mr. Erskine thought that in his experience about ten elephants were wounded for every one that was secured. The native hunter, however, invariably refers any want of success with his game to some fault in the performance of an initiatory charm, or incantation, called "*Pahla Umhamba*," which is carried out under Umzila's authorisation. This incantation was duly administered by Sibomo, the chief of the Mazibbi, on behalf of the first batch of hunters who arrived; but this subordinate chief refused to repeat the incantation for those who came afterwards, saying it could only be done at the risk of his own life. This caused great discouragement to the rest of the party. The natives confidently believe that the elephants are made more vulnerable, and that they are led to the hunting grounds where they are doomed, by the performance of this incantation. Exceptionally successful hunters are conceived to possess some "*muti*" or charm of this character of their own which draws the elephants into their toils, and makes them powerless against the bullets. Incense from India and pastiles are very generally looked upon as potent "*elephant medicines*," and in some districts small pieces of coal are accepted as by no means inefficient substitutes, when the incense and pastiles are not to be had.

Mr. Erskine was strongly impressed upon this expedition with the unexpected fact that facilities for successful trade diminish with distance from the base of operations. The best trading work is done in the immediate neighbourhood of the Portuguese settlements, to which the natives themselves come

for the traffic. When they themselves bring produce in this way to the traders' doors, they are naturally disinclined to carry it away again, and are therefore disposed to give favourable consideration to any reasonable offer. On the other hand, when the white trader transports his merchandise to the homes of the natives, the influence tells in exactly the opposite way. It is the white trader who is then disinclined to carry his wares back again, and the natives accordingly are not slow to recognise this difference, and to take advantage of their opportunity. Mr. Erskine found that, from this cause, india-rubber, bees'-wax, and even ivory, were actually cheaper near Inhambane than they were far up amongst the independent tribes. The trade amongst the Umgonis, or Zulu masters of the land, was literally of no value at all, as *their* expectation is that barter is to be carried on upon the principle of a friendly interchange of gifts, in which the Zulu share of the bargain is to consist of large promises never fulfilled. The objects of barter which were most valuable and "current" amongst the Tongas, were 8-yard pieces of blue bafta, 32 inches wide; red and white striped salem-pore; blue-ground prints; and red Umgazi beads, about the size of a pea, with a white eye. There was only a limited sale for muskets, powder, and caps. Blankets, and most of the fancy articles acceptable elsewhere, were quite unsaleable. Iron picks are not worth the cost of transport.

On his incidental trip to Umzila's kraal, which was again performed upon a donkey, this time sent up to him for the purpose by Mr. Beningfield, he crossed the Sabi River about 40 miles lower down than the drift which he used in 1872, probably in about  $21^{\circ} 30' \text{ s.}$  and  $33^{\circ} 15' \text{ E.}$  The river here bore its usual character of an immense sand-bed, more than a mile in width, with a small stream meandering tortuously in the midst from side to side. Here and there reedy islands stood in the midst of the river, or occasionally upon the sand, which was of a vivid orange tint, contrasting singularly in most places with the sombre green herbage of the raised banks. His interview with Umzila took place about the 6th of March, at a new kraal on the banks of the Sinike, to which the King had removed since 1874, and which was called "Utshani Udi," the place of long grass. It stood in  $20^{\circ} 35' \text{ s. lat.}$  It proved that what Umzila especially wanted just at that time was a silver ring, which was to have a lion rampant upon it, and the inscription, "Umzila. Inkosi kwa Gasa." Mr. Erskine, however, had not a sufficiently good opinion of the King's fidelity to professions and promises to undertake to furnish the ring. He stated that he heard of one instance at this time in which



Umzila had managed to get goods worth 1000*l.* from a Portuguese into his hands, and had given him back in exchange ivory not worth more than 250*l.* The interview was a brief and altogether unsatisfactory one, and led to no practical result.

There are several distinct characters of Bush Land recognised by the Tongas of this district. These different tracts are based upon physical peculiarities of the ground, and are distributed in the form of belts, which are so well recognised and known that they serve as valuable landmarks to the hunters, and guide them in their course when neither sky nor horizon can be seen.

The UMTONTO consists of open woods of deciduous thornless trees, some 20 feet high, growing in hilly tracts to a larger size, and sinking in sterile regions into mere scrub. They are without underwood, but are often draped with hair-like lichens. The tree is a leguminous plant, and its bark is universally used for the construction of corn-bins, canoes, and water-vessels. The soil is sandy, with little grass on the plains, and a red clay upon the slopes of the hills. The ETSENGI is a dense, thorny, almost impenetrable scrub, without grass, chiefly found in damp places at the bottom of rising ground. The UMZIMBITI occurs invariably upon a bright-red soil, both as woods and forests, but never upon the mountains. The trees are straight, and grow closely together, like some trees in England. The ground is destitute of other vegetation, and covered with fallen leaves. The leaves are shining, dark olive-green on the upper side, and white and velvety below. Meat roasted with the wood is bitter and uneatable. The juices of the plant are poisonous, as is also the honey collected in the neighbourhood of these trees. The MONJO is an open and grassy country, much frequented by game, especially in the early morning. It has a hard subsoil, with outcrops of limestone, and frequent water-pools. It is dotted over with Umtomboti, Umganu, or Muruli trees, and numerous trees of large size bearing edible fruit. It has also hooked-thorn trees with knobby bark. The MAGWASHA is a dense, thornless scrub-bush, with intertwining lianas and climbers, on a red soil, destitute of water, swarming with ants, and occupying the higher parts of the plains towards the base of the mountains. The IMBALENI is open country, with grass and water-pools. It is almost synonymous with Mapanini, or Pool-country. The UMSAGARI is low bush of Makwakwa (strychnine), Mashlala, and other fruits resembling the Kafir orange. It has a white sandy soil, and is without underwood. The MARUKA is a land of ant-hillocks, often as large as summer-

houses, with the bush confined to the summits of the mounds. A little beyond the frontier, which divides the Imbendane's from the Shishongi, an open country, with brackish water, was entered, with water-pools encrusted with salt round their margins. This salt plain stretched to some distance, and then a heavily wooded tract was reached.

In the wood immediately beyond the thirsty salt plain Mr. Erskine was fortunate enough to find a cherry-like fruit, known to the natives under the name of "simwerbi," and furnishing a delicious and refreshing feast. Its juice is, however, so heavily-laden with india-rubber that the moustache gets varnished and the lips almost cemented together, when the fruit is eaten; the berry is, nevertheless, one of the most palatable fruits of the country—with a lusciously sweet taste and with milky juice. It has a few light-brown enamelled seeds, and grows in luxuriant abundance upon a large evergreen tree. Elephants appreciate this fruit quite as highly as men. The natives look upon the trees in the light of a granary during a couple of months or so, when they are golden with their crop. The fruit is at its best in the middle of January, and at that time it is made into a very pleasant wine, decidedly the best drink prepared by the natives, who also prepare fermented beverages from the imbongwa, the mayogomela, the waterboom, the umtshangowa, and a species of palm—all wild and uncultivated products of the bush.

The imbongwa is the india-rubber plant of the country. It bears an edible fruit, which yields the juice that is fermented into wine; the fruit is about the size of an orange, with a yellow skin or shell, easily broken by the thumb-nail. It contains a number of flattish seeds, which are imbedded in a small quantity of acid pulp, saturated with sweet juice. The seeds and pulp are squeezed out and watered, and then put in the sun to mature. The plant is a climber, with a light-brown, rough, lumpy bark, and with a stem that is occasionally as thick as a man's arm. The small leaves are set upon the ends of the branches. The india-rubber furnished by this plant is of the kind which is known as "fingers."

The "Makwaka," or "Umfooma," a very highly-prized Tonga food-luxury, is prepared from the large calabash-like fruit of a deciduous shrub, which Mr. Erskine believed also to be allied to the strychnine or nux vomica plants, and which is greatly appreciated by the elephants and their thick-skinned kindred. The calabash is full of a bright orange-coloured seed, about as large as a shilling, when ripe, and at that time covered with a thick, glutinous coat. The seeds are dried upon a wicker-



work frame, fixed over a hole with a fire kindled at the bottom. The seeds acquire a flavour from the smoke, and assume a dark-brown colour. The roasted seed-coat, or testa, is then stripped off the seed by the women, pounded up in wooden mortars, and pressed into drums made from the umtonto-bark. In that stage it is very like oat-cake, and if it has been mixed with honey, is palatable, notwithstanding its pervading bitter taste. There is a refined way of preparing it green, when it is called "shugutsu," and is deservedly in high estimation. In this form of preparation the seeds are soaked in a succession of quantities of water, to extract their bitter flavour, before they are stamped. In this state, however, the product is so rich and rare that it is not to be bought. A dark-coloured oil drips from the drums of the matured makwaka in considerable quantity; and this proved to be quite as good as olive-oil for lubricating the guns. The fat of a land-iguana also yielded a very serviceable oil for the same purpose, which seemed never to congeal.

Mr. Erskine speaks of a plant of the *Strophanthus* family, as yielding a powerful poison used by many of the inland tribes for anointing their arrows and spears, or assegais. The poison is so energetic that men wounded by the arrows in the fleshy part of the leg have been known to die within three hours. With small bucks the poison takes effect before they can run out of sight. The seeds of the plant, which are the parts from which the poison is extracted, are known to the natives under the name of "umtsuli." The flower is yellow, with curiously-tailed petals, and the seed has the form of a huge military frog-button, with lobes nine inches long. The plant is a runner, bearing large, rough-ribbed leaves, arranged in clusters of three or four together. Each shoot consists of three branches, of which one bears the seed and the other two the leaves. The plant is probably indetical with the one described by Dr. Livingstone as being used for the same purpose. The active principle of the poison appears to be strychnine. The solitary donkey was shot by a poisoned arrow near Injarkazan's kraal, having been apparently mistaken for a hyæna in the darkness of night. The arrow fortunately struck the bones of the spine. It was carefully cut out, and the wound washed with hot water. The wounded part became very swollen and painful, and a profuse salivation followed; but the donkey recovered.

The finest timber-tree that was met with was a species of *Gardinia*, known as the umshanatse, or mapani, and possessing small book-like leaves. There were specimens of this tree which would have furnished planks 2 feet wide and 40 feet long.

Near to the Portuguese frontier, in the approach towards Inhambane, Mr. Erskine made the acquaintance of a people known as the "Marongwes," whom he distinguished unconditionally as the finest race he had any communication with. They are of the same blood as the Chobis, Mandandas and Mashongonini, and bear a somewhat marked resemblance to the Basutos. They are armed with strong six-foot bows, are very brave, and are reputed to have great skill in bush-fighting. They live in dense communities, and clear and plant large stretches of ground, sometimes exceeding a hundred acres in extent, which are cultivated in common, with the families of the cultivators scattered around the margin of the clearing in separate kraals. The country was thickly inhabited, and abounded in fowls, corn, beer, and honey; in some places these people possess coconut-palms, the sugar-cane, and bananas, and distil ardent spirit with stills of native manufacture. Gigantic specimens of baobab-trees abound, covered by castana-nut creepers, which are festooned to the ground, and form magnificent canopies quite impervious to the sun's rays. Mr. Erskine dwells quite lovingly upon the interesting scenery produced by the thriving gardens of this industrious race, ornamented and interspersed with the magnificent canopies of foliage.

The Mandowa race, which occupies the hill country above Sofala, is probably a branch of the Makalala tribe. It submitted to the Zulus, without fighting, at the time of the invasion of 'Cnaba, and has since remained tributary to Umzila, by whose father 'Cnaba was dispossessed. Their own hereditary chief, Umgapi, still dwells on the Umkini River, some distance towards the north. The south-western frontier of the supremacy of the Zulu Chief Umzila is now at the commencement of Manblin, in  $22^{\circ} 50' \text{ s.}$  All the tribes within this frontier, whether Chobi, Basiga, Bila-Kulu, Mandanda, or Mandowa, are classed together as Tongas, although severally of different blood and origin; but that designation is simply the general title of contempt for the subject tribes which has been applied to them by their Zulu conquerors, who in their turn are distinguished throughout this district as Umgonis. Mr. Erskine's narratives abound in frequent illustrations of the wretched state of destitution and misery in which the subject-races are kept by the Zulu despotism, which has here fastened upon the land. In many parts the country seems to be in very much the same state that Natal was when the first English traders settled on its coast, and found the Zulus of Chaka dominating and plundering the Natal tribes. Umzila and his father Manukuza, it



will be remembered,\* were the direct successors of the Zulu Chief 'Cnaba, who fled from the vengeance of Chaka in the days of his early ascendancy, and found a convenient spot upon the sources of the Sabi to set up for himself, and practise the arts of tyranny, from which he had fled.

Mr. Erskine observed that ants are not uncommonly propagated by being carried down the rivers in flood upon rafts of vegetation, until they are finally deposited on islands in the course of the stream. He quotes instances of their having taken up a permanent abode upon spots which they have reached in this way, and of their having increased there with such rapidity as to finally dispossess and expel the human occupants who preceded them.

A very interesting allusion is made in more than one place of the journals to a melodious feathered songster, called "Umloti" by the natives, which only sings, like the nightingale, before the dawn and after sunset. It is a grey-and-brown bird, with a little red upon its plumage, and its Kafir name means that it is the "king of songsters." The natives say that it lives upon insects and white ants, and that it dies immediately from fright, if captured.

An ingenious device which Mr. Erskine adopted for the recovery of the exact date, when he had lost his count of days in his rude hunting life, is worthy of notice. He first found his correct latitude by cross observations of the declinations of suitable fixed stars. He then observed the meridian altitude of the sun, upon the first practicable occasion afterwards, and, referring to the columns of an almanac, found what the day of the year must be when the sun attained such a meridian altitude in that particular latitude. On the 4th of April he thus determined the latitude of Timbare's kraal by stars, as being  $21^{\circ} 29'$  s., and then on what he conceived to be the 7th of April found that the meridian altitude of the sun was 25 minutes less than it ought there to be on that day, and that consequently the day was the 6th, and not the 7th of April.

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\* See 'Journal of the Royal Geographical Society,' vol. xlv., p. 97.

*Memoranda of Astronomical Observations.*

## LATITUDES.

*Sextant Observations.*

## Chilwana Town—Fabre's Factory.

August 10, 1873 (by $\alpha$ Aquilæ) .. .. .	20	41	48
August 11 do. .. .. .	20	41	20

Lambisa's Kraal, Manama's District (Shitembu),  
head of Maluli Creek.

August 15 ( $\alpha$ Lyræ) .. .. .	20	45	15
August 18 ( $\alpha$ Pavonis) .. .. .	20	49	37
Mean .. .. .	20	47	26

Majisi's Kraal—adjoining Nonxanga's— $\frac{1}{2}$  of a mile north  
of bank, Sabi River.

August 24 ( $\alpha$ Pavonis) .. .. .	21	1	24
September 1 ( $\alpha$ Aquilæ) .. .. .	21	2	21
September 2 (same star) .. .. .	21	2	21
Mean .. .. .	21	1	52

## Near Ivauli's Kraal—hut on south bank of Sabi River.

September 23 ( $\alpha$ Gruis) .. .. .	21	11	53
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NOTE.—Observations by north stars only throw latitudes 1' south of mean,  
and by south stars only 1' the opposite way.

## Kraal of Malumelila, in the Bush, highest part of Magwasha.

October 10 ( $\alpha$ Pegasi) .. .. .	20	42	24
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## Camp near Umzila's Kraal, Tshama-tshama.

November 26 ( $\alpha$ Arietis) .. .. .	20	22	27
November 29 ( $\alpha$ Eridani) .. .. .	20	22	14
November 29 ( $\alpha$ Arietis) .. .. .	20	22	33
Mean .. .. .	20	22	33

Camp, south bank of Sabi; return route near Kwikinele's  
Kraal, Shishongi District.

December 3, 1873 ( $\alpha$ Argo) .. .. .	21	17	16
January 8, 1874 ( $\alpha$ Tauri) .. .. .	21	17	28
Mean .. .. .	21	17	22

Mouth of River Gorongosi, north bank Boene Island,  
Coco-nuts 1 mile north.

March 19 (Pollux) .. .. .	20	28	0
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# 48 MR. ST. VINCENT ERSKINE'S *Third and Fourth Journeys*

At sea, six miles off Sabi Mouth. River bearing s. 50 w.

Magnetic.

March 30, 1874 (sun) .. .. .	20	58	0
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## *Fourth Journey.*

Kraal of Matshesi—Manhlin.

October 27, 1874 (α Andromedæ) .. .. .	22	12	0
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Kraal of Sihoya—Manhlin.

November 2 (α Pegasi) .. .. .	22	33	48
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Kraal of Maporpi, Umzibbi.

No date (α Andromedæ) .. .. .	22	46	17
„ (α Eridani) .. .. .	22	47	46
Mean .. .. .	22	47	1

Kraal of Magnini, Mazibbi District.

February 15, 1875 (Regulus) .. .. .	22	22	0
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Kraal of Imsolan, Shishongi District.

February 19 (Canopus) .. .. .	21	56	0
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Ihuban's Kraal, Imbendan's District, south of Sabi River.

February 20 (Pollux) .. .. .	21	42	0
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Matshumi's Kraal, Imbendan's District.

February 24 (Canopus) .. .. .	21	27	0
„ (Pollux) .. .. .	21	24	30
Mean .. .. .	21	26	0

Pulu Miti's Kraal, Magwasha District, north of Sabi River.

February 26, 1875 (Pollux) .. .. .	21	22	20
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Umgazwi's Kraal.

February 28 (Regulus) .. .. .	21	05	00
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• Utshani-Udi, Umzila's New Kraal, south of Tshamatshama.

March 8 (Pollux) .. .. .	20	35	53
„ (Regulus) .. .. .	20	35	34

Return journey, Siefa's Kraal.

March 22 (Regulus) .. .. .	20	47	43
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Tumbari's Kraal, Shishongi District.

April 1 (Regulus)	..	..	..	..	..	..	..	21	29	0
„ (sun)	..	..	..	..	..	..	..	21	28	50

Haydu's Kraal, Mazibbi District, Matengwan's people.

No date ( $\alpha$ Centauri)	..	..	..	..	..	..	..	22	58	0
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Frontier of Portuguese Territory, Terra de Croa, 10 miles to s.e.

Camp on confluence of Ingdgoa and Manya River,  
north of Inhambane.

October 15, 1875 ( $\alpha$ Andromedæ)	..	..	..	..	..	..	..	23	36	37
„ ( $\alpha$ Eridani)	..	..	..	..	..	..	..	23	36	37

*Variation of the Compass.*

September 7, at Manisi's Kraal, Likugu District, Sabi River, adjoining Nonxanga's Kraal	..	19	12 w.
September 8, same place	..	18	18 w.
November 12, Umzila's Kraal—Tshama-tshama	..	19	15 w.
November 22, same station	..	19	30 w.

NOTE.—For Map of the district concerned in these journeys, see 'Journal of the Royal Geographical Society,' vol. xlv., page 45.



TABLE of LATITUDES SUPPLEMENTARY to MR. ST. VINCENT ERSKINE'S JOURNEY of 1871-1872.

## SECTION I.

PLACE.	Date.	Object.	Meridian Altitude, Artificial Horizon.	Index Error.	Result Latitude S.	Position to be Adopted.		REMARKS.
						Latitude S.	Longitude E. by D. R.	
Inhambane .. .. .	1871. July 20	☉ Sun's L. l.	90 18 20"	+5 25	23 52 30"	23 52 30"	35 25 00"	Agrees with Raper's 'Tables of Positions.' ☉ ☉ stands for upper and lower limbs of the Sun.
S. bank, Inyanombi River, Ma- gajin's Kraal.	Aug. 2	☉ Sun's L. l.	95 50 20	+2 30	23 56 17	23 56 17	34 56 00	Inyabalungu.
In the Bush .. .. .	3	☉ Sun's L. l.	96 10 15	+3 40	24 2 11	24 2 11	34 41 00	
S. of Umkelingi River .. .. .	5	☉ Sun's up. l.	97 52 20	+3 40	24 14 00	24 14 00	34 03 00	
S. of Inyabalungu River .. .. .	7	☉ Sun's L. l.	97 35 00	+3 10	24 22 00	24 22 00	33 41 00	
N. of Unvuma Kraal .. .. .	8	☉ Sun's up. l.	98 54 40	+3 15	24 37 48	24 37 48	33 26 00	
Manjobo's Kraal N. bank, Limpopo River.	12	☉ Sun's L. l.	100 0 20	+2 00	24 42 00	24 42 00	33 04 00	
Ditto .. .. .	26	* Altair, N.	113 31 00	+3 00	24 40 00	..	..	Differing 6' in conse- quence of floating glass of George Ho- rizon being practi- cally inefficient. See Memo.
Ditto .. .. .	26	* α Paro S.	115 11 20	+3 30	24 45 49	24 42 54	33 04 00	
Shidudu's Kraal, N. bank, Limpopo	Sept. 7	☉ Sun's up. l.	118 35 10	+0 20	24 47 54	24 57 54	33 14 0	
Inyama's Kraal, S. bank, Limpopo	8	* Morkab, N.	101 7 30	Nil	24 58 00	24 58 00		
Inhlovugasi's Kraal, ditto .. .. .	9	* Altair, N.	112 59 0	"	24 59 00			
Ditto .. .. .	9	* α Paro, S.	115 44 00	"	25 00 00	24 59 30		

Month of Limpopo, Inhampura, Bembo Ouri, or Miti River, S. side	20	* a Eridani, S.	114 41 30	25 14 36	..	..	George Horizon again ineffective. Blowing hard. Obligated to use floating glass— pressure of wind and blown sand col- lecting on glass fal- sifies the arc. But opposite stars—same time—compensates, and mean correct.
Ditto	20	* 7 Pegasi, N.	100 50 00	25 7 50	25 11 13	33 31 00	
Kraals near river on hills	18	Altair, N.	112 4 30	25 7 00			
Ditto	18	a Paro, S.	115 56 0	25 7 00	25 7 00	33 31 00	
Magen's Kraal, behind hills, S. bank, Limpopo and Coast.	22	☉ Sun's l. l.	128 19 30	-0 35	25 9 36		
Mabingwan Kampane District	Oct. 17	* a Pegasi, N.	112 3 50	-0 30	24 42 00		
Ditto	17	a Gruis, S.	134 10 20	-0 30	24 30 00	24 40 30	
Hlabagati's ☉ Stockade	26	a Gruis, S.	133 55 30	-0 30	24 32 15	24 33 15	33 33 00
Matshenk's ☉	27	a Eridani, S.	113 11 30	-1 0	24 28 20	24 29 00	34 08 00
Siopabagaya ☉	30	Morkab, N.	102 1 0	-1 0	24 29 46	24 29 00	34 18 00
Mahonti, City of Makwakwa	Nov. 9	Morkab, N.	102 55 40	-0 30	24 2 30	24 26 00	34 26 00
Ditto	11	Aherend, S.	112 21 30	-0 30	24 03 34	24 3 00	34 25 0

☉ Fortified village.

Maronga (again return routes longitude by D. R. differs 11 miles, exactly the amount due for difference between miles and minutes of longitude not allowed for—showing perfect check.

# SECTION II.

Leave Inhambane for northwards, 1871.							
Mabotsban, Shibuki River	Dec. 31	a Eridani, S.	111 16 45	-0 30	23 31 00		
Ditto	31	Aldebaran, N.	110 31 40	Nil	23 30 7	23 30 33	35 22 00
Ehlati Kraal boundary, Portuguese possessions.	1872. Jan. 8	Aldebaran, N.	101 31 20	+0 30	23 00 00	23 00 00	35 23 00

A subject of the Portuguese.

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TABLE OF LATITUDES SUPPLEMENTARY TO MR. ST. VINCENT ERSKINE'S JOURNEY OF 1871-1872—continued.

## SECTION II.—continued.

PLACE.	Date.	Object.	Meridian Altitude. Artificial Horizon.	Index Error.	Result Latitude S.	Position to be Adopted.		REMARKS.
						Latitude S.	Longitude E. by D. R.	
Imbooban Hlenga country .. ..	1872. Jan. 11	Aldebaran, N.	102 9 50	Nil	22 40 54	0 1 0	0 1 0	Tonga of Umzila.
Ditto .. ..	" 11	Canopus, S.	120 11 25	"	22 42 51	22 42 00	35 22 00	
Matsabeni's, Chief of E. Hlenga	" 29	α Orionis, N.	120 2 30	"	22 37 43	22 37 42	35 12 00	
Ditto .. ..	" 29	Canopus, S.	120 1 00	"	22 37 41	22 37 42	35 12 00	
Maporpi .. ..	Feb. 1	α Orionis, N.	120 18 30	"	22 28 30	22 28 30	35 10 00	
Ditto .. ..	" 1	Canopus, S.	119 45 10	"	22 29 20	22 28 55	35 10 00	
Sifook or Seonjan, Chief of Bela	" 4	α Orionis, N.	120 43 40	"	22 15 55	22 16 30	35 13 00	
Kula and Gabulu River, S. bank.	" 4	Canopus, S.	119 19 54	"	22 17 09	22 16 30	35 13 00	
Ditto .. ..	" 7	α Orionis, N.	120 45 26	"	22 15 00	22 15 00	35 01 00	
Ingubi's Kruai .. ..	" 7	Canopus, S.	119 18 45	"	22 15 00	22 15 00	35 01 00	
Ditto .. ..	" 10	α Canopus, S.	118 38 31	"	21 51 00	21 53 00	34 50 00	Parallel of Walfish Bay, West coast, 4 miles north of parallel of N. point Bazaruta Island, East coast.
Sihamel, Chief of Umlazwi .. ..	" 10	Procyon, N.	125 5 00	"	21 55 00	21 53 00	34 50 00	
Ditto .. ..	" 16	* α Argo, S.	117 41 50	"	21 28 8	21 27 00	34 20 00	
Inyampambane Birni District	" 16	* Procyon, N.	126 1 0	"	21 27 00	21 27 30	34 20 00	
Ditto .. ..	" 16			"				
Sihenzi, S. bank, Sabi River .. ..	Mar. 6	Jupiter, N.	92 26 40	"	21 19 43	21 19 30	34 15 00	
Ditto .. ..	" 6	β Argo, S.	84 19 40	"	21 19 30	21 19 30	34 15 00	
Sondaba Zulu, Governor of Shos- hono District, S. bank, Sabi River.	" 8	β Argo, S.	84 18 00	"	21 18 40	21 18 40	34 15 00	
Ditto .. ..	" 8	Jupiter, N.	92 27 30	"	21 18 40	21 18 40	34 04 00	
Mahusu's Kruai .. ..	" 9	Jupiter, N.	92 33 30	"	21 15 21	21 15 21	34 01 00	

Macleagan's	10	Jupiter, N.	92 42 20	21 10 40	33 51 00
Ditto	10	β Argo, S.	84 2 00	21 10 40	33 41 00
N'an	12	Jupiter, N.	92 49 50	21 6 45	33 27 00
Tibit	14	Jupiter, N.	93 2 40	21 00 15	33 27 00
Situbi	16	Jupiter, N.	93 14 55	20 54 30	33 30 00
Ditto	16	β Argo, S.	83 27 40	20 54 13	32 51 00
Impari	17	Jupiter, N.	93 32 10	20 44 53	32 37 00
Gwegwegwi, Right bank (South), Unswelisi River.	19	Jupiter, N.	93 43 20	20 39 00	32 37 00
Makwan on Plateau	21	Jupiter, N.	93 55 00	20 34 00	32 33 30
Gwingi District	21	Pollux, N.	82 14 55	20 33 6	32 33 30
Ditto	22	Jupiter, N.	93 56 00	20 33 00	32 33 30
Ditto	22	Regulus, N.	114 0 0	24 34 00	32 33 30
Camp at Matugiti, near Umzila's Kraal, under Silinda Mountain.	April 16	Crucis, S.	96 5 15	20 25 17	
Ditto	16	☉ Sun's up. 1.	119 4 53	20 24 00	32 34 00

## SECTION III.

Umzila's Kraal, Tahamatshana sources, Unswelisi River, near Silinda Peak and Forest.	June 26	☉ Sun's l. l.	92 3 50	+5 0	20 22 40	32 30 00	With pocket sextant.
Ditto	28	β Centauri, S.	101 15 00	Nil	20 22 18	32 43 00	
Ditto	28	Arcturus, N.	99 31 20	22	20 24 7	32 45 00	
Mafusi, Queen of Inhacfo (pronounced Inyowkthla), Insiwa stream.	May 23	☉ Sun's l. l.	97 47 15	-6 40	20 13 59	32 44 00	Erskine's furthest.
Kamba lemon-trees	24	β Leonis, N.	109 13 30	-6 30	20 9 56	32 45 00	
Imboongwan Kraal, Lusiti River	25	β Centauri, S.	100 43 20	-6 30	20 3 5	32 45 00	
Foot of Shiyola, or Sita Tonga, or Shitoratanga Mountains, Haroni River, junction with Lusiti.	..	By dead reckoning.					
Tahamatshana	..	..	..	..	..	..	
Injakazan Zone Valley	July 30	☉ N.	84 39 30	Nil	20 32 48	32 30 00	See preceding pp.
		* a Cor. Bor.					



TABLE of LATITUDES SUPPLEMENTARY to MR. ST. VINCENT ERSKINE'S JOURNEY of 1871-1872—continued.

## SECTION IV.

Place.	Date.	Object.	Meridian Altitude, Artificial Horizon.	Index Error.	Result Latitude S.	Position to be Adopted.		REMARKS.
						Latitude S.	Longitude E. by D. R.	
Injakazan Zone Valley .. ..	1872. July 30	S. * a Δ Aust.	83 29 00	Nil	20 32 46	20 32 47	32 36 00	* a Cor. Bor. stands for a Corona Borealis, Δ Aust. for a Trian- gulus Australis.
Mahomondo's .. ..	,, 31	S. * a Δ Aust.	83 43 30	,,	20 37 05	20 38 00	32 38 00	
Umfaan .. ..	Aug. 1	N. * a Cor. Bor.	84 12 50	,,	20 45 50			
Ditto .. ..	,, 1	S. a' Δ Aust.	83 56 20	,,	20 44 30	20 45 10	32 40 00	
Impanda .. ..	,, 2	N. a Cor. Bor.	83 47 50	,,	20 58 28			
Ditto .. ..	,, 2	S. a Δ Aust.	84 19 50	,,	20 56 15	20 57 21	32 47 00	
Impogonyolo .. ..	,, 2			By dead reckoning.				
Mahungu .. ..	,, 5	N. ☉ Sun's up. l.	104 28 40	+0 25	21 12 30	21 06 00 21 12 30	32 59 00 32 54 00	☉ stands for Sun's upper limb.
U'Larkoni Drift, N. bank, Lopi River.	,, 12	N. ☉ Sun's l. l.	106 56 20	+0 20	21 25 40	21 25 40	32 53 00	☉ ditto for Sun's lower limb. Sabi River.
Halata .. ..	,, 15	N. a Lyrae	59 16 00	+0 40	21 43 23	21 42 30	33 03 00	
Munju River, 1 mile S. of it ..	,, 17	N. a Lyrae	58 52 50	+0 30	21 55 23	21 54 30	32 55 00	
Gwerwatsi River .. ..	,, 19	N. a Lyrae	58 36 50	+0 30	22 03 03	22 02 00	32 58 00	
U'Tshetu River .. ..	,, 21	a Lyrae	58 21 20	+0 30	22 10 48	22 09 30	32 56 00	
Umgothu River, Sisorki .. ..	,, 23	☉ Sun's l. l.	112 30 00	+0 45	22 32 20	22 32 20	33 10 00	Date obliterated in note-book.

Inyantsitshi .. .. .	28	N. α Lyrae	56 52 10	+0 30	22 55 30	22 54 30	33 15 00
Inyangomba .. .. .	30	N. α Aquillae	116 20 30	+0 30	23 18 00	23 17 00	33 10 00
Matsambu, S. bank of the Limpopo River.	Sept. 1	N. α Aquillae	116 1 20	+0 30	23 27 38		
Ditto .. .. .	1	S. α Paro	112 36 00	+0 30	23 26 00	23 26 50	33 05 00
Meeting of the waters—Limpopo (Bembo), and Oliphant (Upaluli).	6	N. ☉ Sun's I. L.	118 39 15	+0 30	24 8 46		
Ditto .. .. .	6	N. α Aquillae	116 1 20	+0 30	24 7 24		
Ditto .. .. .	6	α Paro, S.	112 36 00	+0 30	24 5 30	24 8 00	33 02 00

From repeated experience with the Instrument used, I discovered that all objects observed to the North placed the latitude about 1' (one minute) S. of the mean of two on opposite bearings, and vice versa for Southerly objects. Consequently the column "Position to be adopted" gives the corrected latitude when there is only one observation, or the mean where there are two.

ST. VINCENT ERSKINE.

#### SECTION V.

Meeting of the waters—Limpopo (Bembo), and Oliphant (Upaluli).	1872.								
Ditto .. .. .	Sept. 6	☉ Sun's I. L.	118 39 15	+0 30	24 8 00				
Ditto .. .. .	6	α Aquillae	116 1 20	+0 30	24 7 24				
Banga's Kraal (Sifumbat)	6	α Paro	112 36 0	+0 30	24 5 30	24 8 00	33 2 00		
Ditto .. .. .	8	α Aquillae, N.	114 58 0	+0 30	23 59 19				
Matsatshi .. .. .	8	α Paro, S.	113 36 43	+0 30	23 56 20	23 57 49	32 33 00		
Ditto .. .. .	12	α Aquillae	115 8 15	+0 40	23 54 00				
Tabi River, near Junction	12	α Paro	113 26 0	+0 40	23 51 00	23 52 30	32 20 00		
	15	α Eridani, S.	111 59 40	+0 35	23 52 40				
Lisani Nwshalis Kraal	15	α Aquillae, N.	115 5 10	+0 35	23 55 40	23 54 10	32 08 00		

No more people along river until Basutos at Myaki.



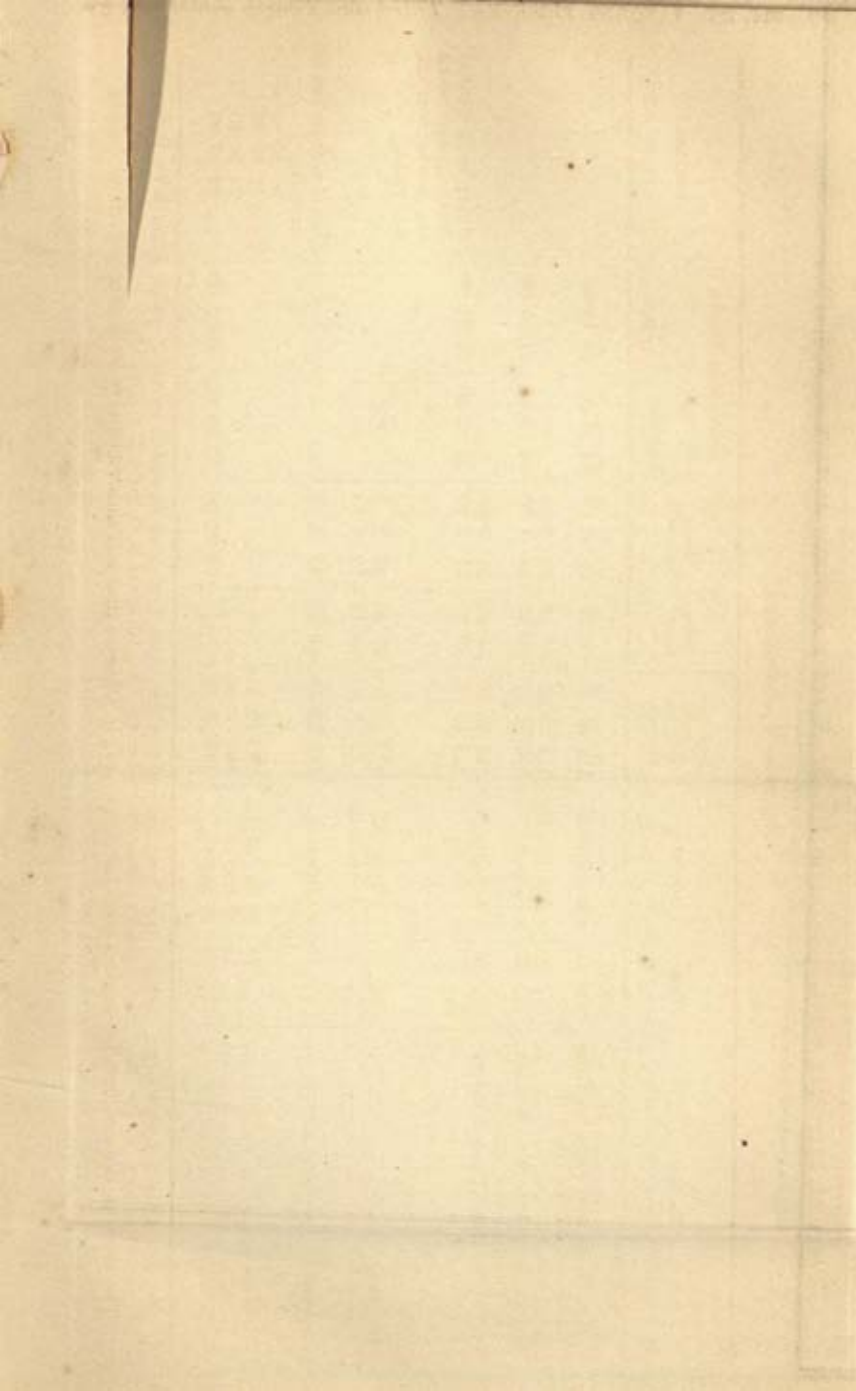
TABLE of LATITUDES SUPPLEMENTARY to MR. ST. VINCENT ERSKINE'S JOURNEY of 1871-1872—*continued.*SECTION V.—*continued.*

PLACE.	Date.	Object.	Meridian Altitude, Artificial Horizon.	Index Error.	Result Latitude S.	Position to be Adopted.		REMARKS.
						Latitude S.	Longitude E. by D. R.	
Upatali River, near Junction Schalata River, 5 miles below it.	1872. Sept. 21	α Aquillæ, N.	114 45 0	+0 35	24 5 00	24 4 00	31 45 00	
Upatali River .. .. .	" 22	α Aquillæ, N.	114 43 30	+0 35	24 6 00			
Umgothomeri Junction, S. bank, near Old Kruals of Sumbani	" 22	α Pavo, S.	113 52 30	+0 35	24 4 00	24 5 00	31 40 00	
Myaki (The Gate) Upatali River.	" 23	α Aquillæ, N.	114 46 40	+0 35	24 5 00			
Ditto .. .. .	" 23	α Pavo, S.	113 49 0	+0 35	24 2 00	24 3 30	31 34 00	Solitary settlement of Basutos, who work the native iron ore into picks.
Lydenburg	Oct. 5	γ Pegasi, N.	100 50 50	+0 40	25 7 5			
Transvaal .. .. .	" 8	α Andromedæ, N.	73 3 40	+0 40	25 6 29			
Ditto .. .. .	" 10	α Eridani, S.	114 23 13	+0 35	25 4 17			This is a reduction to meridian.
Ditto .. .. .	" 10	☉ Sun's L. L.	130 19 20	Nil				H. M. S.
Ditto .. .. .	" 10	☉ Sun's L. L.	130 6 30	"				Time 12 21 28
Ditto .. .. .	" 10	☉ Sun's L. L.	129 50 10	"				12 23 45
					25 04 06	25 05 00	30 37 00	12 25 00

The longitude of Lydenburg is deduced from bearings and distances carried up from Newcastle in Natal, which latter town is fixed by Survey at long. E. 29° 52'. See Appendix, Erskine's "Journey," &c., 'Journal R. G. S.,' vol. xiv., p. 127.

The above are deduced from the original notes lost temporarily in a flooded river and since found very much damaged but yet legible.

ST. VINCENT ERSKINE.  
January 9, 1878.



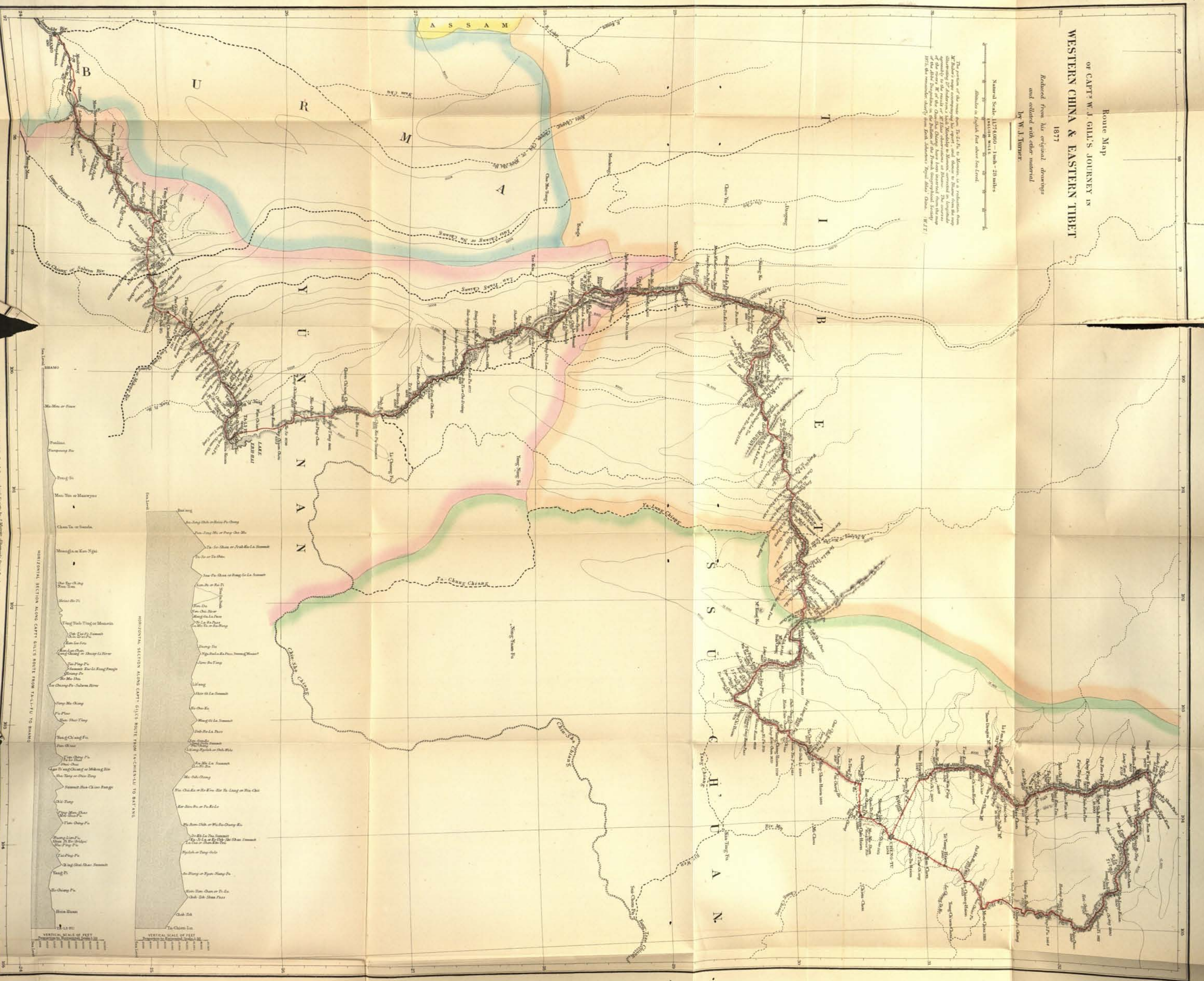


Route Map  
OF CAPT. W. J. GILL'S JOURNEY IN  
WESTERN CHINA & EASTERN TIBET  
1877

Reduced from his original drawings  
and collated with other material  
by W. J. Hooper.

Natural Scale 1:177,000 - 1 inch = 20 miles  
Horizontal Scale 1:177,000 - 1 inch = 20 miles  
Vertical Scale 1:177,000 - 1 inch = 20 miles  
Distances in English Feet above Sea Level.

The portion of the route from Tai-fu to Moupin is a reproduction from the original drawings of the author, and the portion from Moupin to the Great Wall is a reproduction from the original drawings of the author, and the portion from the Great Wall to the Great Wall is a reproduction from the original drawings of the author.





IV.—*Travels in Western China and on the Eastern Borders of Tibet.* By Captain W. J. GILL, R.E.

[Read, April 8th, 1878.]

INTRODUCTION.

HAVING recently returned from travels in Western China and the borders of Tibet, I had the honour to be invited by the President of this Society to read a paper on the subject; and although I cannot lay claim to have made any great geographical discoveries, or passed through any thrilling adventures, I gladly accepted the offer; for even if I do not succeed in interesting the Society, I at least have an opportunity of publicly thanking those many friends, to whom I owe a debt of gratitude that can never be repaid.

Before leaving England Col. Yule took the greatest interest in my plans; his crowning thought of kindness was a letter of introduction to Baron von Richthofen, a traveller who has perhaps done more for geographical science than any living man, and whose masterly work of erudition will be handed down to all posterity as a monument of the genius and industry of the German explorer. In his delightful society a week sped by as a few moments, and it is mainly to his counsels that I owe what small measure of success has fallen to my share.

It seems almost presumption on my part to speak of the work of one so immeasurably above me in every way; but perhaps it may be forgiven me, if I say that wherever I had an opportunity of testing his accuracy, it was only equalled by his wide grasp and breadth of view.

I owe much to the French missionaries, who, in whatever towns I met them, spared no effort to assist me, and render my stay agreeable; especially to Monseigneur Chauveau, who, bearing the courtly manners of a nobleman of the old French *régime*, would have made me forget that I was standing on the borders of a wild and barbarous land, if his enthusiasm as a propagator of the faith had not kept it constantly before me.

At Bat'ang the Abbé Desgodins, whose name as a geographer is not unknown, was a genial and pleasant companion. Here also the chief magistrate, Chao-Ta-Laoye, who, contrasted with the generality of Chinese officials, is as "bright metal on a sullen ground," treated the foreigner that had descended upon him, with a generosity that would put to shame our boasted civilisation.

Lastly, I must bestow one word of thanks on my old friend Marco Polo, who never failed either to amuse or instruct me.

Being at Shanghai in January of last year, anxious to see



something of the little-known Central China, I was not slow to accept an offer made me by Mr. Consul Baber, whose name is well known in connection with the Grosvenor Expedition, that I should accompany him to Ch'ung-Ch'ing.

Thence I travelled by myself for a couple of months through Tzū-Liu-Ching, Ch'êng-Tu, Li-Fan-Fu, Sung-P'an-T'ing, Lung-An-Fu, and back to Ch'êng-Tu, where I was joined by Mr. Mesny, a gentleman whose long service under the Chinese Government, and intimate knowledge of the language and ways of the people, enabled him to render me the greatest assistance, and to whom I am mainly indebted for the admirable and friendly relations we always maintained with the officials and the people.

With him I travelled to Ta-Chien-Lu, Li'ang, Bat'ang, A-Tun-Tzū, Ta-Li-Fu, Yung-Ch'ang, T'êng-Yüeh-T'ing, and Bhamo, whence an English steamer took us to Rangoon.

Of the journey to Ch'ung-Ch'ing I need say but little, it has been admirably described and the route accurately surveyed by Blakiston; I will therefore pass it over in as few words as possible.

Four days in one of the magnificent steamers that ply on the Yang-tzū bring the traveller to Hankow, 680 miles from Shanghai. Here the river is about  $\frac{3}{4}$  mile broad. This, when I was at Hankow, was the limit reached by steamers; but under one of the clauses of the last convention, steamers now ascend to I-Ch'ang, whence, from all accounts, they return as empty as they go up.

The journey to Ch'ung-Ch'ing occupied two months from Hankow, and was performed in a Chinese boat hired at the latter place. These are somewhat clumsy shallow vessels, about two feet out of the water at the bow, and very high at the stern, on which are built up great houses, much after the fashion shown in pictures of the "Great Harry."

Through the great alluvial plain of the Yang-Tzū for a month we followed the course of the mighty river, until, after winding through many a long reach in this uninteresting and monotonous country, the new port of I-Ch'ang was gained. We only stopped here long enough to see the English Consul and the principal Chinese officials pelted with mud and stones by a foolish mob, and then we plunged into the giant gorges, where walls of rock rise hundreds of feet on either hand; passed many a quiet village or town, lying at the foot of hills, all yellow at this season with great crops of rape, where in the background massive mountains hide their everlasting heads in clouds; ascended rapids almost like waterfalls, where the water, hissing, foaming, and boiling over the half-sunken rocks, is somewhat exciting

even to the most apathetic nerves; made picnic excursions inland, taking long walks through lovely mountain scenery, breakfasting in some little shanty on the very edge of a deep rift in the rocks, where, far below, the brawling of the stream as it dashed over its rocky bed could only be indistinctly heard.

One by one the days sped by, and a month after leaving I-Ch'ang we arrived at Ch'ung-Ch'ing, next to the capital, Ch'êng Tu, the most important town in this great province of Ssü-Ch'uan.

Here we bid adieu to the owner and captain of our noble vessel, a lady, the violence of whose temper was only equalled by the foulness of her tongue.

### THE PROVINCE OF SSÜ-CH'UAN.

We are now fairly in the province of Ssü-Ch'uan, one of the most beautiful, perhaps the richest, and, for foreigners, certainly the most pleasant in the empire; endowed by nature with every charm of variegated scenery—giant mountains in the north, of whose peaks of perpetual snow little more has been known than the wild statements of ancient geographers, that one of them attained a height of 36,000 feet; fertile plains, where in the driest season the rice-crop never fails; and undulating hills, where streams have cut deep channels in the soft sandstone—the hand of man has not been slow to utilise these advantages; everywhere the hills are laid out in terraces for cultivation, irrigation is carried on to an almost inconceivable degree, and, although the inhabitants have not learnt the art of making water run up hill by itself, one of the most remarkable features in a Ssü-Ch'uan landscape is the sight of the countless contrivances and water-wheels by which water is raised.

Riding down a stream, I have seen as many as twenty or thirty wheels, 24 feet in diameter, turned by the current and lifting water at the same time.

Standing on the top of some hill and looking down on a plain, dotted over the landscape a number of mushroom-like objects are observed, which, on close inspection, turn out to be the umbrellas under which coolies sit, and all day long, by a species of little treadmill, lift the water from one field to another.

Nor are the arts neglected by the gentle people of this happy province, and the traveller, as in the evening he nears his journey's end, long before he arrives at the city where he is to sleep, is made aware of its vicinity by the numerous triumphal arches built across the road. These—ornamented with rich carvings, most artistically finished, of household scenes or official duties—have generally been raised by some



widow to the memory of her deceased husband; and in them the design is as elegant, as the workmanship is finished.

The careful way in which everything is roofed here must strike the eye of any traveller; houses, gateways, bridges, triumphal arches, and, indeed, almost wherever it is practicable to put a roof, there one is sure to be; even the walls are often coped with glazed tiles, so that the timber-work, being built in the most solid manner and carefully protected from the weather by an efficient covering, lasts an incredible time, even in a country where rains and snow are regular in their occurrence.

Besides the officials, the people of this province are mostly either merchants or agriculturists, the literati—that generally highly-favoured class in China—being held in light esteem by the men of Ssü-Ch'uan; and to this is probably owing the fact that foreigners are always treated with great politeness, as wherever opposition to foreigners is carried to any great extent, it will generally be found to be owing to the influence of the literati class. This was, I believe, the case at I-Ch'ang, where there was some rioting, to which I have referred; and during my stay at Ch'ung-Ch'ing the literati of that place posted an inflammatory placard in very bad rhyme, which Mr. Baber translated into very good verse. This was, perhaps, not quite so witty as it would have been had he been the author instead of the translator. The placard seemed to be treated by the people there with the contempt it deserved, and throughout my wanderings in Ssü-Ch'uan I never heard an uncivil word. The dominant characteristics of the Chinese race are inquisitiveness and curiosity, and in this the people here are not behind their countrymen of other provinces. In some of the towns, however, their natural politeness seems to overcome even their curiosity, and I have often sat with my door open to the public thoroughfare, engaged in writing—an occupation that always caused the most profound interest—and have been left completely undisturbed.

The little boys, not less mischievous than in Europe, of course are omnipresent. In one of my walks in Ch'eng-Tu, I was one day surrounded by a noisy laughing crowd of children, that somewhat impeded my movements, when an old gentleman in passing rebuked them for their want of manners.

Of course in many places the patience of the traveller is somewhat tried by the eager crowd, who, never before having seen a foreigner, come in hundreds into the yard of the inn, block up the doorway, get gradually pushed on from behind, until the whole room is full; tear the paper from the windows (there is no glass, and the windows are usually paper-covered lattice-work), and even scratch holes in the plaster-walls to get

a peep. Still, it is mere curiosity, which must be excused in a people brought up as they are in the most narrow-minded prejudices, and to whom a foreigner, especially if he be of a fair complexion, appears as hideous and extraordinary as his clothes seem uncouth and ridiculous.

The agriculture of the Chinese has, I think, been somewhat overrated. The chief point in which they are superior to other nations is the exceeding care they take that nothing be wasted. Nevertheless the people is eminently an agricultural one. In their ways, their customs, their buildings and their food, there is a wide distinction between them and the pastoral races that are found on their frontiers. In the habits of these there always remains a trace, and often something more than a trace, of the nomad life; whilst in China proper and amongst the Chinese everything betokens the ancient and high civilisation of a people that have taken root in the soil.

In every city and almost every village in China inns are found, an indication of a people accustomed to live in houses, and who when obliged to travel must have a roof to shelter themselves; the very coolies, poorly as they are paid, never sleeping in the open, but invariably expending some portion of their small earnings for night accommodation. Amongst the Tibetans, and in the Mantzu or barbarian population in the mountains, this is not the case; the people all originally leading a wandering life, the idea of inn accommodation has not penetrated into their habits. A Chinaman will under no circumstances sleep outside if he can help it; in Tibet the master of a good house will as often as not be found passing his night on the flat roof; whilst the hardy people in the winter time can sleep with their clothes half off, and their bare shoulders in the snow. In China no house is complete without its table, chairs, and bedsteads, rough and clumsy though they often are; in Tibet these accessories of life in a fixed habitation are always wanting. Amongst the Chinese, mutton can rarely be obtained at all; they themselves think it very poor food: the love of a Mongol for a fat-tailed sheep is proverbial, and the natives of Tibet are not behind them in this taste. Although not exactly forbidden by their religion, the idea of killing an ox is very repugnant to the agriculturists of China, because—they say—it is ungrateful to take the life of the useful animal that draws the plough, and in the large towns the butchers are nearly always Tatars. The Chinese, as they never were a pastoral people, never kept flocks and herds; milk and butter are therefore practically unknown to them: Tibet may safely be called a land flowing with milk and butter; the enormous quantity of the latter consumed by a Tibetan is something startling—



butter in his oatmeal-porridge and huge lumps of butter in his tea.

The ordinary food of a Tibetan is tsamba, or oatmeal-porridge, and buttered tea. As a rule he does not drink much milk, partly because it is all made into butter, and partly because, owing to the filthy state of the vessels, milk always turns bad in a few hours; but the traveller who makes his tastes known can always obtain an unlimited supply. Tea is often brought to him made altogether of milk without any water at all. The Tibetans also eat sour cream, curds, and cheese; and this brings a Tibetan bill of fare to an end, which, in its constituents and in its simplicity, bears the stamp of the nomad pastoral race.

The Chinaman, on the other hand, loves variety. In every tea-house by the wayside that owes its existence to no more opulent class than the coolies on the road, there are always several little dishes of some sort. Beans simple, beans pickled, bean-curd, chopped vegetables in little pies, macaroni of wheaten flour, macaroni made of rice, these—and in the large towns and cities, dozens of dishes made of ducks, pork, fish, and vegetables, rice-cakes like muffins, wheaten leavened bread, sweetmeats, and sweet cakes—are to be seen at every turn; and of one or perhaps more of these every coolie will, when he can afford it, give himself a treat and vary his food, the main portion of which is rice, where it will grow, and in the high lands bread made from whatever grain the climate will produce.

In the lower part of Ssü-Ch'uan the roads are generally tracks paved with flags, 18 inches wide. This is sufficient for all purposes where the only wheeled conveyances are the barrows, with the inevitable creaking wheel. Even these are entirely confined to the plains, never being used in the hill countries.

Goods are almost entirely carried by coolies, who, with a split bamboo over the shoulder, with a basket at each end, run along, in the hot weather naked to the waist, with huge broad-brimmed straw-hats on their heads, straw sandals on their feet, and generally a fan in their hands.

In the mountains, mules, ponies, and donkeys are much used as beasts of burden; but even in the steepest parts of the road, between Ya-Chou-Fu and Ta-Chien-Lu, long trains of coolies are passed all day, climbing mournfully, and with measured tread, the desperate zigzags on the staircase-like tracks, which here are called roads.

These carry their loads (sometimes as much as 400 lbs.) on their backs; for in these steep mountains the ordinary method of the bamboo over the shoulder has to be abandoned.

It is only when we reach the high plateau that we find

animals the universal means of transport, and here the yak takes precedence of everything else; very slow in his movements, and accomplishing but a few miles a day, this hardy animal is nevertheless the cheapest that can be employed; requiring no attendance, and no food that cannot be picked up on the mountain-side, or in the glorious pastures of the upland plateau, the cost of keeping a yak is absolutely nothing. A caravan of yaks on the road will, when they arrive at a fine pasture, halt for a few days and let their animals feed; after which they will perhaps travel for three or four days more in the wild stony mountains, with scarcely any food until they reach the next grazing-ground.

In the province of Ssü-Ch'uan every traveller who can afford it rides in a sedan-chair, with two or more coolies, according to his wealth or importance; like everything else in China, the number of these is in certain cases fixed by law, the servant of no official being permitted to ride in a chair with more than two coolies.

#### THE GEOGRAPHICAL FEATURES OF SSÜ-CH'UAN.

Ssü-Ch'uan may generally be described as an exceedingly mountainous country; indeed, the only plain of any importance in the province is that in which the capital Ch'êng-Tu is situated.

It is bounded on the north and north-west by mountains forming the buttresses of the great Himalayan plateau, which extends to the north-east across the whole frontier of the province.

On the map I have had drawn two lines that may very roughly, of course, be considered as contours of 8000 and 12,000 feet. There are some who still deny that the mountains of China are connected with the great Himalayan system; but when it is remembered that there is a high plateau commencing westwards of Lassa, and extending (with a sweep to the north) right up to the Chinese province of Kan-Su, and that in all this there is no single point at a less elevation than 12,000 feet above the sea (the Chin-Sha is 13,000 in long. 94°. *Vide* Prejevalsky's Map), it seems to me that if there is to be any meaning attached to the word "*connection*," the Chinese mountains must be considered as belonging to the Himalayan system; and whilst on this subject I will, as briefly as possible, give the data on which I have, with what will perhaps be considered considerable rashness, drawn the contour of 12,000 feet. Commencing at the north-east extremity, the ridge that divides the Lung-An from the Sung-P'an Valley is crossed



at about the snow-line (June) at an elevation of over 13,000 feet, with peaks to the south somewhat higher, whilst still further south there are other peaks which, from their considerable elevation above the snow-line, cannot be less than 15,000 feet, and where glaciers were reported to me as existing. I have therefore given the contour represented in the map.

To the north of Sung-P'an-T'ing the road that leads to Ko-konor was described to me as very dreadful; my informant assured me that in the winter the wind cut great gashes in his face and arms, and was much disappointed because I could give him no medicine to protect him.

Sung-P'an itself is about 10,000 feet; behind it can be seen a very considerably elevated chain of mountains, and I have no doubt whatever that the water-parting between the two great rivers, the Huang-Ho and the Yang-Tzū, is in an upland considerably more than 12,000 feet above the sea.

Coming south-west to Li-Fan-Fu, this place, though itself only 5000 feet high, is on a stream that below this city falls 1500 feet in 30 miles, and evidently descends with great rapidity from high lands above. Another sure indication of an elevated plateau is found in the fine good-looking ponies that the natives bring down, as they do to Sung-P'an-T'ing and Ta-Chien-Lu. It is also surrounded by snowy peaks; snow-fields were reported to me as within 20 miles, and glaciers at no great distance.

The region to the south-west of this is a little known mass of mountains. The contour must there take care of itself until we meet it on the day we leave Ta-Chien-Lu, at about 8 miles distant from that place.

Thence to Bat'ang the road lies nearly always at an elevation of above 12,000 feet. A little beyond Bat'ang the Chin-Sha is crossed at an elevation of 8000 feet (Bat'ang is 8500 feet), and the road immediately rises to the water-parting between the Lan-Ts'ang and the Chin-Sha at an altitude of 15,790 feet.

A little further to the south, on the western face of the mountain, lies A-Tun-Tzū, at an altitude of 11,000; and still more to the south the road again crosses back to the Chin-Sha basin over a pass, of which the altitude is about 14,000 feet.

These few details are, I think, sufficient to show that this contour has not been drawn altogether on hypothetical grounds.

#### TSÜ-LIU-CHING.

One of the most remarkable places in the province of Ssü-Ch'uan is Tsü-Liu-Ching, where brine is drawn from deep wells

and evaporated by gas, that rises through other wells bored for the purpose to immense depths.

The road from Ch'ung-Ch'ing winds about amongst the low hills that spread over this part of the province; a charming landscape meets the eye at every turn; the slopes well sprinkled with wood, but nearly all the land under rice-cultivation; the valleys being laid out in terraces, as well as the sides of the hills, where these are not steeper than 30°. There is besides the rice a small amount of wheat and poppy. Every now and then the road is sheltered by high hedges of pomegranate, where oranges coming into blossom and clusters of wild roses fill the air with their perfume.

The town of Tsū-Liu-Ching is situated on the left bank of the river, 100 yards wide, which here runs between rounded hills; approaching it, the great number of scaffoldings (some of them 100 feet high) look like the chimneys of a great English manufacturing town; a resemblance carried out by the busy appearance of the people. The place is wretchedly poor, notwithstanding its industry and its great export of salt, which goes to Ch'ung-Ch'ing, I-Ch'ang and Kwei-Yang, but not to Ch'êng-Tu.

The landlord of the remarkably good inn at which I stopped, who was a Christian and part owner of some brine-pits, took me to see his works; here some of his people were engaged in boring one of the holes; this was already 2170 feet deep, the average rate of boring being, if all went well, about 2 feet a day; but they said that they often broke their things, that accidents happened, and that it was 13 years since this well had been commenced.

The jumper for boring is fastened to a bamboo-rope attached to one arm of a lever; the weight of 3 men who step on to the other arm raises the instrument, the men then leap nimbly off the lever on to some wooden bars fixed for the purpose, and the jumper falls.

Another workman stands at the mouth of the bore, and each time the jumper is lifted he gives a slight twist to the rope; the rope untwisting gives a rotatory motion to the jumper.

This operation is continued all day, the coolies employed showing the most extraordinary and untiring activity.

A few yards off was a finished fire-well, somewhat deeper than the one in progress; a bamboo-tube about 3 feet long had been put into the mouth of this boring, and some clay was plastered over the upper end to prevent the bamboo from burning. Up this well and through the bamboo the gas ascends from the bowels of the earth, and is lighted at the top; when the light was extinguished, the odour of the gas was very powerful



of sulphur and very slight of naphtha; the latter smell was imperceptible when the gas was burning.

At no great distance was a brine-pit, which, I was informed, was 2000 and some hundreds of feet in depth, and about 3 inches, or perhaps a little more, in diameter at the top; immediately over the mouth was erected a scaffolding a little over 100 feet high.

To draw the brine from this well, a bamboo-tube 100 feet long, open at the top and closed at the bottom by a valve, serves as a bucket. A rope fastened to the upper end of this passes over a pulley at the top of the scaffolding and round an enormous drum; this drum, turning on a vertical axis, was 8 or 9 feet high and about 20 feet in diameter; 4 buffaloes are yoked to this, and thus the rope is wound up; near the end the rope is marked with bits of straw, like a lead-line on board ship, so that a man watching knows when it is near the end, and warns the drivers. There is a driver to each buffalo. The bamboo being raised from the well, a coolie pushes the end over a receptacle, opens the valve with his finger, and allows the brine to escape. When the water has been let out, the buffaloes are unyoked, and the bamboo and rope descend of themselves. This sends the drum round with a frightful velocity, which, in rotating, of course produces a violent wind.

The "break" for this is simplicity itself; a few strips of bamboo pass horizontally half round the drum, and are made fast at each end; these strips hang quite loose until a coolie, leaning against them, tautens them up, checks the pace of the drum, and stops it in a very few seconds. The brine thus raised is conducted to the evaporating-pans over the fire-wells I had already seen.

In this establishment, by no means the largest in the place, there are employed 40 coolies and 15 buffaloes, the latter in a stable kept beautifully clean (a most remarkable thing in China). They produce here 8000 to 10,000 catties (10,000 to 13,000 lbs. avoirdupois) of salt per month; the proprietor pays no duty, but sells it for 18 to 20 cash a catty ( $\frac{1}{2}d.$  to  $\frac{3}{4}d.$  per lb. avoirdupois); the purchaser then sends it away by coolies, paying duty at the barriers, 300 cash ( $13\frac{1}{2}d.$ ) per coolie-load, whatever that happens to be; it generally runs from about 160 to 200 catties (210 to 260 lbs. avoirdupois).

In some places they have the fire without the brine, and at a place about 5 miles up the river there is brine but no fire; the brine is therefore brought down from here in boats, of which I counted about 100 lying by the bund constructed to keep a sufficiency of water in the river for these vessels.

At the top of the hill, close to the town, there is a fire-well

without any brine; the principle of the pump being unknown, the method of raising the water is the clumsy and laborious one of a row of small buckets passing round two wheels, one at the bottom and the other at the top of a tower, of which there are a good many about in different directions. A blindfold mule going round and round at the top is the motive power; the water is thus raised 20 to 30 feet at a time, a trough leading from the top of one to the bottom of the next tower; in this case the brine was lifted seven stages before it finally reached the fire.

Some years ago some Chinese connected with a European firm attempted to introduce pumps; they only had their heads broken for their pains by the coolies, who declared that their labour was being taken away from them; since this no further innovations have been attempted.

None of the people seemed to know how many brine-pits there were in the neighbourhood; some of them hazarded a guess that there were a thousand, but they must be far more numerous.

#### THE CAPITAL OF SSŪ-CH'UAN.

The city of Ch'êng-Tu is, as old Marco styles it, "*a rich and noble one*," somewhat irregular in shape, and surrounded by a strong wall in a perfect state of repair.

In this there are eight bastions, four of which are gates. It is now  $3\frac{1}{2}$  miles long by about  $2\frac{1}{2}$  miles broad, the longest side lying about E.S.E. and W.N.W., so that its compass in the present day is about 12 miles. A stream, about 30 feet wide, runs through the city from west to east; parts of this are embanked with perpendicular revetments on either side.

The city is well laid out, the streets straight, and at right angles to one another, well and carefully paved; the shops are very good, with handsome fronts; in them every description of goods is sold, and there is especially a very large trade in silk.

In the neighbourhood of this city is a very small valley given up to the cultivation of a plant used for dyeing silk, and which has a reputation all over China for being better than any produced elsewhere.

On the south side runs the main river, about 100 yards wide, which is crossed by many bridges; one of them, 90 yards long, has a roof, and, as is the case on nearly all covered bridges, hucksters sit down under the shelter on both sides, as in the days of the old Venetian traveller, and sell whatever they can to the passers-by. The walls formerly enclosed the temple of Wu-Hou-Tz'u, now a mile or two outside the city to the south-west.

In the early part of the Ming dynasty (1368-1644), the



whole province was overrun by a brigand named Chang-Shien-Chung; he went about ravaging and destroying everything, and is pictured as a devil incarnate; amongst other things he destroyed all the books, so that the ancient written history of the place is lost.

The existing city walls were built only in the time of the second or fourth emperor of the present dynasty (1662-1795), the place having been entirely destroyed about two hundred years ago. Ch'êng-Tu, as it now is, is divided into two parts, the Chinese and the Tatar cities, both enclosed by the main wall. Not quite in the centre of the Chinese city, but rather towards the west, is the Imperial Palace, a rectangular open space enclosed by massive walls about 20 feet thick; this was built towards the end of the fourteenth century by the first or second emperor of the Ming dynasty, the Ming emperor employing one of his family as governor or king of the provinces in this part of China. The buildings inside this are now used as the examination hall.

The city of Ch'êng-Tu bears on its face all the evidences of wealth and prosperity. Some of the temples here are richly endowed, and a detailed description of one may not be out of place.

The monastery now called the Wun-Shoo-Yuen, or literary Book-hall, was built some time during the Sung dynasty (from 600 A.D. to 1000 A.D.). It was then called the Chin-King-Sze; it fell into decay during the Mongol invasion, and was rebuilt by the second emperor of the present dynasty, whose name was Kang-Shi or Kang-Hai, about the year 1660. This emperor richly endowed it with lands; but, notwithstanding its wealth, it seems to have been predestined to misfortune, for it was again neglected until the time of Kia-Ching, the fifth emperor of the present dynasty (1795-1820, A.D.), when it was rebuilt by public subscription with stone instead of wooden pillars. Since that time it has gone on increasing in wealth and magnificence, and is now one of the richest in the country. To have the right of living at this monastery it is necessary to be a priest of a particular sect, but, besides the priests, there are resident here a number of students qualifying themselves for holy orders; altogether there are about 150 inmates.

A remarkable air of refinement and cleanliness pervaded the place; the courtyard was laid with smooth cut flag-stones, not one out of its place, and not a weed or blade of grass is permitted to grow in the interstices; all the buildings were in perfect repair, and a man was walking about the court with a cross-bow; his employment was to shoot stones at the sparrows that infested the roofs, and which if left to their own devices would do serious

damage. Immediately on the right of the entrance was a very clean reception room, and whilst preparations were being made to escort us over the establishment, we were refreshed with the usual cups of tea. We were not kept waiting above a couple of minutes and then we were invited to proceed. The refectory, a long wooden building on the right hand side, opened into the court; here were twenty-five tables, each prepared for six people; for each person was laid one pair of red wooden chopsticks and three porcelain bowls, one for rice, one for vegetables, and one for tea; no meat of any description ever being permitted here; everything, the tables, bowls and chopsticks were beautifully clean; a most surprising thing in this country where usually dirt reigns supreme. Passing this, we entered a chapel, where at the end the repulsive countenances of a number of huge and hideous images were partially obscured by a kind of throne for the prior, whence he discourses on the religious classics to the students.

On either side of the chapel was a reception-room. The general arrangement of these rooms is almost always the same, and whether a private house, a yamen or a temple, the description of one stands as a representation of all the others; no furniture in the middle of the room, along two sides are arranged in symmetrical though inartistic order the usual heavy, stiff, uncompromising and utterly uncomfortable arm-chairs of China; between each two is a little high and square table, all corners and angularities, like the Chinese character. At the end of the room is the kang or raised dais, 10 feet long, 4 feet broad, and 2 feet high, where in the centre is placed a small table, 6 or 8 inches high, between two cushions of the most brilliant scarlet; these are the seats of honour, and footstools of wood for those seated thereon complete the furniture.

For ornament a few bronzes or the roots of trees carved into representations of impossible dragons are arranged behind the kang, while from the ceiling hang paper lamps, some of them really artistically painted, and arranged just low enough to knock off the hat of a foreigner. In China etiquette rules that in polite society the hat is kept on the head, and at a dinner-party it is amusing, when all the guests are intimate and of the same social standing, to see the alacrity with which permission is always asked and given to exchange the official hat for the little skull-cap which each person's servant has somewhere secreted about the capacious folds of his garment.

A collation of tea and cakes, sweet but nasty, was looked at more than partaken of, while the monks gave us what history of the building I have been able to relate, sitting, as etiquette ordains, with their backs quite stiff on the extreme edges of their



chairs, and with their bodies slightly turned round to their guests.

From here we ascended to the upper story, where the principal room was a magnificent chapel filled with gifts and curiosities—a very fine and richly decorated altar, rubbings from ancient tablets, a great deal of blue and white china, pictures painted on glass from Canton—and amongst other things a present from a young lady of a piece of embroidery entirely worked with her own hair; this represented the Goddess of Mercy sitting under a bamboo, the leaves of which were really most admirably represented.

In this chapel also the contributors to the building, maintenance or decoration of the temple are immortalised, their names being written in gold on black tablets and put under a glass case. Here also is the library, where huge cupboards are filled with the books of the religious classics which form the unique and dreary study of the inhabitants.

We passed on to another chapel set apart for meditations; here the priests and students, in yellow robes and with shaven heads, come at least once a day, and, lighting an incense-stick before one of the images, sit down at the side of the room and meditate, trying to work themselves into a state of religious ecstasy, in which they shall be entirely withdrawn from impressions from the outside.

A few of them appeared to be really in this state of semi-unconsciousness; but the majority, though trying to look as if they did not see us, could not resist a sidelong glance every now and then. They remain in this state about half an hour at a time. The impression formed on my mind by the appearance of those who had succeeded in their extraordinary task was rather a painful one.

Passing through another chapel, where a number of beautiful red and yellow lotus-plants were growing in pots, where a tailor was at work in a corner, and in which were the portraits of all the deceased priors, we again came to the gate, where a number of huge and hideous figures—the guardians of the place—were grinning horribly, and where the monks with exquisite politeness bade adieu to their unwonted guests.

#### THE ASCENT TO SUNG-P'AN-T'ING.

The road from Ch'eng-Tu to Sung-P'an-T'ing is full of interest, both from the natural beauty and magnificence of the scenery, as well as from the numerous historical associations of the country. Here is to be observed the civilised Chinaman in close contact with the mountaineer, who, now driven from the

valleys, takes refuge on the steep hill-side or the wild fastnesses of the mountain gorges.

Most picturesque are the Mantzu villages perched on the summit of the crag, their gloomy stone walls with tiny holes for windows, and one high tower standing sentinel over the country.

Almost every village passed on the road has its tale; some marvels of a Buddhist saint, a thrilling story of battle or gentle song of love.

The road is now at the level of the stream—now scooped out of the solid rock or propped up for a yard or two by rickety-looking stakes from underneath—now winding up the side of a valley where a cascade leaps down to join the foaming torrent below; or rising over a spur from the mountains that bound it, the ground is carpeted with beautiful and variegated wild flowers.

Leaving Ch'èng-Tu by the north-west gate, the road for eight miles is across the beautiful and fertile plain. Here the whole country is a perfect network of canals and watercourses, and, as the plain begins rising at the rate of 10 feet per mile, the streams are all rapid. The number of trees everywhere is very great; all along the sides of the road, and between the fields are long rows of willows and a kind of beech; round all the houses are clusters. Now there is a line of fruit-trees, oranges or apricots; here a temple is enclosed by a wall with a number of fine yews inside; and, looking back from Kuan-Hsien, the plain has all the appearance of being densely wooded.

Kuan-Hsien is a busy place, situated at the embouchure of the river that here escapes from the mountains, and, by a number of ingenious irrigation works, is directed into the artificial channels by which the plain is watered. The dams for this purpose are, like all Chinese contrivances, remarkable for their simplicity; large boulders, about the size of a man's head, are collected and put into long cylindrical baskets of very open bamboo network; these cylindrical baskets are laid nearly horizontal, and thus the bund is formed.

The amount of water dealt with is very considerable; the stream at this season is 200 yards broad, more a torrent than a river, though a few rafts manage to find down it a somewhat perilous passage.

A little above the town it is crossed by one of those suspension-bridges so common all over this part of China, and which, in their principles and construction, are as simple as they are inexpensive. Six ropes are stretched very tightly one above the other, and connected by vertical battens of wood laced in



and out; another similar set of ropes is at the other side of the roadway, which, laid across, follows the curve of the ropes.

Near Kuan-Hsien is a thin seam of coal; and the manufacture of coke is an important item in the industries of Kuan-Hsien. Charcoal is also made in great quantities, and the trees that are planted in the Ch'êng-Tu plain are mainly utilised for this purpose. A great deal of trade is done here with the interior.

Musk, medicines, deer's horns and the skins of animals are brought down from the mountains, in exchange for which, crockery, cotton goods, and little trifles are taken up. The horns of the red deer when they are shed are collected by the mountaineers, and the numbers of coolies that day after day are passed on the road, bringing great loads of them, is really surprising. The horns are used for the manufacture of horn goods, and are sold at the rate of 14 taels (5*l.*) for 100 catties (133 lbs.). The deer are never hunted except when they are in velvet; the head of a deer then becomes exceedingly valuable; for from the horns in this state a medicine is made which is one of the most highly prized in the Chinese pharmacopœia.

Another precious article brought in by the mountaineers is musk. The musk-deer are usually trapped, for they say that unless the animal is killed dead he will tear out the musk-bag and disappoint the hunter. At Sung-P'an-T'ing the musk is sold for three times its weight in silver.

Great quantities of timber also come down to Kuan-Hsien; but, notwithstanding the extensive trade, the place is wretchedly poor, the town dirty, and the shops inferior. The inhabitants have the credit of being a worthless turbulent lot. I certainly found them exceedingly inquisitive. Large crowds spent the day gazing at a bath towel hung out to dry—the only foreign article presented to their view—and even my Chinese servants could not walk about the streets without being surrounded by a multitude, who must have imagined that some mysterious essence emanated from me and pervaded my people.

The road ascends the left bank of the river, between mountains that here rise about 3000 feet above the stream, their sides so steep as to become in places almost precipitous; and now and then there will be on either hand vertical cliffs 400 or 500 feet high; these are of bare rock, and in them the road is often regularly scooped out, sometimes without a parapet and only just wide enough for laden mules; at others 6 or 7 feet broad, with a stone wall at the outer side. Whenever these beetling cliffs give way to slopes, a luxuriant vegetation of grass, brambles, and beautiful flowery creepers, jasmines, and ferns, gets a hold in the crevices of the rocks. Small ashes, beeches,

and other trees grow in profusion, and the mountains are clothed in green to their very summits. Down at the bottom, where the valley opens out and leaves a little level ground, there is sometimes a patch of cultivation; and, growing amongst the big rocks that lie tumbled about, there are quantities of a kind of barberry, just now in blossom, and with a scent like wild thyme. Round every little village are fine clumps of trees, walnuts, peaches, apricots, and a kind of japonica (*Eriobotrya jap.*), the last now bearing fruit that is sold in great quantities, but is very tasteless.

Away in the mountains there are deer, bears, and wild boar; of the last I saw a young one about a foot long, it was striped longitudinally; the people say that these attain a weight of 400 lbs. A little further the road reaches Wei-Mên-Kuan, a little village, but celebrated in the semifabulous history of the early dynasties.

In the time of one of the Sung emperors, who had eight sons, the youngest was sent as a high military official to Wei-Mên-Kuan. The Mongols and Chinese were then at war, and some Mongols, commanded by a queen, came to this village where a battle was fought, and the emperor's son taken prisoner. In accordance with the humane customs of the country, instead of leaving a captive to linger out a miserable existence in a dungeon, the queen was going to cut off the prince's head in a more or less gentle fashion; but her daughter, casting her eyes that way, saw that the man was of goodly proportions and noble face—in fact, altogether a godlike youth. She then and there fell in love with him, and her mother consenting, the wedding was celebrated with the pomps and glories necessary for such an occasion.

Beyond Wên-Ch'uan-Hsien is seen the first village of the Mantzu, or Barbarians, as the Chinese call them. The word Mantzu seems to be a sort of generic term applied by the Chinese generally to all the aborigines of this country, and many will include in it even the pure Tibetans, though the better informed know how to distinguish between the different tribes.

Perched like an eagle's eyrie right on the top of an almost inaccessible hill, or like wild bird's nests on the face of some perpendicular cliff, these curious villages are very remarkable features in the landscape. The houses are of stone—the lower part with narrow slits for windows like the loop-holes of a fort. The roofs are flat, and on part of these is generally erected a kind of shed.

There are altogether eighteen of these tribes spreading over the country from Yun-nan to the extreme north of Ssü-Ch'uan.



Each tribe has its king—one of them a queen, and they live almost entirely by agriculture and cattle keeping. The king usually derives a considerable revenue from his lands, and every family in his kingdom has to send one man for six months to work on his estate. In other cases he receives an annual amount of eggs, flour, or wheat, from each household. He has absolute power over all his land, assigns certain portions of it to certain families, and if they displease him, or he has any reason for doing so, he displaces them at once and puts others in their stead—all the houses and farm-buildings passing to the new-comer.

One of these royalties—that of Mou-Pin—was at this time distracted by disturbances—a civil war, bandits, robbers, soldiers, and evils of every kind. The king died not long ago, leaving a wife with three daughters and a sister-in-law, who set herself up as the protector of an illegitimate infant son. There was at once a disputed succession, for by the law a female could not sit on the throne. The sister-in-law and the wife each wanted the ruling power. The sister-in-law succeeded in stealing the seal of state. She obtained some boy, who was permitted to go and pay his respects to the widow, as sovereign, while making his obeisance he managed to snatch the seal and escape to the sister-in-law. A war then broke out, some people taking part with the queen-widow, and others with the sister-in-law. As usual in such cases, all the bad characters flocked to the place to feed on the booty; both the queen-widow and the sister-in-law were obliged to take refuge in Ch'êng-Tu, and now the whole kingdom is given over to pillage and the villainies always accompanying a civil war.

Intermarriage goes on between the Chinese and the Mantzu women, but not between the Mantzu and Chinese women. This is much the same as in Tibet, where the Chinese officials are never permitted to take their wives with them, even the ambassador at Lassa being no exception to this rule. The officials and soldiers therefore when in Tibet take to themselves Tibetan wives. The children thus become entirely Tibetan, and when the Chinese officials return to China they usually leave their family behind them. The Tibetans in this are wise in their own generation, for if they permitted the Chinese to bring their wives with them, and raise Chinese families, the country would soon become altogether Chinese.

At Li-Fan-Fu I visited a little Mantzu village, to which I had to climb by a path inaccessible to either mules or ponies, to a height of 2000 feet above the valley. I sat down in the village school, and soon collected a few people around me, who were very willing to give me the little information they possessed.

The Mantzu of this place—or Irun, as they call themselves—are in reality semi-Chinese. They wear the plait, their writing is Chinese, and they all talk Chinese, though they have a language of their own.

The tribe to the west of Cha-Chuo have again another language, though the two are very similar. These have also a writing of their own, which appears to be more or less alphabetical and is from left to right.

The Mantzu here are something like Chinese in appearance. Their dress is the same, but they have good teeth; the Chinese, as a rule, have vile teeth, ill-formed and irregular, very yellow, and covered with tartar.

The village I was in was a wretched place. I walked through the streets, which were about 3 feet wide, between the high stone walls of the houses. The interiors of these were about as dirty and as dark as Chinese houses usually are.

It is not more than 18 or 20 years since the Mantzu were driven from these valleys by the Chinese. Every town and village has some tale to tell of the fight with the Mantzu, and the numerous ruins, which from their appearance cannot be very old, prove how recent were the conflicts in which they were destroyed.

Sometimes a Chinese village is to be seen built close to the ruins of an aboriginal one, and the advance of the Chinese is thus presented to the traveller's eye in a striking manner.

Two other tribes—the Su-Mu and the Ju-Kan (or, as the people here call them, the White Mantzu and the Black Mantzu)—live up a river that debouches a little higher up. The Su-Mu are always ruled over by a queen. When the Tatars were conquering the land, this tribe happened at that time to have a queen for a sovereign, who gave the Tatars great assistance, and, as an honorary distinction, it was decreed by the conquerors that in the future the Su-Mu should always be governed by a queen.

The Su-Mu, or White Mantzu, have been pillaged by the Ju-Kan, their houses burnt, and their villages destroyed. The Ju-Kan now want peace, and have offered the indemnity sufficient to rebuild the houses; but the Su-Mu are eaten up with the desire of revenge, and their queen was (at the time of my visit) at Ch'êng-Tu, praying that soldiers might be sent to punish the Ju-Kan. Should she succeed in getting these, she will probably find herself in the position of the horse who, in *Æsop's fable*, invited the assistance of man.

Beyond this the river still winds about in a narrow gorge, and a little further the first sight of a snowy peak is gained as the valley opens out into a little grassy plain, where a



Chinese village of evidently recent date, surrounded by a patch of cultivation, is almost hidden by apricot and peach-trees.

Not far from here the potato is cultivated. This useful root was introduced by the French missionaries some 50 years ago; the Chinese despise it, as food only fit for pigs and foreigners, but it is surely and steadily gaining ground, and is destined at no distant day to take its place amongst the agricultural products of the mountainous districts.

Leaving the main river, the road to Li-Fan-Fu strikes up a tributary, and the scenery changes; instead of the magnificent verdure we had left, the mountains rise up almost precipitously, and, with the exception of a few blades of grass, are almost bare, standing like a long wall, almost unbroken even by a gully; at the bottom, if there should be a little flat ground it is converted into fields of barley, divided by walls of loose stones, where a village, with its flat roofs, only wanted a few tall, straight poplar-trees to be a model of many a Persian hamlet lying in the valleys of the great Elburz; at a little distance the resemblance was remarkable, and at times I almost imagined myself nearer to the Atrek than the Yang-Tzū. The road was very carefully looked after; sometimes it was supported for a few paces on horizontal stakes driven into the face of the cliff, but these were all in good repair, and where it had been necessary to cut steps in the rock, they were often very regular and good. It is somewhat unusual to find any trouble taken over the roads, but in a case of this kind if they were left to themselves for any length of time they would very soon cease to exist.

As far as Li-Fan-Fu the scenery varies but little. Streams come down from the mountains through dim gloomy gorges, tumbling in little cascades between almost vertical walls of rock, the water in them brown, as if it came from peat-fields above. Li-Fan-Fu is enclosed by a wall, in many places broken down; this wall runs between the houses and the river, and then on both sides climbs a long way up a deep ravine that runs up at the back of the town; but as the houses are only built on the flat ground close to the stream, the walls thus enclose a great deal of vacant space.

From the new pagoda, built a few years ago on a rock about 300 feet high, a fine bird's-eye view of the town is obtained. I counted the houses as well as I could, and at a rough calculation put them at about 120. These, unlike the houses in other parts of China, are generally two-storied, built of stone below, with a wooden upper story and a balcony. All the roofs are flat.

There is a small suburb on the eastern side, but none else-

where. A rushing torrent comes down the ravine, flows through the town, and serves to turn numerous water-mills; for as this is a corn, and not a rice-growing country a great deal of grinding has to be done. The wheels are nearly always horizontal, and are enclosed in little low, round, flat-roofed houses, which look like small forts; they have one little door, and are hardly high enough for a man to stand in.

In this place and around it, under the command of the Sieh-T'ai, there are 500 Chinese soldiers and 3000 Mantzu. These latter are scattered about amongst the Mantzu towns and villages. There is another Chinese town, called Cha-Chuo, 20 miles up the river; that is the last Chinese station, and beyond it there are none but Mantzu.

There were some very good-looking ponies in the streets. These are bred in the plateaux beyond, and cost from 3*l.* to 13*l.*

Returning to Hsin-P'u-Kuan, the main river is again ascended to Mao-Chou, very pleasantly situated, where the valley opens out and forms a little basin about two miles wide, enclosed on all sides by high mountains; two pagodas on neighbouring hills dominate it, and bring it good luck.

Very soon after leaving Mao-Chou the mountains again close in on the river, which now runs through a ravine with narrow and precipitous gorges, great bare slopes and precipices running down to the water, and leaving scarcely a yard of level ground, except here and there, where at the end of a projecting point, or up the bottom of a little valley, a few flat acres are found and cultivated. The great mountain-sides are ragged, and torn about in a marvellous manner, and huge masses broken from them lay strewn about.

Now the road is 300 or 400 feet above—now it descends by a regular staircase of sharp and most uncompromising angular rocks to the water's edge, only to rise again perhaps by a gentle slope, terminated by a regular scramble.

A little beyond Ch'a-Erh-Ngai the river receives from the west an affluent (the Lu-Hua-Ho), which leads to the capital of the Su-Mu by a six days' journey, and the Ju-Kan live an indefinite number of days journey beyond.

A little further the road leaves the gloomy gorge through which the river winds. As it ascends, the slopes of the mountain-sides become more gentle, though often at the very tops are again big precipices; the sides of the valleys are either well wooded with fir-trees, or covered with close and thick brambles, barberries, thorns, and all sorts of shrubs, deliciously fresh and green; and all sorts of wild flowers grow luxuriously, numbers of the purple iris in blossom, and acres of a kind of



purple crocus. Many sweet-smelling herbs shoot up amongst the grass, and the whole scene is very fair to look upon.

I breakfasted in a little inn overlooking the valley. On the other side a great mountain ran down in precipices and steep bare slopes to the river; up a gorge to the left a deep-green forest of firs crowned the summit; to the right, on a small plateau, a Mantzu village hung over the stream, with a little terrace-cultivation on the hill-side. In the background, here and there, a patch of snow was lying on the higher mountain-tops; and below could just be heard the murmur of the invisible river, as it tumbled over its rocky bed. The tinkling of the goat-bells sounded pleasantly in the morning-air, and, after being shut in for so many days in the close gorges, the place and all around it was very delightful.

Tieh-Chi-Ying is on a flat plateau, bounded on three sides by precipices or exceedingly steep slopes, which fall down to the river 1500 feet below. On the fourth side apparently inaccessible mountain crags rise abruptly behind it, the roads to and from it being cut out of the face of the mountain, making it a very strong military position. In the early days of the Chinese here, this was a large and flourishing town; the Chinese were at this time carrying on war with the Mantzu, but one fine day the latter, in vast numbers, managed to get over the summit of the mountain, and amongst jagged rocks and crags, where it would have been thought that hardly a goat could get a footing, they surrounded the town and cut off the water, which was led by a conduit from a mountain stream. The Chinese were either overwhelmed by numbers, or forced to surrender for want of water, and the place was burnt to the ground. It has not yet recovered, for inside the extensive walls there are now but a few houses. There is a garrison of 500 soldiers.

Sung-P'an-T'ing is situated in a valley half-a-mile wide; the bed of the river is wide and shallow, the stream being broken up into several small channels. The mountains are now rounded and divided by open level valleys instead of the close narrow gorges which have hitherto been almost universal. The main valley is all cultivated; the hill-sides are cut into terraces, and crops grown all over them.

Sung-P'an-T'ing is on the right bank of the river, with an extensive walled suburb on the left. A hill runs down from the right bank ending in a small cliff, and the wall of the town runs right up to the side of the hill and takes in a great deal of open and cultivated ground, where barley and wheat are grown. The Mongols of the Ko-Ko-Nor district bring down very good ponies for sale between 13 and 14 hands high, for which they

ask about 50 taels (16*l.*). They also bring down fresh butter, but not in very large quantities.

The second Lama of a Lamassery near paid me a visit, and invited me to go over his Lamassery. When I arrived, Nāwā (for such was his name) was standing at the gate in readiness to receive me. He was a powerful, well-built, upright man, with a haughty look about his eyes, a very firm mouth, and had all the appearance of one who knew how to command.

The Lamassery was a low wooden building, very irregular in shape; about some of the chief rooms there was some coarse embroidery; round the largest of the chapels hung a number of rough pictures of saints, painted on a sort of cotton stuff; in one there was an image of Buddha, who here is known by the name of Khätye-Täbā; in front of him there were a number of lotus-flowers and ten little brass bowls of water. They introduced me into the cell of the Chief Lama, who acknowledged my presence by a slight inclination of the head; he was squatting before an immense pan of ashes, counting beads and muttering prayers.

I did not stop here very long. The Lamas were all excessively dirty and smelt horribly. They were, however, exceedingly polite.

At Sung-P'an-T'ing the Mantzu people have been left behind and we are fairly in the country of the Sifan. These are much more like Chinese, and are very wild-looking people. Some of them wear hats of felt, in shape like the Welsh women's, and high felt riding-boots. They have generally very deep voices, and have not such a trivial look about the face. Their language is peculiar to hear: they roll their "R's" very much, unlike the Chinese, who in many cases cannot pronounce an "R." They have also a great many of the guttural "Kh," and some sounds almost impossible to catch.

Their architecture is almost the same as Chinese, but they do not turn up the ends of their ridges and gables; indeed at a distance the houses look very Swiss. On the hill-sides the roofs are made of planks laid anyhow, with big stones on them to prevent their being blown off—just as in Switzerland.

The plateau between Sung-P'an and Lung-An is scarcely inhabited. Great droves of yaks feed on the rounded hills that here are covered with grass and brushwood, and where hardly a tree is seen. Little traffic passes this way, and the very few inhabitants are altogether Sifan.

Before crossing Hsüeh-Shan (Snow Mountain) I slept in a quaint little shanty that fully justified its name of "Fêng-Tung-Kuan" (wind cave house), and whilst eating my evening meal, fearful stories were told me of the terrors of the pass. I was



warned that, going up, every one must be very quiet. Any one calling out or making a noise would be certain to bring on a terrific wind, a violent snow-storm, hailstones of gigantic dimensions, thunder, lightning, and every evil the elements could shower down. If a man on this mountain should express feelings of hunger, thirst, fatigue, heat, or cold, immediately the symptoms would be intensified to a very great degree. I was told that once upon a time, a long time ago, an official with an army of soldiers came to cross this mountain. He had with him his sedan chair, to which about twenty men were yoked, before and behind, who could not get on without a great deal of shouting. The troops also marching made a great deal of noise. This great functionary was warned that he should not attempt to cross the mountain, for if he did some fearful accident would befall him. He laughed at the warnings, saying that he had the emperor's order, and must go on. So he went: a frightful storm of wind and snow came on; half his army perished, and he himself very nearly lost his life. Such were the tales about Hsüeh-Shan with which I went to bed; and if I did not shiver, it was thanks to the quantity of clothing with which I covered myself.

The plateau as the summit is approached is bare and dreary, especially when viewed in mist and rain. A few patches of snow were lying within 50 feet of the highest point on the western face, and the ridge was crossed at an altitude of 13,000 feet. The characteristics of the eastern slopes of this mountain are very unlike those of the west. Its climate appears much more damp. The growth of trees, flowers, ferns, and grass is so luxuriant as to become in appearance almost tropical. Great pine-forests clothe the northern faces of the mountain sides, while the southern slopes are covered with rich green grass.

The descent is very rapid, and lower down the hills on both sides are densely wooded with trees of the richest green. The ridges from each side every now and then throw out great masses of rock, ending in huge precipices over the valley, and, between these, green grassy slopes, with clumps of trees scattered about as in a park, run right up to the heights above.

The Sifan here live only on the tops of the hills, for the Chinese have driven them from the valleys. Every opening has its tale of war and bloodshed, and the new villages and new houses springing up in the valley show how recent has been the relentless advance of the Chinese.

Further on, azaleas, 15 to 20 feet high, covered with masses of blossom, contrast with the brilliant hue of the wild peony, while the ground is covered with magnificent ferns and mosses,

and the road again plunges into gorges, where cliffs 500 feet high shut out everything but a narrow streak of sky. Still the foliage is luxuriant, trees, shrubs, and flowers clinging in a marvellous way to the almost perpendicular rock. The stream descends 2400 feet in  $12\frac{1}{2}$  miles, so the succession of cascades by which it leaps from rock to rock may well be imagined. In the most gloomy recess of one of these gorges, a long time ago, a hermit took up his residence in a cave; but finding that, even for Chinese eyes, it was exceedingly dark—so dark that he could not even see to boil his rice—he fixed a mirror on the opposite side, which not only reflected the rays of the sun into this sombre dwelling, but (such was the holiness of the man) it had the additional useful property of reflecting the moon also, whether that luminary happened to be above the horizon or not. The hermit has long since been transported to a better sphere, but they say his looking-glass still remains, and the traveller who should have the misfortune to be benighted in this desolate gorge may still see the weird glimmer of the mirror on the darkest and thickest night.

Thirty-four miles from the summit of the snow mountain, and 7000 feet below it, the rice cultivation commences, and thence, the valley being more open, cultivation is universally carried on on the hill-sides. The road, however, does not improve, and here may be seen yet another method of propping it up. Deep holes are cut in the face of the rock, and into these the ends of long stones are placed, which thus projecting from the face of the cliffs, like cantilevers, support the path. Here and there, there was only just room enough for the pony's feet, and in one place, when I was looking at the scenery rather than at my pony, he went so close to the edge of a rotten bank, as to elicit a shout of dismay from my usually phlegmatic horse-keeper. This individual used always to walk behind, and where the descent was a very steep one, over big stones or down a slippery staircase, he would hold the animal's tail to prevent him slipping.

In Ssü-Ch'uan the Chinese will cultivate the hill-sides wherever the slope is not more steep than  $30^\circ$ . This is about the steepest a man can walk up unaided by his hands. From the opposite side of the river the face of a slope of this kind has all the appearance of being nearly vertical, and the people hoeing on them look like flies on a wall. There are generally ten or twelve together, dressed in a line that would please the eye of a British drill-sergeant; and as they advance from the bottom upwards, seen from this point of view, it seems as if they must slip down, and be precipitated into the river below.

Lung-An-Fu, though presided over by a Fu and a Tu-Ssu,



does not appear to be a place of much importance. The wall that surrounds it is its principal feature, and one of my people remarked, very much to the point, that there was plenty of wall but not much house.

About 26 miles from Lung-An-Fu a road leads to the east into the province of Shen-Si.

Below this the silk manufacture commences; mulberry-trees, spoiled of their leaves, surround the houses. The cocoons are put out in great flat baskets to dry in the sun, and the women sit spinning at the doors of their houses.

Indian corn is the chief crop and food of the inhabitants. This is now planted in the fields, from which one harvest of opium has already been gathered. Round the villages there is a little wheat and tobacco, and the graceful bamboo again shelters the houses. The limit of this seems to be, as in the other valley, about 6000 feet above the sea.

As we advance further into the Chinese civilisation, we find the river often spanned by the graceful iron-chain suspension-bridges so well known in Ssü-Ch'uan. From five to nine chains are stretched across the river, and on these the roadway is laid; they are wound up and tightened by windlasses in massive piers of masonry or brick; another chain on each side forms a kind of hand-rail, and assists to steady the structure. Across the smaller streams many of the little elegant one-arch stone bridges remind the traveller that he is again in Ssü-Ch'uan.

About 50 miles above Mien-Chou the river is large enough for navigation, and descending to that city with a rapidity quite unknown in land travel, we were again in the plain country. The quiet mountain villages were left behind, and here instead, the towns were big and full of people, numbers of labourers in the fields, coolies on the roads, and traffic on the river. There was an appearance of wealth and prosperity, of life and activity about the country, that contrasted remarkably with the miserable poverty we had left only a few hours before. Sitting in an inn in a noisy town I could hear all the going to and fro in the streets, itinerant vendors selling their wares and crying them out, and the constant chatter of the coolies and the people in the restaurant close by.

The city of Mien-Chou is a large, well-built and important place, protected from floods by very extensive well-built river-walls—the streets nice and clean and free from smells. In the market great quantities of beautiful vegetables were displayed—cabbages as round as cannon-balls, very fine cucumbers, and splendid turnips and bringalls.

Leaving Mien-Chou, everything showed that we had now

struck a great high road; quantities of coolies going both ways, chairs, ponies and numbers of tea-houses by the road-side enlivened the scene. The crops are chiefly Indian corn, beans and ground-nuts; of the last the Chinese make oil, and they are almost as fond of eating them as they are of water-melon seeds, and at all the stalls by the road-side are little piles of some twenty or thirty, which can be bought for a cash or two. There is also a good deal of rice; a great number of melons are grown in the gardens, and quantities of vegetables.

The want of rain had been very severely felt here, some of the rice-fields were quite dry, and the Indian corn looked burnt-up. The people were fasting, beating gongs, and burning incense-sticks, and the south gates of the cities were shut in the hopes of propitiating the skies.

On the top of a little hill was a small temple where a great drumming, beating of gongs, shouting and chanting was going on. Inside, a number of little candles and incense-sticks were burning before several gilded images; there were about a dozen men and boys in the place, all more or less officiating; there was no priest, for the temple did not possess one, but an official servant belonging to an adjacent hamlet, who was well acquainted with the prayers and drill of the proceedings, was standing before the principal altar, reciting the formulæ and giving the signals for the others to say their "Amen." This was done by violent shouting and beating drums and gongs. They seemed very well amused, and as I saw that clouds were gathering, I had no doubt their prayers would turn out efficacious.

At Lo-Chiang-Hsien there was more water, and the rice-crops looked well; but in the undulations that divide the river that waters that town from the Ch'êng-Tu basin, the want of rain was again sadly apparent, some of the rice-fields being quite dry and the soil all cracked.

Amongst these undulations is the pass of the "White Horse," so called after an event that took place in the third century, in the reign of Liu-Pi, a monarch who, from the countless stories that associated with his name are interwoven in the annals of this period, appears to have taken the place in Chinese history assigned to King Alfred in our own. After the disastrous battle when Liu-Pi lost his wife, the king was mounted on a remarkable white horse; his enemies knew this, and were scouring the field in search of him, when his prime-minister, Pong-Tung, or Pong-Chou, riding up, prevailed upon his master to change horses, on the plea that his was the faster of the two. The monarch, whose noble nature, if he had known that the white horse was the object of the chase, would never have con-



sented to the exchange, escaped; Pong-Chou was killed, and buried in a temple at Lo-Chiang-Hsien, where his grave is still shown.

As Ch'êng-Tu is approached the country is again entirely given over to rice-cultivation—the Indian corn disappearing; and as we march westwards there is more and more water, until we again come to the streams running by the road-sides. At Ch'êng-Tu itself there was no want of water, but being the capital of the province, a fast was ordered, and all the usual devout ceremonies were gone through whereby it was hoped that rain would be brought. The drought when I was there was becoming very serious, but I have never heard that it eventuated in a serious famine in this province, though, as we know, the neighbouring one of Shan-Si has been the scene of one of the most appalling calamities that were ever inflicted on a nation.

#### THE ROAD FROM CH'ÈNG-TU TO TA-CHIEN-LU AND BAT'ANG.

The road from Ch'êng-Tu to Ta-Chien-Lu traverses, roughly speaking, two sides of an equilateral triangle. There is, or used to be, a direct road, but it passes through a country much disturbed by fighting amongst or with the aborigines, and for centuries the circuitous route has been considered the great high-road to Tibet.

The plain country is soon left, and 50 miles from Ch'êng-Tu the mountains that stretch from here to the Himalayas are first seen.

There was still in many parts a considerable scarcity of water. The south gates of the city were shut, and the fast proclaimed made it somewhat difficult to obtain food. But still there was here no real distress amongst the people. In times of drought, the Chinese houses being all of wood, conflagrations are much dreaded, and it is customary to shut the south gates of the cities, for the people think that fire can only enter on this side; this idea may have originated in the southern position of the sun. The cultivation is chiefly rice, but as Ya-Chou is approached, it gives way to Indian corn.

The main body of the Min River—only known here as the Southern River—is crossed just beyond Ch'ung-Chou by a bridge which bears on its walls a tablet with the somewhat boastful inscription that it is the finest in Ssü-Ch'uan. This bridge is 240 yards long and  $9\frac{1}{2}$  wide, has 15 arches, and is really a very fine work.

Ya-Chou-Fu is on the River Ya, here 200 yards wide, and

crossed by a ferry. The ferries in China are always free, and their expenses paid from the produce of a piece of land set apart by the Government for the purpose. Here Indian corn is almost the only crop to be seen, and with this the hill-sides are clothed to their very summits. Ya-Chou is a place of great importance, as it is the starting-point of all the commerce to Tibet, to which place tea and cotton are the chief exports.

The most remarkable trade of this place is its commerce in tea, vast quantities of which are sent from here through Tibet and up to the very gates of our own tea-gardens in India. The tea for the Tibetans is merely the sweepings that would elsewhere be thrown away, the poor Chinese in Ya-Chou paying seven or eight times the cost of this for what they drink themselves. It is pressed into cakes about 4 feet long  $\times$  1 foot  $\times$  4 inches, each of which is wrapped in straw, is called a pau, and weighs 24 lbs. The average load for a coolie is about ten or eleven of these packets. I have seen some carrying eighteen—that is 432 lbs. Little boys are constantly seen with five or six pau (120 lbs.). These men wear a sort of frame-work on their backs, which, if the load is bulky, often comes right over the head and forms in rainy weather a protection from the wet. Each of them carries a thing like the handle of a spud, with an iron shoe and point at the end, and when they rest themselves the handle is put under the load, the point into the ground, and thus they relieve their backs from the weight. A coolie gets 1.8 taels to carry 6 pau (144 lbs.) from Ya-Chou to Ta-Chien-Lu, 120 miles over an exceedingly mountainous country; a distance usually accomplished in twenty days. The pay would seem barely enough to keep life in them under their tremendous loads. They eat scarcely anything but Indian-corn bread, made up into round cakes nearly an inch thick, and from 6 to 10 inches in diameter. One or two of these is always seen on the top of their loads.

Beyond Ya-Chou the country becomes gradually more mountainous, until just above Ch'ing-Ch'i, a pass 9300 feet above the sea, is crossed. The climate on the north-eastern face is apparently very wet—the growth of trees, grass, and ferns very luxuriant. Directly the summit is gained the scenery changes, the upper slopes being on this side all covered with grass and wild flowers.

This is called the T'ai-Hsiang-Ling-Kuan, or Great Ministers' Range Pass, and below it lies the city of Ch'ing-Ch'i, chiefly celebrated for its violent winds. When we were here it scarcely belied its reputation; and the day we left my chief impressions of the scenery were violent rains, squalls, mist, and fog. The



road was frightful, and, owing to the rains, I think about the worst I ever saw. Crawling through deep clay along the face of a steep slope cut up by ravines, the crossing of these was a matter of much difficulty and some danger; for in many places the track had been completely carried away by the torrents swollen by the rains. A little further on, in one of the valleys, there are a considerable number of the celebrated insect-trees of Ssü-Ch'uan. This is the tree on which is bred the insect that produces the Chinese white wax. These trees are in appearance like an orange, with a smaller leaf. They have a very small white flower that grows in large sprays, now (20th July) covered with masses of blossom, and the strong smell, which was not very sweet, filled the air. This tree is chiefly grown in the Ning-Yuan-Fu neighbourhood, and the eggs are thence transported towards the end of April to Kia-Ting-Fu, where they are placed on the wax-tree, which is something like a willow. Here the insect emerges from his eggs, and the branch of the tree on which he is placed is soon covered with a kind of white wax secreted. It is this white wax that is so celebrated, and is one of the most valuable products of Ssü-Ch'uan. These eggs cannot be exposed to the heat of the sun, and whilst being carried from the breeding to the producing district, the coolies travel only in the night, when the road is said to present a very remarkable appearance, as the coolies all carry lanterns. Ordinarily in China no travel is done at night; and as the gates of all towns and cities are closed at dusk, and are never opened for anybody, no matter who he may be, travelling at night is rendered impossible. But during the time for bringing the eggs to Kia-Ting-Fu all the city-gates are left open night and day; probably the only exception in China to the rule of shutting the gates at dusk.

The next mountain-range is crossed at a pass called Fei-Yüeh-Ling, or Wu-Yai-Ling (the range without a fork). Although almost precisely the same altitude as the Tai-Hsiang-Ling, the Chinese do not consider this as a mountain of nearly so much importance. Beyond this we enter the country of the aborigines; but they dwell in the mountain-fastnesses, and, until arriving at Ta-Chien-Lu, scarcely anything is seen of them.

From the summit of the Fei-Yüeh-Ling the road descends to the Tung-Ho or Ta-Ho, where again there is a little rice, sago, and bamboo; but soon the main stream is left, and a small tributary ascended, that thunders down a mass of foam from Ta-Chien-Lu, falling 3400 feet in little more than 11 miles.

Ta-Chien-Lu means "Arrow Furnace Forge," and was so

called in the time of the great Liu-Pi. During the third century the barbarians from Tibet invaded China and advanced as far as Ch'iung-Chou. Liu-Pi drove them back; but they made fresh inroads, regaining the country as far as Ta-Chien-Lu. Then Liu-Pi sent against them his redoubtable warrior, Kung-Nung, who coming here forged an arrow-head; he shot this at a rock, and called the place "the arrow furnace forge."

After that the barbarians retreated to Bat'ang, and never since have advanced beyond Ta-Chien-Lu, which may now be considered as the boundary of China, for up to this point the people are directly governed by Chinese; but beyond this there are native chiefs who, subject to China, rule over the people. There is a native king resident here, his territory extends to Ho-K'ou.

Ta-Chien-Lu is situated in a small open valley at the foot of mountains enclosing it on all sides except to the east. The brawling stream that divides the city into two parts is crossed by a wooden bridge, and a good many trees grow about the banks. The streets of the place are narrow and dirty, the shops inferior, and in them are all sorts of strange wild figures, some dressed in a coarse kind of serge or cotton stuff, and wearing high leathern boots, with matted hair or long locks falling over their shoulders; others in greasy skin coats, and the Lamas in red, their heads closely shaved, twisting their prayer-cylinders, and muttering at the same time the universal prayer, "Hoñ-Mane-Pe-mi-Hoñ."

The women wear a good many ornaments, some are good-looking, and all utterly unlike the Chinese in every way.

Both the women and the men wear great quantities of gold and silver ornaments, heavy earrings and brooches, in which are great lumps of very rubbishy turquoise and coral. They wear round their necks charm-boxes; some of gold, others with very delicate filigree work in silver. These are to contain prayers.

During our stay at Ta-Chien-Lu we visited a Lamassery in the neighbourhood, passing on our way large barn-like buildings full of prayer-cylinders turned by water. The prayer written on these is always the same; but on most of them it is repeated many times, so that each revolution counts as many prayers. They all revolve the same way, with the hands of a watch. The Lamassery we visited is finely situated on the edge of a stream at the foot of a big hill, and is surrounded with many fine trees. Outside, the walls are whitewashed and well kept. There is a slight batter to them, and as they look very



thick and massive, there would be something of the appearance of a fortification, if it were not that the windows are large, and outside many of them flowers growing in pots. We entered a quadrangle, on the eastern side of which is the gate. This and two other sides are occupied by living-rooms in two stories, and the fourth—that opposite the entrance—is taken up with the principal chapel. This was not very gorgeous. There was a gigantic statue of Buddha at the end. The Lamas said it was all of brass, but it looked like clay coated with that metal. On each side of this was the tomb of a very sacred Lama, enclosed with iron-wire netting, on which a few scarves of felicity, called “*Khatas*,” were hung. There were seven copper bowls of water before Buddha. We asked if any meaning attached to the number seven, and they replied that there were so many mysteries in it, it was quite impossible of explanation. On each side of the chief chapel is a corridor leading into other rooms, into one of which they showed us. It was very dark, and, as far as we could gather, seemed to portray the horrors of hell. Outside it, hanging from the roof of the corridor, were skins of dogs, deer, bears, and other animals, roughly stuffed with straw. In many of these the sewing had burst and the straw protruded in a melancholy fashion, the hair had fallen off in patches from all of them. Some of them were provided with glass eyes of awful dimensions, and they were fearful objects to look upon. To these also there was some mysterious meaning, but the Lamas would not tell us what it was. We were treated to a cup of tea each, and entertained by one of the chief Lamas, who, in his dress, did not differ from the others. They all have shaven heads, wear a garment of a kind of very coarse red serge or sackcloth over their shoulders. This appears to have no shape, but to be simply an oblong piece of cloth. They wear another length wound round their waist, which forms a skirt reaching to the ankle. Many of them were barefooted; others had high boots of red cloth, with the lower part made of leather. A few wound a yellow scarf round their waists; nearly all kept one arm and shoulder bare. They were without exception exceedingly dirty and smelt abominably.

At Ta-Chien-Lu and all through Tibet the Indian rupee is the current coin; and only those who have gone through the weary process of cutting up and weighing out lumps of silver, disputing over the scale and asserting the quality of the metal, can appreciate the feelings of satisfaction at again being able to make purchases in coin.

These rupees come in thousands all through Tibet, Lassa, and on to the frontiers of China, where merchants eagerly buy them

up, and by melting them down are able to gain a slight percentage. Curious it is, too, to see the wild-looking fellows as well as Chinamen fastening their coats with buttons on which is the image and superscription of Her Most Gracious Majesty; there is scarcely a regiment in our service whose buttons do not find their way into Tibet; the old clothing in India is, I suppose, sold, the buttons bought by Indian traders and carried across the Himalayas, whence they gradually work their way eastwards; lower down, imitation 4-anna pieces are used; these must be made somewhere in England.

From Ta-Chien-Lu the road at once ascends to the great plateau; the ascent is not a severe one—a gradual rise up a valley amongst granite rocks, capped at the summit with bare crags of limestone.

On the road are great droves of yaks, with enormous horns and heads like bisons, huge bushy tails, and hair under their stomachs reaching to the ground. The Tibetan name for the bull is "yak," and for the cow "Jen-Ma." Europeans apply the word "yak" indiscriminately to both sexes, as do the Chinese their word Mao-Niu (hairy cow).

At the summit of Cheh-Toh-Shan, 14,500 feet, there is a huge pile of stones in which are stuck long poles hung with bits of rag; on these are written prayers and inscriptions; the pious always cast a stone on to the heap, and tie a rag to one of the poles in token of thanks for having escaped the terrors of the road. Along every road of Tibet these piles of stones form a most remarkable and conspicuous feature; at close intervals, sometimes only a few hundred yards apart, they would appear to serve as a means for marking the road, when covered by deep snow-drifts, as well as for some pious purpose—each stone in the heap having on it a prayer or inscription. Very frequently, too, across the streams strings will be stretched, and to these 50 or 100 little bits of rag fastened, on which also are written prayers; these they call Mane strings.

From here to Chiamdo there is a direct road not so difficult as the ordinary route; there are on it no Chinese officials, but it is much frequented by traders, who by it reach Chiamdo in 14 days through a well-populated country.

On passing the crest of Cheh-Toh-Shan the great upland country is at once entered. Standing on the summit of the pass, stretched below us was a fine valley, closed in on both sides by gently-sloping round-topped hills, all covered with splendid grass; the richness of the pasture was something astonishing; the ground was yellow with buttercups, and the air laden with the perfume of wild flowers of every description;



wild currants and gooseberries, barberries, a sort of yew, and many other shrubs, grow in profusion. By the side of a little tent some Tibetans were lying about; their fierce dogs tied up to pegs in the ground, and great herds of sheep and cattle grazing round them. The sheep are taken in great flocks once a year from Lit'ang to Ta-Chien-Lu, and thence to Ch'eng-Tu for sale.

A little further on is a hot spring, where the stones were covered with a saline incrustation of soda or potash; the temperature of the water was 111° Fahrenheit, and it was quite black from sulphur. People come here to cure skin diseases, and they say it is very efficacious.

On the banks of the stream that winds through the valley are a few gloomy Tibetan houses, at a distance looking like strong castles; these are great piles of loose stone with scarcely any mortar, sometimes three or four stories high, with little slits of windows like loop-holes. Barley and oats grow well in the valley, but the people do very little but keep cattle, sheep, and horses, or rather ponies, of which there are great numbers, some exceedingly good-looking, with quite an Arab head.

All this valley is covered with wild flowers, from one of which they make a paper like parchment; and there is another that has the most valuable property of killing lice. Caraway grows wild, and is also cultivated.

The road to Lit'ang is a succession of mountains, valleys, huge pine-forests, and open glades. We must hurry through them.

Just before reaching this city the mountain Shie-Gi-La is crossed at an altitude of 14,400 feet. From here gentle slopes lead down about 700 feet to the plain. This is 8 to 10 miles wide, and stretches out for many miles east and west. Opposite, a range of hills bounds the plain; behind it rises the magnificent range of the Surong Mountains, stretching as far as the eye can see to the east and west; snowy peak rising behind snowy peak—where, even at that great distance, vast fields of snow almost dazzle the eye as the sun shines on them.

A river winds through the centre of the valley, numerous streams run down from the mountains on each side, and at this season of the year, when covered with luxuriant grass and wild flowers, one can hardly regret that the excessive cold prevents anything else from growing. No cereals of any kind nor potatoes can be raised; just round the houses at Lit'ang a few half-starved cabbages and miserable turnips appear to be the only things that can be produced.

Lit'ang is a cheerless place, situated at an altitude of 13,300

feet. The people said that it rained here every afternoon in the summer, but that the mornings were generally fine. Though there are only 1000 families here, there is a Lamassery in the city containing 3000 Lamas, and within 5 miles another not much smaller; this Lamassery is adorned with a gilded roof, which has cost a large sum of money, notwithstanding the miserable poverty of the people. Its chief productions are gold, sheep, horses, and cattle; there are 300 Tibetan and 98 Chinese soldiers scattered about the neighbourhood.

The mountain-country beyond Lit'ang is very desolate, rough, undulating ground, in every direction covered with loose stones and huge rocks of granite; low hills backed by jagged peaks, their tops covered with a sprinkling of snow, but not sufficient to hide the barrenness and nakedness of the rocks beneath. At the dreadful summit of Nga-Ra-La-Ka, the mules were a few hundred yards ahead, and we heard the muleteers set up a shout of joy as they gained the highest point. They say that in foggy weather people often swoon here; one of our people seemed to feel the want of oxygen in the air very much, and could hardly drag himself along. This pass is 15,750 feet above the sea; just at the top there were patches of snow lying on the road, but they were very small. After passing the crest we descended over the same dreary wastes of huge blocks of hard whitish-grey granite; this mountain seems much colder than those of sandstone on the other side of the Lit'ang plain, which are of equal height.

After some miles of granite, the road again suddenly strikes the sandstone, and the scenery changes as if by magic; the rounded grassy hills are again entered; a little lower, descending a stream, the pine-clad valleys appear, and the landscape is exactly as it had been on the other side of Lit'ang. As we advance, scene after scene of loveliness meets the unwearied eye—grassy slopes and level plains covered with wild flowers, and forests of noble pines, where Nature in one of her most lavish moods seems to have compensated by the wonderful beauty of the scenery for the short duration of the summer. Suddenly a valley opening out discloses the vast snow-fields of Nen-Da (20,500 feet), and in the quiet of the little hamlet that shares its name, within 5 miles of a point where no living thing shall ever tread, as the setting sun cast its last ray on the summit, I could well appreciate the solemn beauty of the scene. No words of mine can describe the majestic grandeur of that mighty peak, whose giant mass of eternal snow and ice raises its glorious head 7000 feet above the wondering traveller. He can but gaze with admiration and appreciate the feelings of the Tibetans



that have led them to call it Nen-Da, or the Sacred Mountain. As the night fell, clouds gathered round its noble head; next day my eyes no longer rested on the wondrous sight, but, as I rode slowly onwards, the thoughts of it were ever present in my mind, and it was long before the roughness of the track recalled me from the land of dreams to the stern realities of rain and mist.

A few miles of sandstone, and the granite again appearing, the temperature and scenery became cold and dreary.

The natives said Ta-So, the last mountain-pass between us and Bat'ang, was a very bad medicine-mountain. The inconvenience caused by the rarefaction of, and the want of oxygen in, the air at these great altitudes is attributed by them to subtle exhalations, and they always speak of a high mountain as a medicine-mountain. Near the top we found ourselves in a little circular basin, about 100 yards in diameter, surrounded on all sides, except that by which we had come, by steep and ragged precipices 300 feet high. At the bottom was a little pond of clear water; no opening was anywhere visible in the savage walls of rock, but up one side a desperately steep and rough zigzag led to the top. Just over the crest of the pass (16,600 feet) is a great basin 2 miles in diameter, and such a wild and savage scene I never before looked on—a very abomination of desolation. Great masses of bare rock rising all round; their tops perpendicular, torn and rent into every conceivable shape by the rigour of the climate. Long slopes of débris that had fallen from these were at the bottom; and scattered over the flat of the basin, great blocks of rock lay tumbled about in most awful confusion amongst the masses that cropped out from below the surface. Three or four small ponds formed in the hollows were the sources of the stream that, descending from the basin, plunged into another valley, and, falling rapidly, soon became a roaring torrent, dashing through mile after mile of dense pine-forest. The stillness of this place was very remarkable; the air was so rarefied that I could hardly hear the horse's feet only a few yards off, and when quite out of hearing of these, as I walked on alone, the silence was most impressive.

The plain of Bat'ang, described in such glowing terms by Huc, is sadly disappointing. Narrow and treeless, it covers only an area of a few square miles, producing barley, wheat, and Indian corn. Through it a small river, 25 yards wide, runs down 5 miles to the Chin-Sha, there 170 yards to 200 yards wide. The town stands about half a mile from the left bank of the river; it is quite new, having been destroyed a few

years ago in a frightful series of earthquakes that, lasting over many weeks, devastated the whole neighbourhood; it has hardly yet recovered from this disaster, and there are now only 300 families living in 200 houses. Although at an altitude of 8500 feet above the sea, the climate is very warm, and is a remarkable contrast to that of Ta-Chien-Lu, which is situated at almost the same height; the snowy mountains that surround the latter place making it very cold.

Close to the bank of the stream in the midst of the waving corn fields, like the monks of old, the Lamas of Bat'ang have built their Lamassery, and, sheltered by the golden roof that cost upwards of 1000*l.*, 1300 Lamas live in immorality and idleness, a curse to the country and the people; by usury getting possession of, or establishing a lien on, not only nearly all the property, but even the manhood also of the country; living in communities of thousands, issuing forth only for their own amusements or the indulgence of their profligate tastes, they attract to their body all those who, having committed crimes, can only shelter themselves under the cloak of their assumed sanctity. Such are the Lamas who, holding the country in a grasp of iron, are gradually working its ruin and depopulation.

### TO TA-LI-FU.

To insure our safety on the road to A-Tun-Tzū the chief magistrate of Bat'ang came with us to that town, accompanied by the native chief and a large retinue, which day by day increased in number, until on the third march we had 300 men with us; then, when we had reached the place where the great Lassa road branches off, on a high plateau in a storm of wind and sleet the somewhat exciting spectacle lay before us of an encampment of 300 Tibetans turned out by the Lamas to bar the road to the centre of Tibet.

This was the boundary of Tibet proper and beyond it the Chinese appear to have a very slender hold on the country. There the Chinese officials do not issue commands to the native chiefs in a peremptory manner, but when they want anything they make requests; the Bat'ang official himself on our arrival eagerly inquired if I had any rifled cannon in my portmanteau; if I could have given him one, he said, he then could have made the Tibetans say "*La So.*" This is a term used by inferiors to superiors. When the coolies or muleteers came in to ask any favour, they would, according to the customs of the country, go down on their knees, put out their tongues and at



the end of each sentence interpreted to them repeat the word "La So." Protruding the tongue as far as possible is the most respectful Tibetan salutation.

The boundary between Yün-Nan and Bat'ang is crossed at the Tsa-Leh mountain 15,800 feet above the sea. This is also the water-parting between the two rivers, the Lan-Ts'ang and Chin-Sha. The country gradually descends from this point, the scenery changes and the climate becomes warmer.

A-Tun-Tzū (11,000 feet), on the western slope of the mountains, is a Chinese town, but the people are still thoroughly Tibetan, even the Chinese talking Tibetan better than their own language. The prevalence of goitre in these districts is something appalling; some attribute it to the water, others to the salt, but, whatever the cause, two-thirds of the population have swellings on their throats, some of enormous size.

All the country between the two rivers is covered with forests in which there were many wild beasts—amongst others, wild oxen and monkeys were reported.

Some of the mountaineers below A-Tun-Tzū were most hospitable, treating us everywhere with the greatest respect, and sparing no pains to render us comfortable; a few of the chiefs live in really good houses, which were always at our disposal.

From A-Tun-Tzū the road again passes over to the Chin-Sha Chiang and follows it for two or three days, after which it crosses another ridge and descends to the city of Ta-Li-Fu.

The country for many miles round this city still bears the traces of the Mahometan rebellion; ruined villages and terraced hill-sides, where now no crops are raised, attest the sparseness of the population. Ssü-Ch'uan is over-populated, and a very little Government assistance would enable the people to emigrate to this province; this, however, they cannot obtain, and it must be a long time before this beautiful and naturally wealthy country can again become a flourishing one.

Ta-Li-Fu itself is now, with its ruined houses, a melancholy place, and its dreariness was not lessened by the pitiless rain that descended in a continuous stream day and night for the few days of our stay; for many days before reaching this city we had been almost always marching in heavy rain, and the valleys were now all flooded—so much so that the rice crop was lost, and in Ta-Li-Fu I saw myself the young rice, on which the ear had hardly formed, being sold in the streets as green fodder for animals.

## TO TÊNG-YUEH.

From Ta-Li we followed in the footsteps of Mr. Margary, and the expedition that was sent to inquire into the circumstances of his death. Wherever we went and whoever it might be that spoke of Mr. Margary, he was always referred to in terms of almost affectionate regard, and, standing at the scene of his cruel murder, I could not but feel what a loss the country had sustained in that brilliant young officer, who, through sickness and the difficulties surrounding a pioneer in new and untravelled districts, had not only carried out with singular tact the delicate duties entrusted to him, but had also known how to portray in striking and vivid colours the many new scenes presented to his view, and to leave a faithful and lasting record of the strange peoples and countries through which he passed as a legacy to his regretful countrymen.

I lifted my hat as the only tribute of respect I could pay to one whose memory will long be dear to the hearts, not only of those who knew him, but of all who value the noble qualities of uprightness, courage and determination.

Perhaps the most remarkable geographical feature between Ta-Li and Bhamo is the deep gorge through which the River Lan-Ts'ang runs, and which is better appreciated from the horizontal section on the map than from explanation. This river is described by Cooper as possessing, higher up, the same characteristics. The ascent to the westward from it is perhaps one of the worst and most severe of all these mountain roads; beyond, in a fine and extensive plain, lies the city of Yung-Ch'ang, the Vochan of Marco Polo.

In the neighbourhood of this city enormous pears are raised. I weighed two of them ( $1\frac{1}{2}$  lb. and 3 lbs.). These were not uncommon. Near here the salt that is made into cakes of many shapes and sizes might still be described in Polo's words as like a twopenny loaf.

The direct road from Yung-Ch'ang was pronounced impracticable, owing to the fact that it passes over a plain entirely depopulated by the plague that appears every year in June or July. In describing the symptoms to me, the people said that a lump like a boil, about the size of half a small walnut, suddenly appeared on almost any part of the body; there was absolutely no attendant pain, and twenty-four hours was the outside that a person could live after the appearance of this lump.

Boccaccio thus describes some of the symptoms of plague at Florence in 1348 :—"Here there appeared certain tumours in



the groin or under the arm-pits, some as big as a small apple, others as an egg. But they generally died the third day from the first appearance of the symptoms, without a fever or other bad circumstance attending."

From Defoe, also, may be gathered that the plague of London was somewhat similar; but he was not himself an eye-witness of this terrible calamity, nor does he anywhere give a distinct account of the symptoms.

Near Yung-Ch'ang, my informant said that during July, August, and September, more than 1000 people died of this complaint. A traveller who had passed the stricken districts in July said there were scarcely any inhabitants left, and that the dead bodies were lying about unburied; he added that the disease had moved southwards, and was raging in another district.

Beyond Yung-Ch'ang is the valley of the Lu-Chiang, so unhealthy that no stranger can at any time sleep here (so they say) without getting fever. In the summer months it is quite impassable, even the inhabitants leave it, and ascend to the mountains. The miasma that rises is said to be a reddish mist; the ordinary white mist that I often saw hanging over the valleys in this neighbourhood is said to be harmless.

We were fortunate in the time of our passage, and the sun shone brightly as we crossed the curious suspension-bridge that spans the river. It is in two spans of 73 and 52 yards; but for greater ease in tightening up the chains, the two are not in the same straight line. In construction each span is identical with that I have already described.

In rainy variable weather at no season of the year will any one attempt the passage of this valley; and Marco's words, "So unhealthy that no stranger can pass in the summer-time," were brought strongly to my mind.

At Man-Yün, or, as is usually called, Manwyne, we were delayed for weather. This (end of October) was not the regular rainy season in which no traffic of any kind is ever thought of; but, nevertheless, three consecutive days and nights of heavy rain made the muleteers refuse to attempt the onward journey.

But little traffic was met with on the almost uninhabited country to Bhamo, where Mr. Cooper, himself "one of the most adventurous of travellers," knew well from experience how best to administer the hospitality to which he was prompted by his sympathetic and kindly heart.

Here coolies, mules, and ponies were left behind, and coal

and iron swiftly bore us down the broad bosom of the Irawaddy to home and civilisation.

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#### EXPLANATION OF THE TABLES.

It will be observed that the altitudes as given in these Tables differ considerably from those published in the 'Proceedings.'\*

This arises from the fact that, when I had the honour of reading my Paper, I had not had time to make the necessary computations.

Immediately on my return to England I sent my hypsometric thermometers to Kew for verification; the errors so obtained were applied to every hypsometric reading taken during my journey, and the correct barometric pressure deduced from each of these observations.

It was then necessary by the assistance of these to correct every aneroid observation taken during a period of eight months.

When halting, the aneroid was noted three times a day; on the march as often as ten or a dozen times during the day's journey.

From these corrected readings the altitudes of 330 places have been finally computed. It will be readily understood that this has been a work of time; and that when I read my Paper it had hardly been commenced.

It was, however, necessary for me to give some idea of the conformation of the ground that I had traversed.

I therefore put the altitudes down from the barometric readings, without any corrections for temperature, and assuming 30 inches as the barometric pressure at the sea-level.

To have done more than this, unless the work had been thoroughly completed, would only have been a waste of time, as it would have been necessary to make all the computations afresh.

In some instances the correction for temperature alone makes a difference of 800 feet in the altitude: the discrepancies between the altitudes, as given in the 'Proceedings' and as they now appear, will therefore be readily understood.

During my journey from Ch'êng-Tu I made thirty-three hypsometric observations, each with two thermometers; and until one was broken I always used three.

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\* 'Proceedings,' Royal Geographical Society, vol. xxii., page 255 *et seq.*  
VOL. XLVIII.



TABLE I. gives (a) the boiling-points deduced from these, by the aid of the final corrections from Kew Observatory. I may say that these were so trifling as to be hardly worth the trouble of applying, in consideration of the many much greater sources of error in computing altitudes from barometric observations.

(b). The correct height of the barometer deduced from the corrected boiling-points.

(c). The readings of the aneroids at the times and places of the hypsometric observations.

(d). The errors of the same aneroids at the same times.

By the aid of these errors, corrections have been applied to upwards of 300 aneroid readings.

TABLE II. gives (e) the corrected barometer at every station.

(f). The temperature of that station.

(g). The barometric readings at sea-level, on the dates on which observations were made.

(h). The thermometric readings at sea-level, on the same dates.

(k). The approximate latitudes. As the objects of these latitudes are merely to compute the altitudes, they are only given to the nearest degree.

(l). The altitudes above the level of the sea, in English feet, deduced from these observations.

(m). Mr. Baber's altitudes, as computed by himself, of several places whose altitudes have also been found by me.

(n). Mr. Baber's observations, at the same places, re-computed; using the same datum as I used myself, viz. the mean of Shanghai and Calcutta.

(e). The daily mean of the barometer and thermometer occurs generally at about 9 A.M.; but in travelling, when one hasty reading at any time of the day and in all sorts of weathers is all that can be obtained, it is of course impossible to form any idea as to whether the barometer is above or below the daily mean. No correction for this purpose has been attempted.

At the halting-places several readings were always taken, and the mean of these has been adopted.

At Ch'èng-Tu and at Ta-Chien-Lu the halts were sufficiently long to give some idea of the daily variation. Some more remarks on these places will be found further on.

(f). The temperature. To obtain altitudes with any degree of accuracy, the mean daily temperature is necessary; it is fortunately easier to approximate to this than to the mean daily barometric pressure.

From my own observations I have adopted what would seem to be a fair mean for each place.

(g) and (h). Mr. Coles, the Curator of Maps at the Royal Geographical Society, has been at much trouble to assist me in all this work. He obtained for me the mean barometric and thermometric readings for each month at Calcutta and Shanghai. Between these I have roughly interpolated daily readings.

For my datum I have taken the mean of Calcutta and Shanghai. Both these places lie on latitude  $30^{\circ}$  (approximately), and my route was not far from the same parallel. It would seem therefore safe to assume that this is as good a datum as can be obtained.

Many altitudes have been computed separately by Calcutta and Shanghai. It must be confessed that the large differences are not satisfactory; and it will be observed that Calcutta always gives a less altitude than is given by Shanghai.

I am quite unable to explain the fact.

(l). The altitudes have been deduced by Baily's formula. These have been computed by Lieutenant Selwyn S. Sugden, R.N., to whom I cannot give sufficient thanks for the care and rapidity with which he has carried out the laborious task.

(m). Mr. Baber's altitudes have been taken from his own report.

(n). As Mr. Baber worked entirely from Shanghai as datum, I thought it would be interesting to compute a few of his observations, using the datum that I used myself. The agreement cannot be considered satisfactory; but the weather at the time of my visit was very unsettled, and the great variations no doubt had considerable influence on the barometric pressure.

TABLE III. gives the results of observations at Ch'êng-Tu, Ta-Chien-Lu, Bat'ang, and Bhamo.

At Ch'êng-Tu, from the 10th to 18th May, observations were regularly taken at 9 A.M., 3 P.M., and 9 P.M.

The mean of the 9 A.M. and 9 P.M. observations has been taken as the mean of the period.

The altitudes have been calculated separately, using Shanghai and Calcutta.

From 21st June to 9th July similar observations were taken, and similarly computed.

The mean of the four values thus obtained has been adopted as the altitude of Ch'êng-Tu.

At Ta-Chien-Lu, from 25th July to 7th August, the same operations have been performed.



At Bat'ang I had the pleasure of making the acquaintance of the Abbé Desgodins. He had kept a meteorological register daily during the months of November and December, 1876, and January, February, June, and July, 1877. He most kindly gave me a copy of his observations.

I ascertained the index-error of his barometer, and have applied it to his readings.

His barometric observations were taken at 9 A.M. and 4 P.M. I have used the 9 A.M. observations only, as being the nearest to the mean.

I have worked the observations of every month separately, each with Shanghai as well as Calcutta, thus getting twelve values for the altitude of Bat'ang. The differences are very great, but it may be assumed that the mean is not far from the true altitude.

TABLE IV. This is a comparison of results obtained by using Shanghai and Calcutta as data. In order to make the comparison more complete, several of Mr. Baber's observations have been recalculated and contrasted with my own.

The fact that Calcutta always gives a less altitude than Shanghai is very marked.

The hypsometric observations were made with Mr. Casella's Alpine Hypsometric Apparatus. This instrument proved invaluable. I used it on one occasion at an altitude of upwards of 16,000 feet, and it never gave me any trouble.

TABLE I.

Place.	Date.	a. Corrected Boiling- point.	b. Deduced Barometer.	c. Reading of Baro- meter, 229.	d. Error of Barometer, 229.	e. Reading of Baro- meter, 306.	f. Error of Barometer, 306.
Shan-Tou-Ping ..	March 11	212.65	30.31	30.60	-0.29	30.52	-0.21
On a mountain ..	March 18	208.12	27.69	..	..	27.90	-0.21
Ch'ing-She-Kou ..	March 18	211.73	29.76	29.74	+0.02	29.76	0.00
Lo-Chi .. ..	April 6	210.82	29.23	29.26	-0.03	29.38	-0.15
Ch'ung-Ch'ing, Mr. Baber's house ..	April 22	210.23	28.89	28.85	+0.04	29.06	-0.17
Ch'eng-Tu .. ..	May 12	208.90	28.128	28.04	+0.088	28.27	-0.142
Ditto .. ..	May 14	209.12	28.253	28.13	+0.123	28.38	-0.127
Ditto .. ..	May 17	209.54	28.51	28.39	+0.12	28.69	-0.18
Li-Fan-Fu .. ..	May 25	202.46	24.68	24.50	+0.18	24.78	-0.10
Mao-Chou .. ..	May 29	202.90	24.90	24.60	+0.30	25.02	-0.12
Sha-Wan .. ..	June 1	199.50	23.21	22.90	+0.31	23.00	+0.21
Sung-P'an-T'ing ..	June 5	195.50	21.35	20.98	+0.37	20.98	+0.37
Ch'eng-Tu .. ..	June 25	208.77	28.06	27.81	+0.25	27.75	+0.31
Ch'ing-Ch'i-Hsien ..	July 18	202.07	24.48	23.80	+0.68	23.90	+0.58
I-T'ou-Ch'ang ..	July 20	203.03	24.97	24.50	+0.47	24.60	+0.37
Hua-Ling-P'ing ..	July 22	199.47	23.20	22.50	+0.70	22.60	+0.60
Ta-Chien-Lu .. ..	July 31	197.034	22.07	21.52	+0.55	21.52	+0.55
Ditto .. ..	Aug. 6	197.16	22.10	21.40	+0.70	21.56	+0.54
Cheh-Toh .. ..	Aug. 7	193.05	20.27	19.55	+0.72	19.70	+0.57
Cheh-Toh-Shan ..	Aug. 8	186.923	17.78	..	..	17.13	+0.65
La-Ni-Ba .. ..	Aug. 14	187.227	17.90	..	..	17.10	+0.80
Li'ang .. ..	Aug. 18	188.613	18.44	17.12	+1.32	17.45	+0.99
Jiom-Bu-T'ang ..	Aug. 19	186.258	17.52	16.24	+1.28	16.60	+0.92
Dzong-Da .. ..	Aug. 20	186.138	17.48	..	..	16.58	+0.90
San-Pa, or Ra-Ti ..	Aug. 23	187.994	18.19	16.82	+1.37	17.35	+0.84
Ta-So, or Ta-Shiu ..	Aug. 24	188.816	18.52	17.10	+1.42	17.64	+0.88
400 feet below the summit of Ta-So-Shan .. ..	Aug. 24	183.839	16.63	..	..	15.70	+0.93
Bat'ang .. ..	{ Aug. 28 9 A.M. }	196.895	21.99	20.75	+1.24	21.00	+0.99
Ditto .. ..	{ Aug. 28 3 P.M. }	196.48	21.80	20.51	+1.29	20.71	+1.09
Kong-Tze-Ka .. ..	Aug. 31	191.422	19.59	18.42	+1.17	18.72	+0.87
Tsa-Leh .. ..	Sept. 4	189.970	18.98	17.75	+1.23	18.16	+0.82
A-Tun-Tzu .. ..	Sept. 8	192.630	20.10	18.78	+1.32	19.12	+0.98
Sha-Lu .. ..	Sept. 12	195.655	21.42	20.20	+1.22	20.51	+0.91
N'doh-Sung .. ..	Sept. 14	198.693	22.83	21.49	+1.34	21.81	+1.02
Chi-Tien .. ..	Sept. 19	201.183	24.04	22.85	+1.19	23.22	+0.82
Ta-Li-Fu .. ..	Oct. 2	200.296	23.603	22.50	+1.103	22.98	+0.623
Yung-Ch'ang-Fu ..	Oct. 13	202.256	24.58	23.50	+1.08	24.10	+0.48
T'eng-Yüeh-T'ing ..	Oct. 19	202.316	24.60	23.64	+0.96	24.02	+0.58



TABLE II.

Date.	Place.	e.	f.	g.	h.	k.	l.	m.	n.
		Corrected Mean Barometer.	Cor- rected Mean Tempe- rature.	Corrected Mean Barometer, Sea Level.	Cor- rected Mean Tempe- rature, Sea Level.	Latitude.	Deducted Altitude, English Ft.	Mr. Baber's Deducted Altitude.	Mr. Baber's Altitude re-calculated, using the mean of Shanghai and Calcutta as Datum.
May 17	Pi-Hsien	27.98	66	29.77	77	31° N.	1,765		
" 19	Ngan-Ts-P'u	27.97	66	29.77	77	"	1,776		
" 19	Kuan-Hsien	27.41	66	29.76	77	"	2,347		
" 21	Yu-Ch'i	27.09	65	29.75	78	"	2,670		
" 21	Summit of Pass	25.13	62	29.75	78	"	4,808		
" 21	Yin-Hsiao-Wan	26.60	64	29.75	78	"	3,187		
" 22	Hsin-Wen-P'ing	26.55	64	29.75	78	"	3,241		
" 22	River level, 43 m. beyond Hsin-Wen-P'ing	26.42	64	29.75	78	"	3,382		
" 22	River level, 8 m. beyond Hsin-Wen-P'ing	26.20	64	29.75	78	"	3,619		
" 23	T'ao-Kuan	26.20	64	29.75	78	"	3,623		
" 23	Wen-Ch'uan	25.94	63	29.75	78	"	3,899		
" 23	Pan-Ch'iao	25.60	63	29.75	78	"	4,275		
" 24	Hsin-P'u-Kuan	25.49	63	29.75	78	32°	4,398		
" 24	Ku-Ch'ang	25.05	62	29.75	78	"	4,888		
" 25	Kan-Ch'i	25.11	62	29.74	78	"	4,821		
" 25	Li-Fan-Fu	24.68	62	29.74	78	"	5,312		
" 26	Ditto	24.76	62	29.73	78	"	5,200		
" 26	Mantzu Village	22.81	58	29.73	78	"	7,475		
" 27	Wen-Cheng	25.23	63	29.73	78	"	4,670		
" 28	Pat-Shui-Chai	25.20	62	29.72	79	"	4,694		
" 28	Ditto	25.18	62	29.72	79	"	4,717		
" 28	Mao-Chou	24.877	59	29.72	79	"	4,996		
" 30	Wei-Men-Kuan	24.80	59	29.71	79	"	5,123		

30	Ch'a-Erh-Ngai	..	..	..	24.54	59	29.71	79	..	5,423
31	Ditto	..	..	..	24.82	59	29.70	79	..	5,091
31	Mu-Su-P'u	..	..	..	24.78	59	29.70	79	..	5,137
31	Ditto	..	..	..	24.65	59	29.70	79	..	5,344
31	Ta-Ting	..	..	..	24.15	59	29.70	79	..	5,869
June 1	Ditto	..	..	..	24.21	59	29.70	79	..	5,798
1	Ditto	..	..	..	24.26	59	29.70	79	..	5,739
1	Village, 2½ m. beyond Ta-Ting	..	..	..	23.21	58	29.70	79	..	6,988
1	Shui-Kou-Tzu	..	..	..	23.25	58	29.70	79	..	6,940
1	Highest point on road, 2½ m. beyond Shui-Kou-Tzu	..	..	..	22.41	57	29.70	79	..	7,975
1	Tieh-Chi-Ying	..	..	..	22.52	57	29.70	79	..	7,837
1	Sha-Wan	..	..	..	23.18	57	29.70	79	..	7,017
2	P'ing-Ting-Kuan	..	..	..	22.84	55	29.70	79	..	7,436
2	Cheng-P'ing-Kuan	..	..	..	22.53	55	29.70	79	..	7,807
3	Chen-Chiang-Kuan	..	..	..	22.25	55	29.70	79	..	8,159
3	Lang-Tan-P'u	..	..	..	21.77	50	29.70	79	..	8,729
4	Ngan-Hua-Kuan	..	..	..	21.53	50	29.69	79	33°	9,032
6	Sung-P'an-T'ing	..	..	..	21.19	50	29.69	79	..	9,470
6	Saddle, 2½ m. beyond Sung-P'an-T'ing	..	..	..	20.33	50	29.68	79	..	10,036
6	At an Inn, 6½ m. beyond Sung-P'an-T'ing	..	..	..	20.48	55	29.68	79	..	10,484
6	Hsieh-Lan-Kuan	..	..	..	20.17	52	29.68	79	..	10,881
7	Peng-Tung-Kuan	..	..	..	19.43	48	29.68	79	..	11,884
7	Pass Hsieh-Shan	..	..	..	18.55	46	29.67	79	..	13,148
7	Hung-Ngai-Kuan	..	..	..	20.40	50	29.67	79	..	10,529
7	Cheng-Yuan	..	..	..	21.56	55	29.67	79	..	9,021
8	Yueh-Erh-Ngai	..	..	..	22.48	59	29.67	79	..	7,874
8	On the road, 6½ m. beyond Yueh-Erh-Ngai	..	..	..	23.54	60	29.67	79	..	6,574
8	Shih-Chia-P'u	..	..	..	24.04	63	29.67	79	..	5,995
9	Hsiao-Ho-Ying	..	..	..	24.65	65	29.67	79	..	5,297
9	Yeh T'ang	..	..	..	25.49	67	29.67	79	..	4,339
10	Shui-Ching-P'u	..	..	..	25.82	68	29.66	80	..	3,962
10	Shui-Chin-Chan	..	..	..	26.08	68	29.66	80	..	3,675
11	Ko-Ta-Pa	..	..	..	26.35	68	29.66	80	32°	3,391
12	Ti-Tzu-Yi	..	..	..	26.45	68	29.66	80	..	3,283



TABLE II.—continued.

Date.	PLACE.	e.	f.	g.	A.	h.	i.	m.	n.
		Corrected Mean Barometer.	Cor- rected Mean Tempe- rature.	Corrected Mean Barometer, Sea Level.	Cor- rected Mean Tempe- rature, Sea Level.	Latitude.	Deducted Altitude, English Ft.	Mr. Baber's deduced Altitude.	Mr. Baber's Altitude re- calculated, using the Mean of Shanghai and Calcutta as Datum.
June 12	Tieh-Lung-Kuan ..	26.59	68	29.65	80	32°	3150		
" 12	Lung-An-Fu ..	26.63	73	29.65	80	"	3094		
" 13	Ku-Ch'ang ..	26.82	73	29.65	80	"	2890		
" 13	Kuang-Yi ..	26.90	75	29.65	80	"	2811		
" 14	Hei-Shui-Kou ..	27.00	77	29.64	80	"	2700		
" 14	Chin-Chou ..	27.13	77	29.64	80	"	2560		
" 15	Hsiang-Ngai-Pa ..	27.27	77	29.64	80	"	2412		
" 15	P'ing-I-P'u ..	27.22	77	29.64	80	"	2464		
" 16	Chiang-Yu-Hsien ..	27.45	77	29.64	80	"	2211		
" 16	Chung-Pa-Ch'ang ..	27.59	77	29.64	80	"	2064		
" 17	Chang-Ming-Hsien ..	27.70	77	29.63	80	"	1949		
" 17	In boat ..	27.76	77	29.63	80	"	1887		
" 17	Mien-Chou ..	27.73	77	29.63	80	31°	1918		
" 18	Hsin P'u ..	27.57	77	29.62	81	"	2078		
" 18	Lo-Chiang-Hsien ..	27.61	77	29.62	81	"	2033		
" 19	Te-Yang-Hsien ..	27.66	77	29.62	81	"	1983		
July 10	Ch'eng-Tu ..	"	"	"	"	"	1504		
" 10	Tau-Ch'iao ..	28.07	81	29.63	83	"	1575		
" 10	Shuang-Liu-Hsien ..	28.00	81	29.63	83	"	1647		
" 11	Hun-Ch'iao-Tsu ..	28.11	81	29.63	83	"	1532		
" 11	Hsin-Chin-Hsien ..	28.05	81	29.63	83	"	1595		
" 12	Yang-Chin-Ch'ang ..	28.06	81	29.63	83	"	1585		
" 12	Tea House, 8½ m. beyond Yang-Chin-Ch'ang ..	27.91	81	29.63	83	"	1740		

12	Ch'ing-Chou	..	..	..	..	28.01	81	29.63	83	30°	1637
13	Ta-T'ang-P'u	..	..	..	..	27.94	75	29.63	83	"	1681
13	Pai-Chang-Yi	..	..	..	..	27.71	75	29.63	83	"	1920
14	Ming-Shan-Hsien	..	..	..	..	27.96	75	29.63	83	"	1660
14	Chin-Chi-Kuan or Golden Pleasant Pass	..	..	..	..	27.60	75	29.63	83	"	2036
14	Ya-Chou-Fu	..	..	..	..	27.95	75	29.63	83	"	1671
15	Tzu-Shih-Li	..	..	..	..	27.63	75	29.63	83	"	2004
15	Kuan-Yin-P'u	..	..	..	..	27.17	74	29.63	83	"	2484
16	Fel-Lung-Kuan	..	..	..	Summit	26.15	73	29.63	83	"	3583
16	Shih-Chia-Ch'iao	..	..	..	..	27.45	75	29.63	83	"	2190
16	Yung-Ching-Hsien	..	..	..	..	27.35	75	29.63	83	"	2299
17	Ching-K'ou-Chan	..	..	..	..	27.00	74	29.64	84	"	2670
17	Huang-Ni-P'u	..	..	..	..	26.03	73	29.64	84	"	3725
18	About the last bamboo, 1½ m. beyond Huang-Ni-P'u	..	..	..	..	25.66	73	29.64	84	"	4152
18	Where stream is left, 1½ m. beyond Huang-Ni-P'u	..	..	..	..	25.31	73	29.64	84	"	4545
18	Hsiao-Kuan	..	..	..	..	25.07	73	29.64	84	"	4809
18	Cross river, 1 m. beyond Hsiao-Kuan	..	..	..	..	24.80	73	29.64	84	"	5123
18	Ta-Kuan	..	..	..	..	24.25	71	29.64	84	"	5754
18	At a village, 2½ m. beyond Ta-Kuan	..	..	..	..	23.20	65	29.64	84	"	6973
18	T'ai-Hsiang-Ling-Kuan	..	..	..	Summit	21.30	60	29.64	84	"	9396
18	Wild Bamboo, Holly, First cultivation of tobacco—at village, 1½ m. beyond T'ai-Hsiang-Ling-Kuan	..	..	..	..	22.48	60	29.64	84	"	7840
18	First Indian corn—at village, 2½ m. beyond T'ai-Hsiang-Ling-Kuan	..	..	..	..	22.99	60	29.64	84	"	7187
18	Ch'ing-Ch'i-Hsien	..	..	..	..	24.48	71	29.61	84	"	5478
18	½ m. beyond Ch'ing-Ch'i-Hsien	..	..	..	..	24.76	71	29.64	84	"	5156
19	2½ m. beyond Ch'ing-Ch'i-Hsien	..	..	..	..	24.18	71	29.64	84	"	5842
19	4 m. beyond Ch'ing-Ch'i-Hsien	..	..	..	..	24.72	71	29.64	84	"	5202
19	Fu-Hsing-Ch'ang	..	..	..	..	25.90	73	29.64	84	"	3873
20	Pan-Chin-Ngai	..	..	..	..	25.54	73	29.64	84	"	4279
20	I-Tou-Ch'ang	..	..	..	..	24.99	71	29.64	84	"	4882
21	Kao-Ch'iao	..	..	..	..	24.04	71	29.64	84	"	6002
21	San-Ch'iao-Ch'eng	..	..	..	..	24.19	71	29.64	84	"	5830
21	Village with bamboo, ½ m. beyond San-Ch'iao-Ch'eng	..	..	..	..	24.17	71	29.64	84	"	5853



TABLE II.—continued.

Date.	Place.	e.	f.	g.	h.	k.	l.	m.	n.
		Corrected Mean Barometer.	Cor- rected Mean Tempe- rature.	Corrected Mean Barometer, Sea Level.	Cor- rected Mean Tempe- rature, Sea Level.	Latitude.	Deduced Altitude.	Mr. Baber's Deduced Altitude.	Mr. Baber's Altitude re-calculated, using the mean of Shanghai and Canton as Datum.
July 21	Village, 2½ m. beyond San-Ch'iao-Ch'eng	23.51	68	29.64	84	30°	English Ft. 6629		
" 21	Village, 4½ m. beyond San-Ch'iao-Ch'eng	22.50	64	29.64	84	"	7,850		
" 21	Fei-Yueh-Ling, or Wu-Yai-Ling Pass	21.60	60	29.64	84	"	9,022		
" 21	1 m. beyond Fei-Yueh-Ling	22.34	64	29.64	84	"	8,055		
" 21	1 m. beyond Fei-Yueh-Ling	22.60	64	29.64	84	"	7,730		
" 21	Hua-Lin-P'ing	23.15	68	29.64	84	"	7,073		
" 22	1 m. beyond Hua-Lin-P'ing	23.39	68	29.64	84	"	6,805		
" 22	1 m. beyond Hua-Lin-P'ing	23.94	68	29.64	84	"	6,107		
" 22	1 m. beyond Hua-Lin-P'ing	23.95	68	29.64	84	"	6,095		
" 22	1½ m. beyond Hua-Lin-P'ing	23.92	68	29.64	84	"	6,132		
" 22	1½ m. beyond Hua-Lin-P'ing	24.49	71	29.64	84	"	5,472		
" 22	2 m. beyond Hua-Lin-P'ing	24.80	71	29.64	84	"	5,107		
" 22	3½ m. beyond Hua-Lin-P'ing—First rice cultivation	24.91	71	29.64	84	"	4,976		
" 22	Leng-Chi	25.23	73	29.64	84	"	4,633		
" 23	Lu-Ting-Ch'iao	25.24	74	29.65	84	"	4,640		
" 24	Haino-P'eng-Pa	25.24	76	29.65	84	"	4,633		
" 24	Wa-Sai-Kou	25.00	76	29.65	84	"	4,933		
" 25	L'in-Yang	23.58	64	29.65	84	"	6,570		
" 25	Ta-Chien-Lu	"	"	"	"	"	8,346		
Aug. 7	Cheh-Toh	20.25	58	29.69	85	"	10,838		
" 8	Cheh-Toh-Shan	17.78	56	29.69	85	"	14,515		
" 8	Hsin-Tien-Chan, or Ti-Zu	18.53	56	29.69	85	"	13,335		
" 8	1½ m. beyond Hsin-Tien-Chan—First cultivation	18.72	56	29.69	85	"	13,131		

8	An-Niang	..	..	..	..	..	19.13	55	29.69	85	..	12,413
9	Ngoloh	..	..	..	..	..	19.44	59	29.70	84	..	12,027
11	3½ m. beyond Ngoloh—End of cultivation	..	..	..	..	..	19.22	56	29.70	84	..	12,377
11	4½ m. beyond Ngoloh	..	..	..	..	..	18.87	56	29.70	84	..	12,903
11	La-Tza	..	..	..	..	..	18.73	56	29.70	84	..	13,040
11	Ku-Ji-La	..	..	..	..	Summit	17.80	54	29.70	84	..	14,454
11	Do-Ku-La-Tza	..	..	..	..	Summit	17.71	54	29.70	84	..	14,597
11	Wu-Rum-Shih	..	..	..	..	..	19.43	60	29.70	84	..	12,048
12	Ker-Rim-Bu, or Pa-Ko-Lo (octagon tower)	..	..	..	..	..	20.62	65	29.71	84	..	10,835
12	Nia-Chu-Ka, or Ho-K'ou, the Ya-Lung River	..	..	..	..	..	21.51	65	29.71	84	..	9,922
13	Ma-Geh-Chung	..	..	..	..	..	19.49	60	29.71	84	..	11,971
14	2½ m. beyond Ma-Geh-Chung	..	..	..	..	..	18.92	56	29.71	83	..	12,815
14	4½ m. beyond Ma-Geh-Chung—Above the pines and oaks	..	..	..	..	..	17.88	55	29.71	83	..	14,413
14	Ra-Ma-La	..	..	..	..	Summit	17.52	54	29.71	83	..	14,915
14	La-Ni-Ba	..	..	..	..	..	17.90	56	29.71	83	..	14,335
14	Ra-Ma-La	..	..	..	..	Second summit	17.39	54	29.71	83	..	15,110
14	Lit'ang-Ngoloh	..	..	..	..	..	19.16	59	29.71	83	..	12,451
16	Nin-Chang	..	..	..	..	..	18.12	50	29.72	83	..	13,900
16	Tang-Gola	..	..	..	..	Summit	17.93	45	29.72	83	..	14,109
16	Zou-Gunda	..	..	..	..	..	18.55	50	29.72	83	..	13,255
16	Deh-Re-La	..	..	..	..	Summit	17.63	45	29.72	83	..	14,584
16	On a spur, 1½ m. beyond Deh-Re-La	..	..	..	..	..	17.86	55	29.72	83	..	14,455
16	In the valley, 3¼ m. beyond Deh-Re-La	..	..	..	..	..	18.07	50	29.72	83	..	13,977
16	Wang-Gi-La	..	..	..	..	Summit	17.03	45	29.72	83	..	15,558
16	Ho-Chu-Ka	..	..	..	..	..	18.54	50	29.72	83	..	13,250
17	5½ m. beyond Ho-Chu-Ka	..	..	..	..	..	18.46	50	29.72	83	..	13,392
17	Shie-Gi-La	..	..	..	..	Summit	17.73	45	29.72	83	..	14,425
17	Lit'ang	..	..	..	..	..	18.52	50	29.72	83	..	13,280
19	Jion-Bu-Tang	..	..	..	..	..	17.55	45	29.73	83	..	14,718
20	Nga-Ra-La-Ka	..	..	..	..	At the Pond	17.07	45	29.73	83	..	15,499
20	Nga-Ra-La-Ka	..	..	..	..	Summit	16.91	45	29.73	83	..	15,753
20	Dzong-Da	..	..	..	..	..	17.49	50	29.73	83	..	14,896
20	Summit of small ridge	..	..	..	..	..	17.50	50	29.73	83	..	14,881
20	La-Ma-Ya	..	..	..	..	..	18.88	55	29.73	83	..	12,826



TABLE II.—continued.

Date.	Place.	e.	f.	g.	h.	k.	l.	m.	n.
		Corrected Mean Barometer.	Cor- rected Mean Tempe- rature.	Corrected Mean Barometer, Sea Level.	Cor- rected Mean Tempe- rature, Sea Level.	Latitude.	Reduced Altitude.	Mr. Baber's Reduced Altitude.	Mr. Baber's Altitude re-calculated, using the Mean of Shanghai and Calcutta as Datum.
Aug. 21	Ye-La-Ka .. ..	17.96	51	29.73	83	30°	English Ft. 14,246		
" 21	Dzeli-Dzang-Chü .. ..	18.65	55	29.73	83	"	13,162		
" 21	Mang-Ga-La .. ..	18.47	55	29.73	83	"	13,412		
" 21	Nen-Chü .. ..	18.78	55	29.73	83	"	12,811		
" 21	Nen-Da .. ..	18.67	55	29.73	83	"	13,133		
" 22	Ra-Ti or San-Pa .. ..	18.08	50	29.74	83	"	13,794		
" 23	Rung-Se-La, or San-Pa-Shan .. ..	16.91	45	29.74	83	"	15,769		
" 23	Half-way down .. ..	17.43	50	29.74	83	"	15,087		
" 23	Bottom of Mount .. ..	18.74	45.5	29.74	83	"	12,886		
" 23	Ta-Shiu, or Ta-So .. ..	18.43	45.5	29.74	82	"	13,947		
" 24	2½ m. beyond Ta-So .. ..	17.42	44	29.74	82	"	14,902		
" 24	At Pond, 400 feet below summit .. ..	16.63	40	29.74	82	"	16,129		
" 24	Ta-So-Shan, or J'rah-Ka-La .. ..	16.37	40	29.74	82	"	16,568		
" 24	¼ m. beyond summit .. ..	16.33	42	29.74	82	"	16,336		
" 24	2½ m. beyond summit .. ..	17.02	44	29.74	82	"	15,555		
" 21	Pun-Jang-Mu, or Pung-Cha-Mu .. ..	18.57	47	29.74	82	"	13,158		
" 25	Ba-Jung-Shih or Hsiao-Pa-Chung .. ..	20.40	60	29.74	82	"	10,691		
" 25	Ba'ang .. ..	"	"	"	"	"	8,546		
" 29	Ch'a-Shu-Shan, or Cha-Ku Pass .. ..	21.40	60	29.75	82	"	9,388		
" 29	Chu-Ba-Lang .. ..	22.34	65	29.75	82	"	8,165		
" 30	Gue-Ra .. ..	22.01	70	29.76	82	"	8,660		
" 30	3¼ m. beyond Gue-Ra—Upper limit of walnuts .. ..	20.84	50	29.76	82	"	9,371		
" 30	4 m. beyond Gue-Ra—Lower limit of oak .. ..	20.53	50	29.76	82	"	10,392		

30	4½ m. beyond Gue-Ra—Lower limit of pines .. ..	20-33	50	29-76	82	29°	10,670
30	Kong-Tze-La-Ka .. .. Summit	19-31	40	29-76	82	11,972	
30	Kong-Tze-Ka .. .. Village	19-51	40	29-76	82	11,675	
31	River level, 2½ m. beyond Kong-Tze-Ka .. ..	19-88	57	29-76	82	11,462	
31	Mang-M'heh, or Chung-Mong-Li .. ..	19-36	55	29-76	82	12,189	
31	Jang-Ba, or Pa-Mu-T'ang .. ..	18-85	50	29-76	82	12,793	
31	Highest Point on road, 4½ m. beyond Jang-Ba ..	17-88	55	29-76	82	14,376	
31	Kia-Ne-Tyin .. ..	18-68	55	29-76	82	13,135	
Sept. 1	Dzung-Ngyu, improperly called Dzongun .. ..	20-28	55	29-76	82	10,792	
2	12½ m. beyond Boah-Taa .. ..	20-94	55	29-76	81	9,885	
2	13½ m. beyond Boah-Taa .. ..	20-63	56	29-76	81	10,387	
2	Nieh-Ma-Sa .. ..	20-28	60	29-76	81	10,868	
3	Ma-Ra .. ..	19-77	54	29-77	81	11,505	
3	Tsa-Leh .. ..	18-883	47	29-77	81	12,690	
3	3½ m. beyond Tsa-Leh—Rhododendrons commence ..	18-09	55	29-77	81	14,109	
4	Zigzag commences, end of oaks and pines .. ..	17-68	48	29-77	81	14,651	
4	Tsa-Leh-La-Ka .. .. Summit	16-95	45	29-77	81	15,788	
4	End of Zigzag .. ..	17-50	48	29-77	81	14,935	
4	1½ m. beyond Tsa-Leh-La-Ka—Gooseberries and Currants .. ..	17-78	50	29-77	81	14,523	
4	Lung-Zung-Nang .. ..	18-92	50	29-77	81	12,684	
5	1 m. beyond Lung-Zung-Nang—Bamboos .. ..	19-32	52	29-77	81	12,207	
5	6½ m. beyond Lung-Zung-Nang—Passion Flowers ..	20-38	52	29-77	81	10,698	
5	At a bridge, 9 m. beyond Lung-Zung-Nang .. ..	21-00	55	29-77	81	9,988	
5	Dong .. ..	21-60	55	29-77	81	9,000	
5	Jo-La-Ka .. .. Summit	19-14	52	29-77	81	12,389	
5	A-Tun-Tza .. ..	20-096	52	29-77	81	11,029	
9	Pa-Ma-La .. .. Summit	17-85	48	29-79	81	14,307	
9	Mien-Chu-La .. .. Summit	17-90	48	29-79	81	14,227	
9	Shwo-La .. .. Summit	17-85	48	29-79	81	14,307	
9	Deung-Do-Lin-Sa .. ..	21-37	55	29-79	81	9,335	
11	Sha-La .. ..	21-48	62	29-80	80	9,287	
13	4½ m. beyond Sha-La—Rhododendrons .. ..	19-34	51	29-80	80	11,445	
13	At foot of Zigzag—Bamboos noticed .. ..	19-02	51	29-80	80	11,924	



TABLE II.—continued.

Date.	PLACE.	c.	f.	g.	h.	k.	l.	m.	n.
		Corrected Mean Barometer, Sea Level.	Cor- rected Mean Tempe- rature.	Cor- rected Mean Barometer, Sea Level.	Cor- rected Mean Tempe- rature, Sea Level.	Latitude.	Deducted Altitude.	Mr. Baber's Deducted Altitude.	Mr. Baber's Altitude re-calculated, using the mean of Shanghai and Canton as Datum.
							English Ft.	English Ft.	English Ft.
Sept. 13	Jing-Go-La .. .. .	18.27	50	29.80	80	28°	13,699		
" 13	2½ m. beyond Jing-Go-La—Limit of bamboo .. ..	19.49	52	29.80	80	"	11,907		
" 13	5½ m. beyond Jing-Go-La—A wood-cutter's hut ..	20.53	54	29.80	80	"	10,475		
" 13	Ka-Ri—Limit of true oak .. ..	21.19	57	29.80	80	"	9,610		
" 14	3½ m. beyond Ka-Ri—River level .. ..	22.28	63	29.80	80	"	8,226		
" 14	7½ m. beyond Ka-Ri—Passion Flowers .. ..	23.61	63	29.80	80	"	7,806		
" 14	N'doh-Sung .. .. .	22.92	63	29.80	80	"	7,417		
" 15	Near some houses, 6½ m. beyond N'doh-Sung ..	23.08	67	29.80	80	"	7,261		
" 15	Sa-Ka-Tying .. .. .	23.23	67	29.80	80	"	7,075		
" 15	Ron-Sha .. .. .	23.89	67	29.80	80	"	6,916		
" 16	3½ m. beyond Ron-Sha .. ..	23.12	60	29.81	80	"	8,436		
" 16	Village, 4½ m. beyond Ron-Sha .. ..	21.52	55	29.81	80	"	9,157		
" 16	6 m. beyond Ron-Sha—Road enters dense forest, long pendants of moss—Rhododendrons .. ..	20.58	52	29.81	80	"	10,381		
" 16	6½ m. beyond Ron-Sha—Strawberries, currants, small wild bamboo—Zigzag commences .. ..	19.65	50	29.81	80	"	11,657		
" 16	Rung-Geh-La-Ka .. .. .	19.32	50	29.81	80	27°	12,134		
" 16	Junction of rivers 100 feet above river .. ..	23.21	65	29.81	80	"	7,117		
" 16	La-Pu, or Ta-Chio .. ..	23.49	65	29.81	80	"	6,777		
" 17	Jie-Bu-Ti, or Chi-Dzang .. ..	23.61	65	29.82	80	"	6,621		
" 17	Wai-Ta-Chien, or Lu-Jiong .. ..	23.59	65	29.82	80	"	6,647		
" 18	At a bridge, 6½ m. beyond Lu-Jiong .. ..	23.85	65	29.82	79	"	6,349		
" 18	Summit of spur, 7 m. beyond Lu-Jiong .. ..	23.55	65	29.82	79	"	6,735		





TABLE II.—continued.

Date.	PLACE.	e.	f.	g.	h.	k.	l.	m.	n.
		Corrected Mean Barometer.	Cor- rected Mean Tempe- rature.	Corrected Mean Barometer, Sea Level.	Cor- rected Mean Tempe- rature, Sea Level.	Latitude.	Deducted Altitude.	Mr. Baber's Deducted Altitude.	Mr. Baber's Altitude re-calculated, using the Mean of Shanghai and Calcutta as Datum.
							English Ft.	English Ft.	English Ft.
Oct. 9	At bottom of spur, half-way between Tieh-Ch'ang and Hsiao-Hun-Ch'iao ..	24.23	60	29.97	75	25°	5986		
" 9	Summit—Hun-Ch'iao range ..	22.30	50	29.97	75	"	8229		
" 9	Sha-Yang, or Shiao-Yang ..	25.03	70	29.97	75	"	5145	5300	5248
" 10	Summit of ridge east of the Lan-Ts'ang-Chiang ..	24.75	65	29.98	75	"	5432		
" 10	Bridge across Lan-Ts'ang-Chiang, or Mekong River ..	26.10	70	29.98	75	"	3933		
" 10	Temple of Shui-Yin-Ssu, 2 miles from bridge ..	24.01	62	29.98	75	"	6270		
" 10	Shui-Chai ..	23.75	61	29.98	75	"	6569	6700	
" 10	1 m. beyond Shui-Chai ..	23.35	60	29.98	75	"	7042		
" 10	2 m. beyond Shui-Chai ..	23.09	59	29.98	75	"	7349		
" 10	Ta-Li-Shao ..	23.03	58	29.98	75	"	7412		
" 11	Tien-Ching-P'u ..	22.65	50	29.98	75	"	7795	8166	8198
" 11	Pan-Ch'iao ..	24.54	66	29.98	75	"	5692		
" 11	Yung-Ch'ang-Fu ..	24.582	66	29.98	75	"	5645	5880	5819
" 14	Summit, 8 m. beyond Yung-Ch'ang-Fu ..	22.71	50	30.00	74	"	7733		
" 14	Hun-Shui-T'ang ..	24.36	62	30.00	74	"	5874		
" 14	P'u-P'iao ..	25.42	68	30.00	74	"	4711	4550	
" 14	Fang-Ma-Chang ..	25.23	66	30.00	74	"	4910		
" 15	Lu-Chiang-Pa, village on right bank of the Lu-Chiang or Salween River ..	27.38	73	30.00	74	"	2620	2670	
" 15	Ho-Mu-Shu ..	24.73	66	30.00	74	"	5486	5560	
" 16	1 m. beyond Ho-Mu-Shu ..	23.89	64	30.01	74	"	6433		

16	Summit of spur .. .. .	23-11	60	30-01	74	7353	
16	On a ridge, at a point where a valley runs down on each side .. .. .	23-44	62	30-01	74	6972	
16	Hsiang-Po .. .. .	23-48	62	30-01	74	6924	7250
16	1 mile west of Hsiang-Po, commence ascent .. .. .	23-26	61	30-01	74	7181	
16	Half-way between Hsiang-Po and highest point of pass .. .. .	23-30	61	30-01	74	7132	
16	Highest point of pass, Kao-Li-Kung Range .. .. .	22-45	56	30-01	74	8129	8702
16	End of short descent .. .. .	22-76	56	30-01	74	7742	
16	1 mile west of last point .. .. .	22-67	56	30-01	74	7853	
16	Commencement of descent .. .. .	22-63	56	30-01	74	7904	
16	Tai-Ping-P'u .. .. .	22-96	60	30-01	74	7538	7780
16	Lung-Chiang or Shuay-Li River. Bridge across .. .. .	25-60	66	30-01	74	4502	4224
17	Kan-Lan-Chan .. .. .	25-13	66	30-01	74	5023	
17	Half-way between Kan-Lan-Chan and Kan-Lu-Sau .. .. .	23-66	62	30-01	74	6708	
17	1 mile east of Kan-Lu-Sau .. .. .	23-84	63	30-01	74	6501	
17	Half-way between Kan-Lu-Sau and Ch'in-Ts'ai-P'u .. .. .	23-26	61	30-01	74	7181	
17	Ch'in-Ts'ai-P'u, or Ch'in-Ts'ai-P'u .. .. .	23-35	62	30-01	74	7082	
17	Urh-Tai-P'o .. .. .	22-99	60	30-01	74	7500	
18	T'eng-Yüeh-Ting, or Momein .. .. .	24-714	63	30-01	74	5489	5493
20	7 miles from T'eng-Yüeh-Ting .. .. .	24-52	63	30-03	73	5742	
20	Hsiao-Ho-Ti .. .. .	25-92	65	30-03	73	4178	
20	On the Road, 4 miles East of Nan-Tien .. .. .	26-19	65	30-03	73	3864	
20	Che-Tao-Ch'eng .. .. .	26-41	65	30-03	73	3625	
21	Mungla, or Kan-Ngai .. .. .	27-05	65	30-04	72	2957	
22	Chan-Ta, or Sanda .. .. .	27-07	65	30-05	72	2945	
23	Man-Yün, or Manwyne .. .. .	27-40	71	30-07	72	2647	
29	Pong-Si .. .. .	26-49	65	30-08	71	3584	
30	On the Taping Chung, or River of T'eng-Yüeh, at confluence of Nampoung River .. .. .	28-83	65	30-08	70	1198	
31	Ma-Mon or Sicaw .. .. .	29-60	75	30-09	70	462-5	
31	Bhamo .. .. .	..	..	..	..	430	



TABLE III.

NAME OF PLACE.	Dates and Interval.	Mean Corrected Barometer.	Mean Thermometer.	Approximate Latitude.	Mean Barometer Shanghai, in same interval.	Mean Thermometer Shanghai, in same interval.	Altitude deduced from Shanghai as Datum.	Mean Barometer Calcutta, in same interval.	Mean Thermometer Calcutta, in same interval.	Altitude deduced from Calcutta as Datum.	Mean of Results.
Ch'eng-Tu ..	May 10 to 18	28.227	67.43	N. 31°	29.92	69.	1647.	29.67	86.	1386.	Eag. Ft. 1504.
Ditto ..	June 21 to July 9	28.078	77.7	..	29.63	80.5	1554.	29.51	84.	1429.	8346.
Tu-Chien-Lu ..	July 25 to Aug. 7	22.092	59.	30°	29.775	87.	8446.	29.571	83.	8247.	8546.4
Bai'ang ..	Nov. 1876	21.964	40.	30°	30.36	56.	8754.	29.97	74.8	8519.	
Ditto ..	Dec. 1876	22.174	29.	..	30.47	46.	8897.	30.04	68.0	8150.	
Ditto ..	Jan. 1877	22.024	31.	..	30.40	41.	8508.	30.00	67.7	8323.	
Ditto ..	Feb. 1877	21.854	38.	..	30.32	42.	8785.	29.94	73.0	8597.	
Ditto ..	June 1877	21.904	66.	..	29.72	76.	8628.	28.55	85.0	8514.	
Ditto ..	July 1877	21.884	69.	..	29.71	85.	8827.	29.54	83.5	8605.	
Bhamo ..	Oct. 2 to Oct 6	29.47	73.5	24°	30.085	70.5	581.9	29.78	82.	277.7	429.8

TABLE IV.

NAME OF PLACE.	Date of Captain Gill's Visit.	Corrected Barometer at Place at Time of Captain Gill's Visit.	Corrected Thermometer at Place at Time of Captain Gill's Visit.	Barometer at Shanghai at Time of Captain Gill's Visit.	Thermometer at Shanghai at Time of Captain Gill's Visit.	Altitudes obtained from Captain Gill's Observations, using Shanghai as Datum.	Barometer at Calcutta at Time of Captain Gill's Visit.	Thermometer at Calcutta at Time of Captain Gill's Visit.	Altitudes obtained from Captain Gill's Observations, using Calcutta as Datum.
Ta-Li-Fu .. .. .	Sept. 27 to Oct. 3	23.538	57	30.66	71°	English Feet. 6783	29.77	82	English Feet. 6083
Ho-Chiang-P'u .. .. .	Oct. 5	24.89	59	30.10	70°	6319	29.79	82	6046
Shun-Pi-Ho .. .. .	7	24.86	60	30.11	70°	6371	29.80	82	6108
T'ien-Ching-P'u .. .. .	8	23.46	65	30.12	69°	8254	29.80	81	8018
Ch'u-Tung .. .. .	9	24.63	65	30.12	69°	6682	29.80	81	6412
Shia Yang .. .. .	9	25.02	70	30.12	69°	5282	29.81	81	5009
T'ien-Ching-P'u .. .. .	11	22.65	60	30.14	68°	7900	29.82	81	7671
Yung-Chang-P'u .. .. .	11	24.582	66	30.15	67.5	5771	29.83	81	5506
Summit, Kao-Li-Kung Range .. .. .	16	22.45	66	30.17	67°	8239	29.84	81	8009
Lung-Chiang, or Shun-Yi River .. .. .	16	23.60	62	30.17	67°	4609	29.84	81	4322
T'eng-Yueh-Fing .. .. .	18	24.714	63	30.18	66°	6616	29.85	81	6346

NAME OF PLACE.	Date of Mr. Baber's Visit.	Corrected Barometer at Place at Time of Mr. Baber's Visit.	Corrected Thermometer at Place at Time of Mr. Baber's Visit.	Altitudes obtained by Mr. Baber himself.	Barometer at Shanghai at Time of Mr. Baber's Visit.	Thermometer at Shanghai at Time of Mr. Baber's Visit.	Altitudes obtained from Mr. Baber's Observations, using Shanghai as Datum.	Barometer at Calcutta at Time of Mr. Baber's Visit.	Thermometer at Calcutta at Time of Mr. Baber's Visit.	Altitudes obtained from Mr. Baber's Observations, using Calcutta as Datum.
Ta-Li-Fu .. .. .	April 11 to April 15	23.29	69	7090	30.02	58.5	Eng. Feet. 7142	29.76	84.5	Eng. Feet. 7050
Ho-Chiang-P'u .. .. .	April 16	24.87	57	5150	30.02	58.5	6257	29.76	84.5	6046
Shun-Pi-Ho .. .. .	19	24.89	74	5280	30.02	58.5	5289	29.76	84.5	6102
T'ien-Ching-P'u .. .. .	20	22.10	59	8410	30.02	61.5	8536	29.726	85°	8304
Ch'u-Tung .. .. .	21	24.64	69	6620	30.02	61.5	6547	29.726	85°	8307
Shia Yang .. .. .	22	24.87	73	5360	30.02	61.5	5296	29.726	85°	8131
T'ien-Ching-P'u .. .. .	25	22.32	61	8166	30.02	63.5	8289	29.713	85.5	8123
Yung-Chang-P'u .. .. .	26	24.35	71	5890	30.00	63.5	5886	29.713	85.5	8719
Summit, Kao-Li-Kung Range .. .. .	May 1	22.05	75	8720	29.985	64.5	8712	29.985	86°	8629
Lung-Chiang, or Shun-Yi River .. .. .	2	25.68	62	4303	29.985	64.5	4314	29.985	86°	4105
T'eng-Yueh-Chou .. .. .	3	24.56	61	5540	29.985	64.5	6583	29.985	86°	5370



## ITINERARY.

18th May, 1877.—*Ch'êng-Tu to Pi-Hsien*.—Ch'êng-Tu, cap. of Ssu-Ch'uan, altitude 1504 feet. Great many open spaces and gardens near west gate. At 3·8 m., cross stream, 3 yards wide, flowing N.E. Village. Soil, a grey, clayey sandstone. 5·8 m., cross small stream, flowing S.W. 6·4 m., village. 9·1 m., cross stream, 3 yards wide, flowing N.E.; bridge, with pilo\* at each end. 9·6 m., hamlet, with pilo. Stream on left of road, 3 yards wide, flowing S.W. Road on right of stream, flowing S.E., to 10·6 m., suburb of Pi-Hsien. 11·2 m., Pi-Hsien city; altitude 1766 feet.

19th.—*Pi-Hsien to Kuan-Hsien*.—Stone bridge at N.W. gate of Pi-Hsien, over river 10 yards wide, flowing N.E. from N.W., on left of road, to 4 m., village. 4·6 m., town, not walled. 6·1 m., town of Ngan-Tê-P'u; altitude 1776 feet. 8·1 m., cross stream, flowing N.E. 8·2 m., village. 8·3 m., cross stream flowing N.E. 10·2 m., town, with many pilos. Crops nearly all wheat and hemp, some rice, and a very little oats; also the red flower Cheauze or Cho-Ma. 12·3 m., river on right of road flowing N.E., from N.W. to 13·4 m., where road crosses river 60 yards wide by wooden bridge of 9 spans on trestles, framework of roof. 13·9 m., town. 14·1 m., river on right of road flowing N.E. from N.W., to 14·8 m., where road crosses it by stone bridge; tea-house built over stream. 17·6 m., stone bridge of 2 arches over stream 10 yards wide, flowing N.E. 18·1 m., great gate outside suburb of Kuan-Hsien. 18·4 m., cross river flowing N.E. 18·6 m., gate in S.E. wall of Kuan-Hsien. Crops, hemp and wheat, not much rice, and very little oats; rape harvest; planting rice. Road from Ch'êng-Tu to Kuan-Hsien, over a perfectly flat plain the whole way, with rapid watercourses on both sides. Scarcely any paving on road, which is 15 feet wide.

21st.—*Kuan-Hsien to Yin-Hsiu-Wan*, ascending Hsi-Ho on left (E.) bank.—At Kuan-Hsien, alt. 2347 feet, valley of river 1060 yards broad; suspension-bridge across part of channel, only in the dry weather. 3 m., village; road to N.E. 3·4 m., cross stream from N.E. Red sandstone hills on opposite side of river rising 1200 feet above the valley. 4 m., large village. 4·3 m., cross river from N.E. by a ferry. Sandstone mountains to N.E. 5·6 m., stream enters river from W. 6·5 m., seams of coal. 7·3 m., cross stream from N.N.E. by covered bridge. 8·1 m., stream from N. enters river; ascend stream on left (E.) bank to 9·2 m., and cross by roofed bridge. Limestone, strata vertical, striking S. and S. 9·5 m., town of Yu-Ch'i; altitude 2670 feet. Ascend right (W.) bank of stream to summit of pass. 11·5 m., summit, altitude 4808 feet; temple and tea-house. Descend stream, flowing W.N.W., on right (N.E.) bank, to near its mouth, 13·9 m., where the Hsi-Ho and a large tributary entering from the W. are each crossed by a suspension-bridge. 15·3 m., town of Yin-Hsiu-Wan, at mouth of stream from E., crossed by covered bridge; altitude 3187 feet.

22nd.—*Yin-Hsiu-Wan to Tao-Kuan*, ascending Hsi-Ho on left (E.) bank.—3 m., cross stream from E. 1·5 m., village. Hills on both sides of river rise from 3000 to 4000 feet above valley. 2·3 m., stream enters river from W. 3·3 m., villages on both banks of river. 3·9 m., stream enters river from W.; hill between road and river. 4·1 m., cross stream from S.E. by covered wooden bridge. Villages on both sides of stream. 5·1 m., cross stream from E. 6·3 m., pilo. 7 m., town of Hsin-Wên-P'ing; altitude 3241 feet. 7·5 m., stream enters river from W. 8·2 m., cross stream from E. 9 m., stream enters river from W. 9·7 m., cross stream from S.E. 10·4 m., village; cross stream from S.E. 10·6 m., village. 11·7 m., altitude of river 3382 feet. 12·3 m., cross stream from S.E. 13·5 m., stream enters river

\* A "Pilo" is a triumphal arch.

from w.; valley very narrow; hills very steep; no cultivation. 14.5 m., cross stream from s.e. 14.9 m., altitude of river 3619 feet. Bears and boars in the mountains. 15.4 m., town of T'ao-Kuan, altitude 3623 feet. From Yin-Hsiu-Wan to T'ao-Kuan, rocks, all limestone. A green stone very frequent on road, high above river; could not see this stone on the rocks. At one place, low down near the river, there was a deposit of rounded, water-worn pebbles and boulders, in clay and sand, but well above the river-bank. The river was possibly at a higher level in former days.

23rd.—*T'ao-Kuan to Pan-Ch'iao*, ascending Hsi-Ho, on left (E.) bank.—.3 m., cross junction of two streams from s.e. and e.s.e. 1.5 m., a wild gorge, with steep and precipitous slopes on both sides. Road cut out of sides of hills and precipices, and often propped up from below. Suspension-bridge 60 yards span, 5 ropes on each side, vertical battens, 1 yard apart, drop about 10 feet. 1.7 m., very narrow valley; hills very precipitous, running up 3000 feet above river. 2.8 m., village; stream enters river from s.w. Suspension-bridge, 60 yards span, 5 ropes on each side. 4.3 m., stream enters river from s.w. 5.3 m., cross stream from s.e. Cultivated ground in bends of river, where there are a few acres of flat land. 6.3 m., on right bank of river, a former Mantzu village; the first seen. 6.7 m., pagoda; stream enters river from n.w. 7.4 m., cross stream from s.e. 7.9 m., cross stream from s.e.; village  $\frac{1}{2}$  mile on right of road. 9.4 m., pilo. Hill-sides not so steep, and are cultivated. 9.6 m., town of Wên-Ch'uan-Hsien,  $\frac{1}{2}$  mile from left (E.) bank of river; altitude 3899 feet, on a little plateau about 100 feet above river. Stream enters river from n.w. North-east of the pagoda to Wên-Ch'uan-Hsien the valley opens out and the hills are less steep; there is cultivation below and on the hill-sides. In all the bends of the river there is a little flat ground cultivated. The road from Yin-Hsiu-Wan to Wên-Ch'uan-Hsien is very bad indeed. 10.7 m., stream enters river from n.w. Valley again closes in a gorge with precipitous sides. 11.2 m., cross stream from s.e. 11.9 m., cross stream from E. Hills on both sides rise 3000 feet above river. 12.6 m., stream enters river from n.w. 14.1 m., road rises high above river, and descends by a zigzag to Pan-Ch'iao. 14.3 m., Mantzu village  $\frac{1}{2}$  mile from right bank of river; other Mantzu villages on tops of mountains with cultivation round them. 14.4 m., stream enters river from n.w. 15 m., cross stream from s.e.; town of Pan-Ch'iao, altitude 4275 feet. From Wên-Ch'uan-Hsien to Pan-Ch'iao river runs between steep hills, closing in the valley. Road fair.

24th.—*Pan-Ch'iao to Hsin-P'u-Kuan*, ascending Hsi-Ho, on left (s.e.) bank.—6 m., limestone rocks inclined 60° or 80°, strike s.e., s.w. 1.2 m., village. Valley opens out a little on the E., to 2.4 m., where river widens considerably and encloses a small island. Precipices on western side of river. 2.6 m., village. The road from this place is carried over hills for about  $\frac{1}{2}$  mile. 3.2 m., cross stream from s.e., about  $\frac{1}{2}$  mile from its mouth, where stream enters river from n.w. North of this point very steep hills close in the valley on both sides. 5.2 m., stream enters river from n.w. 6.2 m., town of Hsin-P'u-Kuan, at confluence of the Fu-Ho from n.w.; altitude 4398 feet. This town is also called Ku-Wei-Chou, and Pu-Hsien. Limit of bamboo. Stream enters river from s.e.

24th to 26th.—*Hsin-P'u-Kuan to Li-Fan-Fu*, ascending right (s.) bank of the Fu-Ho, which runs in a narrow valley, between bare and steep limestone masses, scarcely broken by a gully; the road up the valley is easy all the way. At Hsin-P'u-Kuan crossed the Hsi-Ho, and Fu-Ho to right bank, by suspension-bridges.—1 m., a narrow gorge with precipitous sides. 2.6 m., village on left bank of river where stream enters from s.e. 5 m., bare mountains on both sides, very precipitous, 2000 feet above the river. 5.3 m., cross stream from s.w. 6.1 m., village. 6.5 m., bridge over river. 6.6 m.,



village on north bank of river; stream enters river from N.N.E. 7.5 m., stream enters river from N.N.E. 8 m., town of Ku-Ch'eng, altitude, 4888 feet. From Hsin-P'u-Kuan to Ku-Ch'eng the rocks are of limestone inclined  $60^{\circ}$  to  $80^{\circ}$ . 8.1 m., cross stream from s. 9.6 m., cross stream from s.; village. 10.6 m., stream enters river from N. 12.3 m., bridge over river. 12.7 m., cross stream from S.S.E.; village. 12.8 m., Mantzu village on top of mountain,  $\frac{1}{4}$  m. north of river. The mountain sides are bare and rugged, very little broken by streams or valleys. 13.5 m., village. 14 m., village on left bank of river, nearly deserted. Stream enters from N. 14.4 m., village of Kan-Ch'i; altitude 4821 feet. 14.7 m., cross stream from W.S.W. Looking up the gorge of this stream wooded slopes are seen back amongst the hills. 16.8 m., stream enters river from N.W. 18.7 m., mountain on left bank, rising 3000 feet above the river, with immense precipices at the top. 19.3 m., city of Li-Fan-Fu, with pagoda; altitude, at inn, 5312 feet, river-level 5200 feet. Stream traverses town in N.W. direction; and stream enters river from N.W. "Snow Dragon" Mountain 3 miles S.S.E. Vast snow-fields reported to be in the neighbourhood of Li-Fan-Fu; and glaciers at no great distance. From Ku-Ch'eng to Li-Fan-Fu, the limestone beds are nearly vertical, generally striking E. and W., with veins of quartz. The river is about 30 yards broad in a valley that is from 50 to 300 yards wide. Mountains on both sides, almost precipitous, higher ones behind. The affluent streams all run through deep gorges, with precipices on both sides. The valley of the main stream is cultivated in terraces as long as the sides are not too steep. The crops are chiefly barley. There are a few walnut and other trees near the valley.

27th.—Hsin-P'u-Kuan to Wên-Ch'eng, ascending left (S.E.) bank of the Hsi-Ho.—1.4 m., village;  $2\frac{1}{2}$  miles to S.E. is the Niu-T'ou-Shan (Snow Mountain). 1.6 m., cross stream from S.E. 3.2 m., rocks all limestone, in places the strata much twisted. 4.5 m., cross stream from S.E. 4.8 m., village. 5.2 m., tower. 5.6 m., stream enters river from N.W.; a village on each side of its mouth. Here trees and terrace cultivation begin on right bank, and continue with many trees for 2 miles N.E. of this point. There is a narrow strip of not very steep ground on the bank of the river. 6.3 m., ruins. 6.6 m., gate across road. Stream enters river from N.W.; village at its mouth. 7.2 m., cross stream from E. 7.4 m., town of Wên-Ch'eng, altitude 4670 feet. From Hsin-P'u-Kuan to Wên-Ch'eng, the hills are not so precipitous, there is little foliage or green, only a few shrubs. To the east the snowy mountain tops are visible up the valleys.

28th.—Wên-Ch'eng to Mao-Chou, ascending left (S.E.) bank of the Hsi-Ho.—1.3 m., village. 1.6 m., here the valley opens out on the left bank; precipices on the right. Peaks on both sides rising 2000 to 3000 feet above the river. 1.9 m., cross stream from S.E. 2.6 m., village. 3.1 m., stream enters river from W.; village on small plateau close to right bank of river, with many trees. 4.2 m., village; cross stream from S.S.E. Snow Mountain, called "Sacred Temple," seen, bearing E. 5.2 m., gate and fort; road goes through both. Hill-sides very precipitous. Near this is a thin layer of red and green stone, in which are veins of quartz nearly vertical striking N.E. 5.9 m., cross stream from S.E. 6 m., village of Pai-Shui-Chai; altitude, at inn, 4717 feet, river level 4694 feet. 6.2 m., stream enters river from N.W. 7.4 m., mountain on right bank of river 2500 feet high. 8 m., stream enters river from N. near village on right bank. River here widens out into a shallow lake through which the road passes at 8.3 m. 8.6 m., village on N.E. bank of lake. "Nine Nails" mountain (snowy) 6 miles to S.E. 9.1 m., stream enters river from W.; village near its mouth. 10.2 m., cross stream from E.S.E. 11.3 m., cross stream from E. 12.4 m., cross stream from S.E.; village. 12.6 m., stream enters river from N.W.; village near its mouth. Mountain 2000 feet high,  $1\frac{1}{2}$  mile to W. 13.2 m., river runs through a narrow gorge with steep

or precipitous banks. Peaks on both sides rising to 2000 feet above the river. On the east snowy peaks are seen up the valleys, the tops rising 1500 or 2000 feet above the snow-line. 15.6 m., gate outside Mao-Chou; pagoda on right of road. 16.1 m., city of Mao-Chou; altitude 4996 feet. As Mao-Chou is approached from the south, the river valley opens out to a width of two miles, enclosed on all sides by high hills and mountains. The soil does not look very fertile. From Wên-Chêng to Mao-Chou the crops are mostly Indian corn and barley. In some places south-west of Mao-Chou the river has cut its way to a depth of sometimes as much as 100 feet through a horizontal deposit of clay debris and sharp stone. This deposit forms small flat and perfectly level plains at the foot of the mountains. The river here runs through narrow gorges; these were probably once blocked, and the valleys small lakes, but the sharp stones are difficult to account for.

30th.—*Mao-Chou to Ch'a-Erh-Ngai*, ascending left (E.) bank of the Hsi-Ho.—At Mao-Chou the river is half a mile distant from the town.—1.5 m., cross stream from E. by covered bridge at village. 2 m., stream enters river from S.W. The valley here closes in. The river runs through a narrow gorge, the mountains on both sides running straight down to the water, and often ending in sheer precipices. The sides are nearly bare, and rugged, with great cliffs high up the mountain side. The peaks rise to 2000 feet. Here and there at points of the river, and up valleys, there is an acre or two of level ground cultivated. The close gorge and bare mountains continue all the way to Wei-Mên-Kuan. Looking up the valley of stream to S.W., the tops of the higher mountains are wooded. 4.3 m., cross large stream from S.E. by covered bridge. 4.5 m., village of Wei-Mên-Kuan; altitude 5123 feet. Stream enters river from W.S.W. 5.6 m., stream enters river from S.S.W. 7 m., cross stream from N.E. 8.3 m., cross stream from N.E. 8.4 m., stream enters river from S. 9.3 m., stream enters river from S.W. 11 m., cross stream from S.N.E.; village of Ch'a-Erh-Ngai; altitude 5423 feet; river level 5091 feet. From Mao-Chou to Ch'a-Erh-Ngai, limestone and slaty shales. There are scarcely any crops but a very little barley, a few poplars, and a kind of acacia, from which soap is made. The barberry has disappeared. There are a few very poor bamboo at a village to the S.E. of Ch'a-Erh-Ngai.

31st.—*Ch'a-Erh-Ngai to Ta-Ting*, ascending left (E.) bank of the Hsi-Ho, which is known as the Sung-Fan-Ho above the junction of the Lu-Hua-Ho.—7 m., stream enters river from S. 2.2 m., cross stream from E., which runs through a very precipitous gorge. Village. One mile from right bank, a Mantzu village on summit of mountain 3000 feet above river, wooded at the top. 3.4 m., cross stream from N.E.; village of Ch'ang-Ning-P'u. From Ch'a-Erh-Ngai to Ch'ang-Ning-P'u, both sides extremely steep and precipitous; very rugged mountain masses torn into all sorts of shapes. The tops of the higher mountains to the S. are wooded; otherwise they are very bare. The road is sometimes 400 feet above, sometimes at the level of the stream. There are many precipices both high up and low down. 5 m., the Lu-Hua-Ho enters from S.W., as large as the Sung-Fan-Ho. The white Mantzu live six days up the Lu-Hua-Ho; the black Mantzu are many days further. 6.2 m., village of Mu-Su-P'u; altitude, at inn, 5344 feet, river-level 5137 feet. 6.3 m., cross stream from E. 10 m., cross stream from N.E. Bridge over river. Stream enters from S.W.; this valley is more open, and the sides of the hills well wooded. 11.1 m., stream enters river from S.W. 11.8 m., cross stream from N.E. Town of Ta-Ting; altitude, at inn, 5798 feet, river-level 5739 feet. Snow Mountain, 3 miles E.S.E.

1st June.—*Ta-Ting to Sha-Wan*, along E. side of the Sung-Fan-Ho. From Ta-Ting, the road to the north leaves the river valley, and begins ascending at once.—6 m., stream enters river from W.S.W., running through a wooded valley. The river bounded on both sides by precipices. 1.6 m., wide, open valley on



right of road, with gentle slopes, much cultivated and well wooded. 2.5 m., village on right of road, 1000 feet above the river; altitude 6988 feet; there is here a good deal of level ground. Stream enters river from w. Here begins, on right of river, a snowy ridge of mountains, running n., with a general elevation of 2000 feet above the river. The tops of the hills below the snow-line are well wooded with fir. 3 m., village of Shui-Kou-Tzu; altitude 6940 feet. Behind Shui-Kou-Tzu, the mountain to the e. rises not very precipitously until just the top, when it ends in high crags. 3.6 m., steep slopes to the river below little plateau, and above the road tremendous precipices. On right bank, a great bare mountain, running steep down to the river. Great precipices. 4.9 m., slopes here well wooded, ferns, barberry, small oaks, scrub, thorns, and wild flowers. 5.5 m., altitude 7975 feet. 5.7 m., the road passes above a little plateau; above the road, a gentle slope. Stream enters river from w.; the black Mantzu live up this valley. 7.2 m., stream enters river from e.n.e. 8.2 m., town of Tieh-Chi-Ying; altitude 7837 feet, on a flat plateau, behind which are tremendous and inaccessible crags. There are tremendous precipices below the plateau. 8.8 m., stream enters river from w.; its valley is well wooded. 9 m., a very important affluent enters river from n.w., flowing through a well-wooded valley. 10 m., cross stream from s.e. From here the road descends to the river by a very steep and difficult path cut in the sides of the rocks; in places it zigzags down. 11 m., town of Sha-Wan; altitude 7017 feet; spur from big mountain on right of river. North of Sha-Wan the valley is more open. Precipitous crags on the left bank of river; on the right bank the hills are low, and gently sloping. Northern slopes of hills on both sides of river, well wooded with pines.

2nd.—*Sha-Wan to Chêng-P'ing-Kuan*, ascending left (e.) bank of Sung-Fan-Ho.—1.1 m., cross stream from e.s.e. 2.1 m., hills on left bank of river about 2000 feet high; on right bank, about 1000 feet. 3.5 m., stream enters river from w.s.w., running through an open and wooded valley. Bridge over river. 4 m., wooded slopes on both sides of river. 4.7 m., stream enters river from w.; cross stream from e. 5.8 m., low hills on right bank, gently sloping. 6.2 m., Sung-Pan-Ting district commences here. 6.4 m., stream enters river from w.; open valley. 6.9 m., cross stream from e.s.e. 7.1 m., town of P'ing-Ting-Kuan; altitude 7436 feet. 7.9 m., cross stream from s.e.; stream enters river from n.w. 9.3 m., cross stream from s.e. 9.9 m., stream enters river from w. Hills on right bank about 1000 feet high. 10.3 m., stream enters river from w.s.w. 11 m., village of Chên-Fan-Pao. Cross stream from s.e. Wooded ridge 2 miles to w., about 2000 feet high. Road from Sha-Wan to Chên-Fan-Pao close to the river all the way, and very good. In some places, close to the river's edge, are perfectly horizontal beds of a soft clay, which, between the fingers, turns to impalpable powder, without grit; above this there are horizontal beds of clay and sand, in which are sharp stones. Above this again are the limestone rocks, dip 45°, strike n.w. and s.e. 11.6 m., cross stream from n.e. Mantzu village on right of road. Snowy ridge 1½ m. to e. 12.3 m., cultivated hill-sides on right bank of river; pine-forests at top; gentle slopes covered with grass and shrubs. 12.6 m., village of Chêng-P'ing-Kuan; altitude 7807 feet.

3rd.—*Chêng-P'ing-Kuan to Lung-Tan-P'u*, ascending left (e.) bank of the Sung-Fan-Ho.—1.2 m., cross stream from n.e. Wooded slopes, cultivated at the top, on both sides of river. 1.9 m., stream enters river from s.w. 2 miles to w., pine-forest on mountain 800 feet high. 2.3 m., cross stream from n.e. 3.5 m., stream enters river from s.w. Gentle slopes on both sides 800 feet above river, uncultivated. 4.2 m., village; bridge over river. 4.5 m., stream enters river from s.w. Cross stream from n.e. A valley, wooded with pines, runs up to the e., through which the mountain Shih-Pan-Fang (10 Plank House), is seen, with its summit about 2000 feet above the snow-line.

It forms a Snow Pyramid, 18,000 feet high. 5.2 m., cross stream from N.E.; hills on each side of river about 1500 feet high. 6.1 m., stream enters river from S.W.; extensive snow-fields up the valley. 6.8 m., Pin-Fan-Ying, a new village at the foot of very steep slopes, newly fortified, with 250 soldiers. 7.8 m., an affluent enters from S.W., nearly as large as the main river. 8 m., town of Chên-Chiang-Kuan, on a rocky and precipitous crag 500 feet high; altitude 8159 feet. 8.4 m., cross stream from E. 8.9 m., cross stream from E.; valley leading up to snow-fields. Hills on right of river about 1000 feet high. 10.1 m., on right bank of river, wooded slopes below, and wooded crags above. 10.5 m., a rocky and precipitous crag rises nearly straight up from the river 1000 feet, on right bank. 10.8 m., cross stream from E.N.E. 11.7 m., wooded slopes on right of road. 12 m., cross large stream from E.N.E.; bridge over river. 13.1 m., thickly wooded and steep precipitous slopes, on right bank of river. 14.9 m., cross stream from E.; stream enters river from S.W. 15.8 m., cross stream from N.E.; village; open bridge over river, and covered bridge over stream. There are small islands in the river. 16.4 m., stream enters river from W.; hills to W. not very steep and cultivated at the top. 17.6 m., stream enters river from S.W.; valley runs up to a great pine-forest. 18 m., hills on both sides of river not very steep. 18.2 m., town of Lung-Tan-P'u, altitude 8729 feet. High precipices. On right bank of river, hills about 1500 feet high. From Ch'eng-P'ing-Kuan up to this point the road follows close to the edge of the river, and scarcely ever rises above it.

4th.—*Lung-Tan-P'u to Sung-P'an-T'ing*, ascending left (E.) bank of the Sung-Fan-Ho.—2 m., stream enters river from S.W., through a cultivated valley, with well-wooded slopes; pine-forests to the W. Bridge over river. 4 m., slopes on both sides of river, covered with brushwood. 1.9 m., precipices commence on both sides of river. 2.3 m., stream enters river from S.W.; valley, with sloping wooded sides runs up to W.; bridge over river. 2.7 m., village. Easy-sloping wooded hills on W.; pines at tops. 3 m., cross stream from E.N.E.; stream enters river from W.S.W. Sloping wooded hills on W. of river. Pine-forests on tops of mountains E. and W. of river. 3.8 m., wooded hills slope down to the river on both sides. 4.5 m., precipices, and brushwood slopes on E. 5.2 m., stream enters river from S.W.; a valley with precipitous sides runs up to the W. 5.5 m., stream enters river from S.W. 5.7 m., bridge over river; village. 5.8 m., cross stream from N.E. A valley, with easy slopes runs up E., to a peak 2000 feet high. 6.4 m., stream enters river from S.W. A valley, with sloping sides, runs up to the W. to a pine-covered ridge 2000 feet high. Village on right bank of river. 7.9 m., spurs run down to left bank of river. 8.1 m., town of Ngan-Hua-Kuan; altitude 9032 feet; inn almost at river-level. Bridge over river. Mountains to E. 2000 feet high. 8.2 m., stream enters river from W. 9.4 m., cross stream from E. 10.4 m., village; cross stream from E.N.E. 12.1 m., cross stream from N.E. 12.8 m., village and bridge; stream enters river from S.W. Ascending the river, the slopes on either side become more easy; the country indicates the proximity of a plateau. The hills are more rounded, valleys more open, slopes easy, and peaks high. 13.4 m., cross stream from N.E. 13.9 m., stream enters river from S.W. 14.1 m., the river-bed opens out into several little channels, valley  $\frac{1}{2}$  mile wide. 14.6 m., village; stream enters river from S.W.; village on N. bank of stream, nearly  $\frac{1}{2}$  mile from river. 15.1 m., stream enters river from S.W.; village. 16.3 m., cross stream from N.E.; village between road and river. 16.5 m., the valley of river is here about  $\frac{1}{2}$  mile wide, and flat. Gently rounded hills on both sides of river, all cultivated in terraces. 17 m., stream enters river from W. 17.2 m., stream enters river from W.S.W. 17.7 m., town of Sung-P'an-T'ing, altitude 9470 feet. Here the hills are of a soft, smooth, clay deposit.



6th.—*Sung-P'an-Ting to Fêng-Tung-Kuan*.—From Sung-P'an-Ting, the s.w. valley up to Fêng-Tung-Kuan is very narrow. The hills on both sides are covered with grass and brushwood. Their tops are rounded, and there are no trees. The n.w. side of the valley is a ridge running n.e. and s.w. On the s.e. of the valley is also a ridge running n.e. and s.w. The small valleys running up into these ridges are all uncultivated. From Sung P'an Ting, the road zigzags up a little gorge. 2.5 m., altitude 10,636 feet. 3.9 m., Lamassery. 4.3 m., hills gently rounded on both sides of the river; all cultivated in terraces. Valley of river  $\frac{1}{2}$  mile wide. 5.9 m., road reaches river, and continues along its right (s.) bank, to its source. Grassy slopes and brushwood to s.; little cultivation. 6.5 m., village, altitude 10,484 feet. Stream enters river from s.e. 8.8 m., Hsüeh-Lan-Kuan, altitude 10,881 feet. 9.7 m., stream, 2 to 3 feet wide, enters river from s.w. 10 m., undulating hills on both sides leading up to ridges behind. Grassy slopes and brushwood, no trees, no cultivation. 10.8 m., stream enters river from s.w. 11.1 m., Fêng-Tung-Kuan, altitude 11,884 feet. Rocky and craggy ridge to n.

7th.—*Fêng-Tung-Kuan to Chêng-Yuan*.—4 m., stream enters river from s. 9 m., cross stream from n.e. 1.7 m., hut, at source of river. 1.7 to 3 m., Hsüeh-Shan Pass (Snow Mt.); altitude 13,184 feet. Here the hills are very precipitous and rugged. A little snow was lying 50 feet below the summit. The road from Fêng-Tung-Kuan to the summit of Hsüeh-Shan runs up a bare valley where there is no wood, or cultivation; only brushwood and grass. East of the summit of Hsüeh-Shan, rounded spurs run down to the valley from a rocky, craggy, and very rugged snowy ridge on the s.; these spurs are covered with grass and brushwood. 3 m., source of the Hsiao-Ho; road descends on left (n.) bank. 3.3 m., grass and brushwood on both sides of the river. 4.7 m., house. 5.6 m., cross stream from n.; a deep and precipitous gorge runs up to the n. 5.9 m., the hills on the n. are not so precipitous; the slopes are covered with grass. 6.9 m., cross stream from n.; house, with small patch of cultivation. Wooded valley (pine) to n.; extensive pine-forests to s., covering the spurs right down to the river. 7.2 m., house. 7.8 m., bridge over river. 8.9 m., Hung-Ngai-Kuan or Sung-Ngai-P'u (3 houses), altitude 10,529 feet. Cross stream from n. 9.9 m., cross stream from n. by bridge; stream enters river from s. 10.6 m., cross river by bridge; stream enters river from s. 11.5 m., re-cross river by bridge; stream enters river from s. The valley and hill-sides thickly wooded with pines; very little cultivation; precipices at tops of mountains. 12.2 m., village (8 houses); cross river by bridge. 12.3 m., cross stream from s. 12.5 m., cross stream from s. A precipitous point on the n. bank of river. 12.8 m., on the e. is a great mountain that blocks the way for the river, that here turns n.; it throws out a spur with a huge wall of rock. A wall of rock bounds the river on both sides. Wooded slopes begin here. 14 m., stream enters river from w. 15.1 m., village, very new and unfinished. Cross river to left bank. Two streams enter river from n. and n.w. 15.7 m., stream enters river from n.e. 16.3 m., house; stream enters river from n.e. 16.9 m., cross river by bridge; village. Cliffs 80 feet high. 17 m., cross stream from s.w. 17.2 m., cross stream from s.w. 17.4 m., cross large tributary from s.w., without a bridge. A valley runs up to the s.; the sides are covered with an immense forest of dead pine. 17.9 m., stream enters river from n.e. 19 m., town of Chêng-Yuan, altitude 9021 feet; stream enters river from n.e. From Hung-Ngai-Kuan to Chêng-Yuan the sides of hills are steep, and covered with a most luxuriant growth of trees; the road keeps quite close to the stream, and is very good, except at about  $1\frac{1}{2}$  mile above Chêng-Yuan, where it crosses a rather large stream without a bridge.

8th.—*Chêng-Yuan to Shih-Chia-P'u*, descending the Hsiao-Ho.—2 m., cross stream from s.w. 5 m., cross stream from s.w. 7 m., cross stream

from s.s.w. 1.5 m., cross river to left (s.) bank. 2.2 m., cross stream from n. by bridge. 3.2 m., very small bamboo only 3 or 4 feet high, not cultivated, but growing luxuriantly. These are used instead of straw. 4.2 m., cross stream from n.e. 4.7 m., cross stream from e. 5.3 m., cross stream from e. 5.6 m., village of Yueh-Erh-Ngai, altitude 7874 feet. At this point a wall of rock rises up on both banks, 500 feet high, almost vertically. There are few habitations on the road, which is a very bad one; great sharp-pointed rocks lie about everywhere. Cross river by bridge to right (s.) bank. 5.9 m., cross stream from w. 6.2 m., houses; cross stream from s.w. 6.5 m., cross stream from s.w. 6.8 m., house; stream enters river from n.e. Here the gorge closes in narrower everywhere. Almost perpendicular rocks separated by only a few yards. Foliage still luxuriant; cultivation impossible. 7.6 m., cross stream from s.w. 7.8 m., cross stream from s.w. 8 m., cross river by bridge to left bank. 8.3 m., perpendicular wall of rock 500 feet high. 8.9 m., cross river by bridge to right bank. 9.3 m., cross river by bridge to left bank. 9.8 m., two little level spaces in the valley closed by rounded hills, and separated by a low point. 10.4 m., cross stream from s.w. 10.6 m., from this point to the end of the gorge, s.e., the gorge is very narrow. Perpendicular precipices on both banks of the river from 300 to 500 feet high. 11 m., cross river by bridge to right bank. 11.9 m., house beside road, altitude 6574 feet. Stream enters river from n.e. 12 m., cross stream from s.w. 12.4 m., cross river by bridge to left (s.) bank. 12.7 m., from Chêng-Yuan to this point, the river runs through a narrow gorge generally about 100 yards wide, closed by steep and precipitous hills. The bed falls very rapidly, the river making a succession of waterfalls. The steep sides and river-bed are everywhere densely wooded with the richest green, to the water's edge; there is no cultivation whatever. All affluents flow through narrow gorges. This gorge becomes narrower and more narrow, until at Yueh-Erh-Ngai the walls of rock rise up vertically, only separated at the top by a few yards. The gorge ends suddenly at this point. The rocks are all limestone. East of this point the river runs between rounded and cultivated hills. 13.5 m., cross stream from s. 14.2 m., Shih-Chia-P'u, altitude 5995 feet. East of Shih-Chia-P'u the slopes are steep on both sides, but where they are not steeper than 30°, are cultivated. Where they are not cultivated the sides of the valley are covered with grass and brushwood.

9th.—*Shih-Chia-P'u to Yeh-T'ang*, descending the Hsiao-Ho on left (s.) bank.—.5 m., cross stream from s. 1.4 m., cross stream from s. A precipitous gorge runs up to n.e.; the road rises 300 feet above the river. 2.4 m., stream enters river from s.s.e. 2.6 m., pomegranates in blossom. 3.1 m., cross stream from s. Village, with the first patch of rice. 4.4 m., cross stream from s., which runs through a precipitous gorge. Village. Stream enters river from s.; a precipitous gorge runs up s.w. 4.8 m., hills rise to 2000 feet above river on both sides, sloping about 45°. 5.2 m., cross stream from s.; village. 5.8 m., cross stream from s. 6.5 m., hills bounding the valley on the s.w. are precipitous. 6.9 m., the hills on the s.w. are less steep, and are cultivated. There is a little open space in the valley here. 7.3 m., cross stream from n.e., which runs through wooded gorge. 8.2 m., pagoda between road and river. Cross stream from n.e. Deep and precipitous gorge. 8.4 m., Hsiao-Ho-Ying, a walled town dominated by hills quite close; altitude 5297 feet. Here is a "Patsung" and twenty-five soldiers. s.s.e. of Hsiao-Ho-Ying, the hills are covered with grass and brushwood, sloping about 45°; there is little cultivation on them. 9.3 m., a precipice bounds the valley on the w. 9.8 m., cross stream from n.e. 10 m., here the river enters a gorge, and is bounded on the e. by precipices. 11.1 m., stream enters river from s.w. 11.8 m., village; cross river by covered bridge to right (s.w.) bank. The gorge opens out here, but the hills that bound the river on the e. are still



very steep. 12 m., stream enters river from E. 12.2 m., a deep and precipitous gorge runs up to the N.E., and separates the precipitous and uncultivated from the sloping and cultivated hills on the left bank of the river. Hills on the S.W. are cultivated. 12.8 m., village; bamboo cultivated here. 13.6 m., a short, but very close gorge; precipices rise up from the river on both sides. 14.1 m., cultivated hills bound the river on both sides. 16.1 m., cross river by iron suspension-bridge to left (N.E.) bank. Cultivated hills 500 feet high, sloping 30° down to river. 16.8 m., town of Yeh-T'ang; altitude 4339 feet. Hills about 500 feet high, sloping 30°, and all cultivated. Here is a ferry across the river, the boat being made fast to a rope stretched from one bank to the other. From Shih-Chia-P'u to Yeh-T'ang the road is very fair, with very little up and down. In some places it is bad and rocky, but these are very short. There was some holly and wild strawberries.

10th.—*Yeh-T'ang to Shui-Chin-Chan*, descending the Hsiao-Ho on left (N.) bank.—5 m., cross stream from N.E. 9 m., cross stream from N.E. 1.4 m., stream enters river from S.W. 2.3 m., cross stream from N. Mountain on left of road, 3000 feet above the river, throwing down spurs broken by cliffs; all the sloping parts are cultivated with Indian corn. Hills on both sides of river are about 1000 feet above it. 2.7 m., stream enters river from S. Hills on the N.E. steep and precipitous. 4 m., a precipice and cliffs bound the river on right bank. 5.2 m., Shui-Ching-P'u, altitude 3962 feet. Cross stream from N. Low spurs on both sides of river, precipitous in places; the slope cultivated with Indian corn. 5.6 m., mountain on right bank of river 3000 feet high. 6 m., cross stream from N. 6.1 m., stream enters river from S. 6.7 m., cross stream from N.; slopes of hills on both sides precipitous and broken. 7.1 m., hills on right bank about 1000 feet above river, throwing out spurs, ending in cliffs, close down to river; between the spurs the ground is cultivated with Indian corn. 7.6 m., stream enters river from S.E. Hence to 9.7 m., hills on both sides about 1500 feet high; slopes 30°, well cultivated with Indian corn; there are also a good many trees. 7.9 m., stream enters river from S.E. 9.7 m., cross stream from S.W. 10 m., stream enters river from S., in a wooded and precipitous gorge. Gold-washing in bed of river. 10.7 m., village; a few trees in the valley. 10.8 m., stream enters river from S. 11.2 m., cross stream from N. 11.4 m., Shui-Chin-Chan, altitude 3675 feet; spurs cultivated. A peak, 1500 feet high, 1 mile to S. of river, cultivated below and wooded above. From Yeh-T'ang to Shui-Chin-Chan, there is, close to the river where flat ground can be found, a little rice cultivation; the chief crop is still Indian corn; a little wheat and tobacco are also grown. A crop of opium has already (June) been gathered from the fields where the rice is now cultivated. The road from Yeh-T'ang to Shui-Chin-Chan is fair; but bad in places where it rises above the river. Occasionally it is scooped out of the face of precipices; in other parts supported on stakes driven into the face of the cliff.

11th.—*Shui-Chin-Chan to Ko-Ta-Pa*, descending the Hsiao-Ho on left (N.E.) bank.—2 m., cross stream from N.N.E. About 1½ mile to N.E. begins a steep, precipitous, wooded ridge, 1500 feet above river, throwing off low spurs to river, which are cultivated. This ridge runs in an easterly direction about 3 miles. 1.6 m., hills here become steeper. 1.8 m., cross stream from N. 2.2 m., stream enters river from S. 3.1 m., cross stream from N. 3.3 m., a steep mountain about ¼ mile S. of river, 1500 feet high, a little cultivated. 3.7 m., cross stream from N.E.; village. Wooded hills on left of road 1500 feet above river. 4.2 m., cross stream from N. 4.6 m., hills rise 1500 feet at an angle of 60° on both sides of the river, very little cultivated. 5.7 m., stream enters river from S.W. A peak, 1 mile to S.W., 2000 feet above river. The top is wooded; its slopes are very broken, and it is precipitous at edge of river. 6.2 m., stream enters river from S.W. A low cultivated spur from the

peak; slopes easy and cultivated. Slopes on left bank, steep and wooded. 6.5 m., cross stream from N.E. 6.8 m., slopes on left bank, much broken by rocks and cliffs, run up to a rugged ridge 1500 feet above river. 8.3 m., gold-washing in river. Very steep ridge on right bank 1500 feet high, sloping 30°; cultivated below. 8.8 m., cross large stream from N. by covered bridge. Ko-Ta-Pa, altitude 3391 feet. Steep slopes to N.E. Rice-planting going on.

12th.—Ko-Ta-Pa to Lung-An-Fu, descending the Hsiao-Ho on left (N.E.) bank.—8 m., cross stream from N.E. 1.8 m., stream enters river from S.W. Peak 1½ mile S.W. of river, 1500 feet. 1.9 m., stream enters river from S.W. 2.3 m., cross stream from N.E. Peaks 1 mile from left bank, 1500 feet above river; partly cultivated, partly wooded. 2.7 m., mountain on right bank 2000 feet high; wooded and partly cultivated. 3.2 m., a remarkable long rocky point, running out into the river from N.E., flanked on both sides by spurs from the mountain on the opposite (S.W.) side of the river. 3.9 m., a projecting point, from which a zigzag leads to T'i-Tzu-Yi. 4 m., village of T'i-Tzu-Yi, altitude 3283 feet. The hills on left bank are steep and precipitous. From Shui-Chin-Chan to T'i-Tzu-Yi, the road is very fair; at the salient points it is generally far above the river, and cut out of the rock; in some places it is propped up from below. The points that project into the river from its left (N.E.) bank are more precipitous on their N.W. sides. The rocks are of limestone, generally striking E. and W. A ridge, 1500 feet high, extends from Shui-Chin-Chan to T'i-Tzu-Yi, about 1½ mile from left bank of river. 5.1 m., cross stream from N.; village. 6.1 m., cross stream from N. 8.9 m., cross stream from N. 10.1 m., stream enters river from S.W. From T'i-Tzu-Yi to this point, mountains on both sides vary from 1000 to 2000 feet above the river, sloping 30° to 60°. The slopes that are not steeper than 30° are cultivated. The steep slopes are covered with grass, small trees, and brushwood. On the S.W., one long ridge rises straight up from the river, and its crest follows every bend of the stream, which twists and turns about a great deal. Between this point and Lung-An-Fu, the hill-sides on right bank are very steep, and there is scarcely any cultivation. A raft was seen on the river here. 11.6 m., cross stream from N.E. Very precipitous hills rise up from the river on both banks. 11.9 m., a very high precipice on right bank. 12.6 m., town of T'ieh-Lung-Kuan, situated on a long rocky point projecting out into the river; altitude 3150 feet. From this point a zigzag leads down to the E. face of the rocky point, to the large stream that runs in here; and from the bridge to Lung-An-Fu the road is exceedingly bad, for more than half the distance through a niche cut out in the face of a precipice, or supported from beneath. In some places where there have been great landslips, huge blocks of stone lie about, over which it is very difficult for coolies and mules to travel. 12.8 m., cross large stream from N.E. by iron-chain suspension-bridge. 15.2 m., very pretty village, with a great many trees. 15.3 m., cross stream from E.N.E. Here the river is closed in on both sides by steep and precipitous hills, 1500 to 2000 feet above the river, almost everywhere too steep for cultivation; but wherever there is the smallest patch not steeper than 30°, there Indian corn is grown. 17 m., peaks on both sides of river, 3000 feet high. 18 m., city of Lung-An-Fu, situated on a spur that runs down to the river, the wall of the city going, for about a mile, up this spur. Part of the city is called P'ing-Wu-Hsien. Pagoda ¼ mile to S., on opposite side of river, 500 feet high. A little to W. of Lung-An-Fu, the valley opens out a little; the hills are rounded, and all cultivated. There is a little level ground just above the bed of the river. Wherever there is a little flat ground just down by the water's edge, rice is planted, but the space for it is very limited. The crops are chiefly Indian corn. The rocks are of hard black limestone, with veins of quartz and layers of slaty shale striking E. and



w., dipping about  $45^{\circ}$ . At Lung-An-Fu the valley of the river is  $\frac{1}{2}$  mile to 1 mile wide.

13th.—*Lung-An-Fu* to *Kuang-Yi*, descending the Ta-Ho (as the Hsiao-Ho is now called) on left (N.) bank.—5 m., stream enters river from S. 1 m., cross stream from N.N.E. 2 m., the river here has evidently once been at a higher level, and the valley has been an ancient lake, in which clay and rounded stones were deposited. The river has cut its way through this deposit to a depth of from 30 to 60 feet, so that at the base of the hills there are many small, flat plains, whose surfaces are all on the same level. 4.4 m., mountains, 3000 to 4000 feet high, on both sides of river. Gentle slopes well cultivated in bed of river, and a good deal of wood. 8.5 m., village of Ku-Ch'eng, altitude 2890 feet. From Lung-An-Fu to Ku-Ch'eng, the road is good, only rising a little here and there to cross the spurs, but there are no difficult places. Hills on right bank of river are all cultivated, and slope down to the water. Mountains behind them, to the S.W., 3000 to 4000 feet high, with forests at the top, and well wooded in the ravines. The crops are chiefly Indian corn and beans. The Tung-oil tree appears again, also *Eriobotrya Japonica*, of which great quantities of the fruit are sold. Apricots and cucumbers are also for sale. 8.6 m., cross stream from N.E.; there is a good deal of rice in the valley of this stream. 10.2 m., cross stream from N.N.E. 10.3 m., the road here is 200 feet above the river, and follows the steep side of a slope much broken with precipices and cliffs. A mountain, S. of river, 3000 feet high, throwing out spurs; these are broken in places with cliffs. 12.1 m., cross stream, from N.E. Slopes on left of road broken with cliffs; little cultivation on them. 13.4 m., a long, low, projecting point from S. bank of river. At the bottom of this point, the limestone rock is seen, and above it, the deposit of clay and rounded stones. This point so nearly joins the left bank, that it is here, in all probability, that the river was blocked. 13.7 m., cross stream from N.E. 14.4 m., the mountain to the N.E. throws out a precipitous rocky spur. 14.8 m., cross stream from E. There is a very good iron-chain bridge across this stream, not yet quite complete, with exceedingly well-built stone piers; the droop in the centre is very slight. Village of Kuang-Yi, altitude 2811 feet. From Ku-Ch'eng to Kuang-Yi the road is fair, but for two or three bad places. There are many mulberry-trees. Cocoons in valleys put out to dry in the sun; people spinning silk.

14th.—*Kuang-Yi* to *Chiu-Chou*, descending the Ta-Ho on left (N.E.) bank.—9 m., precipices on both sides of river. 1.3 m., village, a good deal of mulberry and Tung-oil trees. 2.5 m., cross stream from N. 3 m., cross stream from N.N.E. 3.6 m., cross stream from N.N.E. Hills on left of river less steep, cultivated, and wooded. A low sloping spur on right bank; above the spur is a mountain, precipitous on its N.E. face towards the river, and sloping on its S.E. face towards the stream. 4.3 m., stream enters river from S.W. 5 m., cross stream from N.E. 5.2 m., hills steep and wooded on both sides of river, cultivated, and broken with cliffs, sloping  $30^{\circ}$  down to water. 6.2 m., cross stream from N.E. 6.5 m., village of Hei-Shui-Kou, altitude 2700 feet. Hills steep and wooded, cultivated, and broken with cliffs. Stream enters river from S.W. From Ku-Ch'eng to Hei-Shui-Kou the valleys on both sides of the river open up to high mountains N.E. and S.W., with easy slopes nearly all cultivated, and patches of wood. Peaks immediately over river rise to 2000 feet, sloping  $60^{\circ}$  down to water. 7.2 m., easy slopes on right bank. 7.5 m., cross stream from N.N.E. Slopes on left bank cultivated, and broken with cliffs. 9.8 m., precipices on right bank 800 feet high. 10.5 m., cliffs on right bank. 10.9 m., village; road to N.E. leading to Shen-Si. 11 m., wall of rock on right bank. 11.5 m., easy slopes on both sides. 11.8 m., cross stream from N.E. 12.3 m., cross stream from E.N.E. by covered wooden bridge.

12.4 m., village. 13.2 m., cross stream from E. 14.2 m., hills steep and craggy on both sides of river. 14.4 m., cross stream from E. 15.5 m., on both sides of river hills rise to 1000 feet, sloping 15°. 16.6 m., village of Chiu-Chou, altitude 2560 feet. Stream enters river from N. Cross river by ferry to right bank.

15th.—*Chiu-Chou* to *P'ing-I-P'u*, descending the Ta-Ho on right (W.) bank.—1 m., a piece of level ground on right of river all cultivated with Indian corn; no rice. Hills broken. From Chiu-Chou to 3 m., on left bank, hills rise to 400 feet, sloping 30°. The level ground at the base of the hills is cultivated with Indian corn. 2.7 m., hills on right bank broken, sloping 30°. 3.6 m., cross stream from S.W. Hence to 7 m., hills 2000 feet high on both sides of river, sloping 30° down to the water, but much broken with cliffs and precipices. 4.1 m., cross stream from W. 6.7 m., village; cross stream from W. by covered wooden bridge. 7.2 m., precipice over river on right bank. 7.4 m., slopes on left bank 60°, steep and craggy. 7.9 m., slopes on right bank 60°, craggy with ravines. 8.1 m., slopes on left bank 5°; a very open valley, with an isolated rock in the centre. 8.3 m., stream enters river from E. with gentle slopes. 9.6 m., village of Hsiang-Ngai-Pa, altitude 2412 feet. Hills on right bank sloping 15°; on left bank steep and craggy. E. and W. of Hsiang-Ngai-Pa are mountains 2000 feet high, sloping 30°. Here the river is navigated by boats. 10.6 m., cross stream from W.N.W. 11.1 m., cross stream from W.N.W. 12.6 m., village; river-bed wide here. On W. of river, a ridge, 2000 feet high, extends for 4 miles in a N.W.-S.E. direction. From Hsiang-Ngai-Pa to this point are low spurs along left bank, with mountains behind 2000 feet high, sloping 30°, and a good deal of flat ground in the valley. 12.7 m., cross stream from S.W. by stone bridge of one arch. Hills on left bank steep and broken. 14.8 m., hills on left bank 1000 feet above river. 15.6 m., stream enters river from N.E. Mountain to E., 3000 feet high. Undulations on right bank, leading gradually up to mountains from 1000 to 2000 feet high. 16.8 m., village of P'ing-I-P'u, altitude 2464 feet.

16th.—*P'ing-I-P'u* to *Chung-Pa-Ch'ang*, descending the Ta-Ho in boat.—3 m., stream enters river from W. 9 m., stream enters river from N.E. 1.7 m., rapid; village on right bank. 2.2 m., rugged slopes on right bank; peak on left bank, 2000 feet high, with wall of rock at the top. 2.5 m., cliff on left bank, 200 feet high; hills on right bank, 1500 feet high. 2.9 m., walls of rock on both sides of river; cliffs on right bank, 200 feet high. 3.3 m., slopes on right bank, running up to peaks 1500 feet high. 3.7 m., stream enters river from S.W., flowing through a wooded valley. 4.1 m., rapids; very broken slopes on right bank; remarkable peaks, 2 miles to the E. 4.7 m., stream enters river from N.E. 5.1 m., valley, on right bank, leading up to a sloping mountain. 5.7 m., rapid; stream enters river from N.E.; steep wooded slopes up the valley. 6 m., stream enters river from S.W.; wooded slopes on right bank, 700 feet high. 6.3 m., low, flat point on left bank, with wide valley. 6.8 m., stream enters river from E.N.E. 8.3 m., rapid; low, rounded hills on right bank. 8.5 m., rapid. 9 m., on right bank, mountain 1500 feet high, sloping 45°; on left bank, easy, wooded slopes; high mountains to E. 9.2 m., long, low point on left bank. 9.5 m., village on left bank, wooded spur, 200 feet high; cliff, 50 feet high, on right bank. 9.8 m., hills on both sides, 100 feet high, rocky on right bank. 10.3 m., rapid; stream enters river from W.; white cliff, on right bank, 30 feet high. Hence to 14.2 m., river flows through a flat plain. 10.8 m., mountain, 2 miles to E., 1500 feet high, sloping 45°. 11.9 m., town of Chiang-Yu-Hsien, on right bank, altitude 2211 feet. 13.3 m., village on right bank. 14.1 m., village on right bank. 14.3 m., pagoda on hill 200 feet high, near right



bank. 14.6 m., rocky hills 100 to 200 feet high, well wooded, on both sides of river. 15.2 m., rapid; village on left bank. 15.6 m., broken and rocky ground with many trees, on right bank. Hence to 16.7 m., plain  $\frac{1}{2}$  mile broad, with many trees. 16.4 m., village on right bank. 16.7 m., rapid. 16.9 m., wooded slopes on left bank, 100 feet high from river. 17.6 m., village on right bank; plain  $\frac{1}{2}$  mile wide, to w. 18.1 m., rapid; river 70 yards wide. 18.5 m., from this point to near Chang-Ming-Hsien, the country is a flat plain bounded on right bank of river by a long ridge of flat-topped hills 100 feet high; to the west of these are mountains 2000 feet high, at a distance of 5 miles from the river; and on the left bank there are hills 3 or 4 miles to the e. 19.3 m., rapid. 20.7 m., shallow, and rapid. 21 m., shallows. 21.4 m., shallows. 21.6 m., rapid. 22.2 m., village of Chung-Pa-Ch'ang on right bank, altitude 2064 feet.

17th.—*Chung-Pa-Ch'ang to Mien-Chou*, descending the Ta-Ho in boat. —4 m., shallows. 1 m., village on right bank. 1.4 m. to 1.8 m., three rapids; many trees on left bank. 2.8 m., rapid; low, red, wooded hills, with little cultivation, on left bank. 3.2 m., rapid. 3.4 m., village of Chang-Ming-Hsien on right bank, altitude 1949 feet; on left bank, low, wooded hills, 300 feet high, sloping 30°, little cultivation. 4.2 m., rapid; river 100 yards wide here; low hills on left bank, retreating from river; pagoda near left bank, on hill 50 feet high. 4.6 m., low hills on right bank, close down to river side. 6.2 m., flat ground on right bank of river; distant mountains to w. 6.7 m., village on right bank; hills on left bank 60 feet high. 7.3 m., rapid. 7.4 m., rapid. 7.6 m., village on right bank; hills to w., 100 feet high. 8.6 m., pagoda on hill, 50 feet high, near left bank. 8.9 m., rapid. 9.8 m., low hills both sides of river. 10.6 m., rapid. 11.8 m., rapid. 16.9 m., rapid; village on left bank; pagoda  $\frac{1}{2}$  mile from right bank. 18.1 m., rapid; village on right bank. 21.3 m., stream enters river from n.s.e. The ground between this point and Mien-Chou is flat. 22.2 m., rapid. 22.5 m., rapid. 23 m., low, rocky point with low pagoda, on left bank. 23.3 m., city of Mien-Chou, altitude 1918 feet.

18th.—*Mien-Chou to Lo-Chiang-Hsien*.—Leave Mien-Chou by west gate. .6 m., cross river running s.e.; ascend right bank of river to 6.8 m. The road runs through a flat plain, which is bounded on both sides by low ranges of hills or undulations 50 to 100 feet high, coming down to within 1 mile of the river on the s.w. The crops on this plain are mostly Indian corn, and a good deal of ground-nuts, beans, and rice. 3 m., cross stream from s., village. From this point to 4.8 m. is an amphitheatre of plain between the hills on the s. and the river. To the s.w. of the river is an extensive plain, to beyond Chao-Chiao-P'u. 6 m., town of Chao-Chiao-P'u. 6.8 m., here the road to the s.w. leaves the stream, and enters an undulating country, very dry, and suffering for want of rain. The crops are Indian corn, ground-nuts, and beans, and a very little rice. 9.3 m., village of Hsin-P'u, altitude 2078 feet. From this point to the s.w. the road follows an undulating ridge. 10.9 m., source of stream flowing s.e. 13.5 m., village. From this point to 15.2 m. the road runs through a flat plain. 14.8 m., cross stream flowing s.s.e. 16.5 m., village. 17.1 m., leave the main road, and proceed along a road to the s.w., which is only passable in dry weather; cross two branches of the river by two bridges—these bridges are made by drawing in piles of stone and laying slabs across. 18.4 m., cross the Lo-Chiang-Ta-Ho, by bridge, to right (w.) bank. 19.5 m., suburb of Lo-Chiang-Hsien. 19.8 m., north gate of Lo-Chiang-Hsien. 20.6 m., in town of Lo-Chiang-Hsien, altitude 2033 feet. The regular road crosses the river by a fine bridge, and enters the east gate of the town. The valley of the river is very fertile, and was not suffering from want of water; the crops looked well.

19th.—*Lo-Chiang-Hsien to Han-Chou*.—Leave Lo-Chiang-Hsien by west gate. .7 m., altitude 2047 feet. 1.1 m., cross stream flowing s.s.e.; altitude 2009 feet. 2.4 m., altitude 2232 feet; the road runs through the Pai-Ma-Kuan, or Pass of the White Horse. 3.5 m., very small village, altitude 2047 feet. 3.7 m., cross stream flowing w.s.w. 4.3 m., village, altitude 2081 feet. 4.6 m., cross dry bed of a stream. 4.9 m., road passes over summit of a hill, on which is a temple. 5.5 m., cross stream flowing s.e., altitude 2033 feet. 5.9 m., cross stream flowing s.e. 6.2 m., cross sandy bed of a river, flowing s., which is  $\frac{1}{2}$  mile wide at this point. There is a bridge  $\frac{1}{2}$  mile below crossing. 6.9 m., town on right bank. 7.5 m., cross stream flowing s.e. 7.8 m., village. 8 m., cross stream flowing s.e. 9.6 m., cross stream flowing e. by bridge 50 yards. 10.5 m., village. 11.2 m., village. 11.7 m., cross stream, which runs into large river on left of road flowing s. past Tê-Yang-Hsien. Hills 3 m. distant on opposite side of river, 200 feet high. 12.5 m., cross stream from w. flowing into river. 13.2 m., suburb of Tê-Yang-Hsien. 13.4 m., n.e. gate of Tê-Yang-Hsien. 13.7 m., city of Tê-Yang-Hsien, altitude 1983 feet; stream runs through n. of city from w. to e. From 5.5 m. to Tê-Yang-Hsien, the road passes over a flat plain. 14.3 m., s.w. gate of Tê-Yang-Hsien. Cross stream flowing e. 14.5 m., suburb of Tê-Yang-Hsien. 14.7 m., cross stream flowing e. 15.1 m., pagoda  $\frac{1}{2}$  m. to left of road. 15.7 m., village. 16.3 m., cross large stream flowing w.; village. 16.8 m., cross very dry, rushy bed of a river, 3 m. wide, with many channels, flowing s.e. 22.8 m., cross stream flowing e. 23 m., cross stream flowing e. 23.4 m., cross river flowing e., by very high stone bridge of 3 arches; village on both sides. 23.8 cross stream flowing e. 24.8 m., suburb of Han-Chou, with 8 pilos. 25.4 m., cross stream flowing e., by stone bridge; pilos with stone across. 25.6 m., cross stream flowing e. by covered wooden bridge of 32 spans of 12 feet each. 25.8 m., n. gate of Han-Chou.

20th.—*Han-Chou to Ch'eng-Tu*.—Leave Han-Chou by west gate. 1 m., cross stream flowing e. 1.2 m., cross stream flowing e. 1.4 m., cross river 90 yards wide, flowing from s.w. to e., by stone bridge. 2.5 m., cross stream flowing e.; village and pilo. 3 m., cross stream flowing e. 3.4 m., village, 3 pilos; cross stream flowing e. by high stone bridge, 2 arches, 65 yards. 3.8 m., cross stream flowing n.e. 4.8 m., village and pilo. 5.2 m., cross stream flowing e. 5.3 m., river on left of road 30 yards, flowing n.e. 5.7 m., cross large stream flowing e.s.e. 5.9 m., cross stream flowing e., by covered wooden bridge, 50 yards. 6 m., cross stream flowing e.s.e., by stone arch bridge, 40 yards. 6.1 m., cross stream flowing e.s.e. 6.2 m., village of P'i-T'iao-Ch'ang. 6.4 m., cross stream flowing e. 6.7 m., cross stream flowing e. 7.4 m., cross stream flowing e.s.e. 8.2 m., cross stream flowing e. 8.4 m., cross stream flowing e. 9 m., village; cross stream flowing e., by bridge, 20 yards. 9.3 m., tea-house. 9.7 m., cross stream flowing e.s.e. 10.2 m., cross stream flowing s.e. 10.6 m., cross stream flowing e.; village, 2 pilos. 10.8 m., cross stream flowing e. 11.2 m., east gate of Hsin-Tu-Hsien. 11.8 m., west gate of Hsin-Tu-Hsien. 12.1 m., cross stream flowing e.; pilo. 12.5 m., cross stream flowing e.s.e. 13.6 m., cross river from n., flowing e.s.e., by stone bridge, 80 yards. 13.8 m., cross stream flowing e. 14.1 m., pilo; cross stream flowing e.s.e., by stone bridge, 50 yards. 14.4 m., cross stream flowing e.s.e. 14.7 m., cross river from s.s.w., flowing e., by stone bridge of 5 arches, 30 yards; road continues on right bank of this river for 2 miles. 16 m., village, 3 pilos. 19 m., cross stream flowing e.s.e. 20.6 m., pilo; cross stream flowing e.s.e.; suburb of Ch'eng-Tu. 22 m., north gate of Ch'eng-Tu, altitude 1504 feet.

July 10th.—*Ch'eng-Tu to Shuang-Liu*.—Starting from the temple—Wu-Ho-Tz'u—where Liu-Pi is buried, outside the s.w. wall of Ch'eng-Tu. .4 m., cross stream flowing e. .6 m., tea-house. .8 m., cross stream 10 yards wide,



flowing s.e. 1.1 m., cross stream flowing s.e.; village. 1.7 m., cross stream flowing s.e. 2.7 m., cross stream 10 yards wide, flowing s.e. 3.1 m., cross stream flowing s.e. 3.4 m., town of Tsu-Ch'iao, altitude 1575 feet. 3.8 m., cross river flowing s.w.; cross it again at 4.6 m., flowing s. 4.8 m., village. 4.9 m., cross river 40 yards wide, flowing s. 5.7 m., village. 6.2 m., cross stream flowing s.e. 6.8 m., cross stream flowing s.e. 7 m., cross stream flowing s.e. 7.1 m., 2 pilos. 7.4 m., enter Shuang-Liu by n.e. gate; altitude 1647 feet.

11th.—*Shuang-Liu to Hsin-Chin-Hsien*.—Leave Shuang-Liu by s. gate. .6 m., cross stream 5 yards wide, flowing s.e.; pilo, and pagoda of 13 stories. 1.7 m., cross stream 10 yards wide, flowing s.e.; village. 3.7 m., cross stream flowing s.e.; village. 3.8 m., cross river 40 yards wide, flowing s.e., by a bridge called Kao-Ch'iao (High Bridge). Hills on left of road, 100 feet high, called Mu-Ma-Shan (Wood-Horse Hill). These hills run parallel to the road almost as far as Hua-Ch'iao-Tsu, increasing in elevation to 200 feet. 5.6 m., cross stream flowing s.e. 5.9 m., Chan-To-P'u, market town. 6.7 m., cross stream flowing s.e. 7 m., cross stream flowing s.e. 7.1 m., huts. 7.9 m., fine grove of firs, bamboos, and trees, with houses amongst them, on right of road. 8.3 m., houses and small cottages with large gardens, separated from one another by about 100 yards. 9.8 m., town of Hua-Ch'iao-Tsu, altitude 1532 feet. The road from Ch'eng-Tu to this town, which is very good and broad throughout, passes over a perfectly flat plain; soil, a grey clay. The country is entirely under rice cultivation, nothing else, except round the houses and in gardens. Many separate farmhouses scattered about, surrounded by trees and bamboos. There are many minor streams on both sides of the road, besides those mentioned. 10.2 m., cross stream 10 yards wide, flowing s.e. 11.8 m., village. 12 m., cross stream flowing s. 12.2 m., cross dry bed of river with many rushes in it; two channels of water flowing s., one, 50 yards wide, 2 miles an hour, the other 30 yards wide; ferry across each. 12.7 m., cross stream flowing s. Pagoda, 150 feet high, on hill 1 mile on left of road. Temple near road on right. 12.8 m., suburb of Hsin-Chin-Hsien; 2 pilos. 13 m., enter Hsin-Chin-Hsien by e. gate, altitude 1595 feet; 2 pilos. Hills of red sandstone, well wooded, 200 feet high, 1 mile to s.

12th.—*Hsin-Chin-Hsien to Ch'ung-Chou*.—Leave Hsin-Chin-Hsien by w. gate. .4 m., cross stream flowing s. into the Hsi-Ho. .9 m., cross stream 10 yards wide, flowing s. into the Hsi-Ho; many pilos. 1 m., village. 1.2 m., cross stream flowing s. into the Hsi-Ho, by covered bridge. Nothing but rice cultivated here; some of the rice-fields looking dry. 2.2 m., cross stream flowing s. into the Hsi-Ho. 2.6 m., cross 2 streams with stone bridges, affluents of the Hsi-Ho. From Hsin-Chin-Hsien to this point, the road is on left (s.) bank of the Hsi-Ho, which flows to the s.e. Its banks are 25 yards wide; there is scarcely any current. 4.6 m., cross stream flowing s.; tea-houses. 4.9 m., cross stream flowing s. 6 m., town of Yang-Chia-Ch'ang, altitude 1585 feet; very good inn. 6.4 m., cross bed of a large river almost dry, bank 12 feet high, reddish clay; two narrow channels of water flowing s.; ferries. 6.9 m., pilo; cross stream flowing s. 8.4 m., cross stream flowing s. 9.9 m., cross stream flowing s.e. 10 m., cross stream 12 yards wide, flowing s.e., by bridge of 3 arches. 10.1 m., village. 12.9 m., cross stream flowing s. 13.2 m., first sight of the mountains from this point. 13.8 m., cross stream flowing s.s.w. 14.2 m., village, altitude 1740 feet. 15.5 m., cross stream flowing s. 15.9 m., cross stream flowing s. 16.3 m., cross stream flowing s.; village with pilo. 17.6 m., pilo. 17.7 m., cross stream flowing s. 17.8 m., pilo being erected. 18 m., 4 pilos. 18.2 m., cross stream flowing s. 18.5 m., city of Ch'ung-Chou, altitude 1637 feet; 2 pilos. Pagoda (unfinished), 2½ miles to s.e. The road from Hsin-Chin-Hsien to this town is very good. Country drier than it was farther east. Nothing but

rice cultivation. Detached houses, amongst trees and bamboos; country thickly-wooded. Soil, yellow-grey clay; village streets sometimes paved with conglomerate. The country round Ch'ung-Chou gets very dry. Scarcely any water. Some of the rice in flower. Road from Ch'eng-Tu over a perfectly flat plain all the way, to this city.

13th.—*Ch'ung-Chou to Pai-Chang-Yi*.—Leave Ch'ung-Chou by E. gate. 1 m., cross the Nan-Ho (bed 100 yards wide), flowing S.E., by bridge of 15 arches, 240 yards long, and 94 yards wide, with 3 pilos. 1.1 m., village; pagoda on hill,  $\frac{1}{2}$  mile to left of road. 1.6 m., village. Road on crest of wooded hill, 100 to 150 feet high, for  $1\frac{1}{2}$  m. Reddish-yellow clay, slopes uncultivated, chiefly covered with fir-trees. The flat parts chiefly rice, beans, Indian corn, and a little cotton. Bamboos here are very small. 3 m., cross stream flowing N.W. 3.4 m., cross stream flowing N.W. 3.5 m., pilo. 3.8 m., cross stream flowing E. 4.5 m., village. The road hence to near Pai-Chang-Yi follows crest of an undulating ridge, about 100 feet above the valley, and is exceedingly tortuous; it is very good, but not so good as it is farther east. About half the country is given over to the cultivation of rice, beans, and Indian corn, also a little cotton. The remainder is well wooded with firs, and a small tree with a leaf like a chestnut; there are also a good many poor bamboos. All the country on both sides of the road is undulating, and though there are no large woods, it has all the appearance of being densely wooded, owing to the numbers of large clumps of trees, which also generally limit the view to about 100 yards in any direction. There are a good many detached houses, but not many villages. Soil, reddish-yellow clay. 7.8 m., town of Ta-T'ang-P'u, altitude 1681 feet. 10.7 m., market town. 13.4 m., village. 14.2 m., cross stream flowing E.S.E. 14.5 m., cross the Pai-Chang-Ho, flowing E.S.E., by bridge of 5 arches, called Tung-Ch'iao. 14.6 m., town of Pai-Chang-Yi, altitude 1920 feet.

14th.—*Pai-Chang-Yi to Ya-Chou-Fu*.—2 m., cross stream flowing N.E., into the Pai-Chang-Ho. Hills to S., 150 feet high. 3.7 m., temple and tea-house. 5.1 m., village. 10.4 m., 2 pilos. 10.5 m., cross river flowing E.S.E., by covered bridge 70 yards long. 10.7 m., city of Ming-Shang-Hsien, altitude 1660 feet. Between Pai-Chang-Yi and Ming-Shan-Hsien the country is very undulating, long ridges running N.E. and S.W. The tops of the hills are 200 or 300 feet above the valleys. The tops of the hills and bottoms of the valleys are laid out in terraces for rice; the sides are well cultivated with Indian corn. There are many clumps of trees, chiefly fir, and also 3 sorts of bamboos, some of them very fine. Road along the tops of the ridges. It is paved, but in many places with great round boulders that make travelling very bad. Soil, red and yellow clay, and sand. 24 miles to the W. of Ming-Shan-Hsien, a ridge 1500 feet high, runs in a S.W. direction for about 10 miles. 12.4 m., cross stream flowing S.E. Road from Ming-Shan-Hsien to this point, in a flat valley between two ridges of red sandstone. Rice cultivation. 12.9 m., cross stream flowing E.S.E. Road amongst detached hills of red sandstone, strike N. and S., dip 20°. 13 m., cross stream flowing E. Road ascends stream, which flows through a narrow gorge of red clayey sandstone with precipices on the N.W., on right (S.) bank, to near 14.7 m., summit of pass—Chin-Chi-Kuan, altitude 2036 feet; the hills on either side rise 800 feet above the pass. A ridge 700 feet high runs S.W. to Ya-Chou-Fu, about 1 mile on right of the road; valley between it and the higher ridge behind. Road descends slope of hills to 16.5 m., town of Yao-Ch'iao. The Ya-Ho, flowing E.S.E., about 1 mile S.E. of town. This river runs through a flat and fertile valley, bounded by ridges on both sides; the valley is devoted to rice cultivation, the slopes of the hills Indian corn. 18.1 m., village of Tung-Tze-Yuen. From this point the road passes along the left (S.W.) bank of the Ya-Ho, to near Ya-Chou-Fu, when it crosses to the right bank, and shortly after leaves



the river. A ridge 1500 feet high, 1 mile from right bank. 19 m., cross stream from s.w. 20.2 m., cross stream from s.w. by covered wooden bridge of 7 spans, 66 yards long. 20.3 m., cross the Ya-Ho, to right bank, by a ferry; the bed is about 200 yards wide, water 40 yards, and shallow, current 4 miles an hour. 20.6 m., cross large tributary, from s., of the Ya-Ho, by stone bridge 53 yards long. 21.6 m., s. gate of city of Ya-Chou-Fu, altitude 1671 feet.

15th. — *Ya-Chou-Fu* to *Kuan-Yin-P'u*. —  $\frac{1}{2}$  m. from s. gate of Ya-Chou-Fu to Kuan-Yin-P'u, the road is on left (w.) bank of a river which flows generally n.n.e., turning to e. near Ya-Chou-Fu where it joins the Ya-Ho. 1 m., village; hills to s. 500 feet high, with higher peaks behind. 2.5 m., village; river flows through a gorge, with cliffs 150 feet high on left bank, 200 feet on right bank. Hills on right of river, 500 feet high, very much broken, lower slopes all cultivated. Wide open valley between them and hills behind, 1500 feet high. Hills on left of river, 1500 feet high, cultivated with Indian corn to the tops. Rocks, red sandstone. 3 m., village. 4.5 m., cross stream from w.; hills to w., 500 feet high. A chain of peaks 1500 feet high extends to near Kuan-Yin-P'u, about 1 mile e. of river. 5.4 m., cross stream from n.w.; hills to w., 500 feet high. 5.8 m., cross stream from n.w. 6 m., cross stream from n.w.; hills to w., 500 feet high. 6.4 m., Tzu-Shih-Li, altitude 2004 feet. 6.6 m., cross stream from n.w. 6.9 m., cross stream from n.w., by covered bridge. 7.5 m., cross stream from n.w. 8.2 m., cross stream from n.w.; village. Hills to w. 1500 feet high. 9.4 m., cross stream from n.w. 9.8 m., Kuan-Yin-P'u, altitude 2484 feet. Valley 50 yards wide, entirely cultivated with rice. Stream enters river from w. Hills to s., 150 feet, and to w. 200 feet above river. Slopes of hills all cultivated with Indian-corn. Red sandstone rocks. From Ya-Chou-Fu to Kuan-Yin-P'u, the valley is laid out for rice cultivation; also the slopes of the hills where not too steep; but as Kuan-Yin-P'u is approached the amount of rice diminishes, and at the town itself there is scarcely any. Where the slopes are too steep for cultivation, the country is well-wooded with ash, acacia, fir, a tree called Ch'ing-Mu (dark wood), another called Shui-Kying-Kang (water-oak), the tung-oil tree, and round all the houses and by the roadsides, bamboo of two kinds. The road, which is paved or cut in the rock, is pretty fair, though it rises over one or two of the spurs.

16th. — *Kuan-Yin-P'u* to *Yung-Ching-Hsien*. — Road ascends small stream on left (n.) bank, to .3 m., cross stream from n. Road ascends hill 200 feet, to 1.7 m., summit of pass; Fei-Lung-Kuan, altitude 3583 feet. 4.4 m., village of Kao-Ch'iao; cross stream from s.e. flowing into the Yung-Ching-Ho, by covered bridge 12 yards long. From summit of pass to this village, the road zigzags above the stream, on slope of hill. All the hills cultivated right up to the top with Indian corn. Bamboos grow close to the top, and there are very small patches of rice in one or two places near the summit; the bottom of the valley is all laid out for rice cultivation. On the hill-sides are many trees, sometimes singly, sometimes in twos and threes, or in small or large clumps; there are many trees along the roadside. The houses all surrounded by trees and bamboos; a few fruit-trees, also water-oak, Ch'ing-Mu, firs, ash, acacia, tung-oil trees, and Japonica. 5.7 m., village. 6.1 m., village of Shih-Chia-Ch'iao, altitude 2190 feet. Hills to s., 500 feet above river, sloping 20°, all cultivated with Indian corn. 6.4 m., confluence of stream from e. with the Yung-Ching-Ho. Road ascends the Yung-Ching-Ho on right (e.) bank. 6.7 m., village; river valley  $\frac{1}{2}$  mile wide, hills both sides 500 feet above river, sloping 20°. 7.8 m., Hsin-Tein-Chan, market town. 8.4 m., flat plain  $\frac{1}{2}$  mile wide on w. of river. 9.3 m., cross stream from e. 10 m., spur on left bank 100 feet above river. 10.7 m., cross stream from e. 11.2 m., valley  $\frac{1}{2}$  mile wide, all occupied with river-bed. Hills on w. 100 feet, on e. 1500

feet above river. 11.3 m., cross stream from E. 11.8 m., river divides into two branches, each branch sweeping one bank; rice, and a little Indian corn, between the branches. Cross branch from S. by ferry. 12.5 m., E. gate of Yung-Ching-Hsien, altitude 2299 feet. A plain to N.,  $\frac{1}{4}$  mile wide between road and river, with rice cultivation. Hills to N. of river 200 feet high, sloping 20°; behind these hills is a range 1500 feet high. Hills to S., 100 feet, sloping 20°. Hills, red sandstone cultivated with Indian corn. Road from Kuan-Yin-P'u to Yung-Ching-Hsien very fair for a mountain road, but rough in places.

17th.—*Yung-Ching-Hsien to Huang-Ni-P'u*, ascending W. branch of the Yung-Ching-Ho, on right (S.) bank; for the first two miles,  $\frac{1}{4}$  m. distant. Leave Yung-Ching-Hsien by W. gate. 1 m. cross stream from S. Hills to N. of river 600 feet; cultivated with Indian corn to the top. 1.4 m., village. Hills to S. 300 feet high, slope 15°. 2 m., river-bed 300 yards wide with two channels. 3.3 m., village. Hills on N. of river 600 feet high, all cultivated with Indian corn up to the top; pagoda near summit. 3.7 m., cross stream from S.E. 4.1 m., road leaves main river and ascends a tributary on its right (E.) bank. 4.4 m., village; valley  $\frac{1}{2}$  mile wide. Ridge 800 feet high on W., sloping 20°. 4.8 m., cross stream from S.E. 4.9 m., village; hills on left of road 800 feet above river, sloping 20°, cultivated with Indian corn. Flat valley 200 yards wide. 5.5 m., stream enters river from W.; cross small stream from S.E. by covered bridge 8 yards long. Village. 6.6 m., cross stream from E. 7.1 m., Ching-K'ou-Chan, altitude 2670 feet. Just N. of the town there is a temple in a very fine clump of trees. 7.4 m., cross stream from E. 7.7 m., a large tributary comes in from the W. bounded on the S. by thickly wooded cliffs, which form a prominent bluff, covered with deep-green trees, overhanging the main river, which here flows through a dark and wooded gorge. The river is bounded on the E. by hills sloping 30°, cultivated at the bottom with Indian corn; on the top are wooded cliffs. 7.8 m., cross river by a stone bridge to left (W.) bank. 7.9 m., stream enters river from E. 8.5 m., cross stream from N.W. by covered wooden bridge; village. Hills 500 feet above river, sloping 20°, cultivated with Indian corn. 8.6 m., stream enters river from S.E. 9.1 m., village. 9.2 m., cross stream from W. 9.4 m., cross stream from W. Hills on W. 400 feet above river, sloping 20°; ridge on E. 200 feet above river, sloping 20°. 10 m., stream enters river from E. Hills on E. 500 feet above the river, sloping 20°; behind are mountains 2000 feet high, wooded and cultivated. 10.2 m., iron-rod suspension-bridge across river. 10.4 cross stream from W. 10.6 m., hills on both sides 500 to 800 feet above river. 10.9 m., stream enters river from S.E. 11 m., iron-rod suspension-bridge across river. 11.1 m., cross stream from N.W.; town of Huang-Ni-P'u, altitude 3725 feet. From Ching-K'ou-Chan to Huang-Ni-P'u, the hills bounding the valley are of red sandstone, much broken and undulating, nowhere more than 500 to 800 feet above the river; they mostly slope gently 15° to 20°, and are cultivated with Indian corn right up to their summits. There are patches of wood in clumps, and many trees. Behind the hills, on both sides of the river, mountains rise 1500 to 2000 feet; they are also well cultivated, and a good deal wooded, nowhere appearing very steep. The bottoms of the valleys are always laid out for rice, and the slopes for Indian corn. The road from Ching-K'ou-Chan to Huang-Ni-P'u is paved all the way with smooth, slippery stones, but it cannot be considered bad for a mountain road.

18th.—*Huang-Ni-P'u to Ch'ing-Ch'i-Hsien*.—At Huang-Ni-P'u hills to S. rise 600 feet, sloping 30°; behind are wooded mountains 2000 feet high. Road ascending river on left (N.) bank. .3 m., cross stream from N.W.; stream enters river from S.E. .9 m., cross stream from N.W. 1.2 m., cross stream



from N.W. by suspension-bridge; altitude 4132 feet. A valley runs up N.W. to a wooded mountain, 2000 feet high. Hill-sides all cultivated with Indian corn. Wooded hill to S., 1500 feet above river, sloping  $35^{\circ}$  to  $40^{\circ}$ . A very small bamboo here; this is the limit of bamboo. East of this point, hill-sides cultivated with Indian corn up to their summits; no cultivation westward. 1.5 m., altitude 4545 feet; road crosses river to right (S.) bank by iron-chain suspension-bridge 15 yards long, and ascends a tributary. The main river runs between wooded hills 1500 feet high, sloping  $50^{\circ}$ . Road crosses a ridge, wooded hills, sloping  $30^{\circ}$  to  $40^{\circ}$ , to 2 m., village of Hsiao-Kuan; altitude 4809 feet. Gate across road at summit of pass. 2.2 m., road regains right bank of river; cross stream from S. 2.3 m., stream enters river from N. 2.9 m., cross river to left (N.) bank by bridge of logs laid across; altitude 5123 feet; streams enter river from N. and N.W. 3 m., village. 3.2 m., cross stream from W., by bridge of logs laid across. Road zigzags up hill to 4.4 m., village of Ta-Kuan, at summit of pass; altitude 5754 feet. From Hsiao-Kuan to Ta-Kuan, wooded hills 1000 to 1500 feet above the valley, sloping  $45^{\circ}$  to  $60^{\circ}$ . 4.6 m., stream enters river from S. 5.5 m., stream enters river from S.E. 5.8 m., cross stream from N.W. 6 m., cross river to right (S.E.) bank. 6.2 m., from this point the rocks are a rotten, red granite, up to summit of Tai-Hsiang-Ling-Kuan. 6.7 m., cross river by wooden bridge to left bank; a very small patch of cultivation high up. 6.9 m., cross river by wooden bridge to right bank. 7 m., village; altitude 6973 feet. 7.5 m., cross stream from S.E. 7.7 m., stream enters river from N. 7.9 m., cross stream from S.E. 8.1 m., from Ta-Kuan to this point, mountains, wooded, and very green, 1000 to 2000 feet above the valley, sloping  $35^{\circ}$  to  $50^{\circ}$ ; no cultivation. 8.4 m., tea-house, altitude 8140 feet; stream enters rivers from W. Road zigzags up pass. 10 m., source of river; hills to N., 1000 feet high. 10.6 m., summit—Tai-Hsiang-Ling-Kuan, altitude 9366 feet. There is no more wood after crossing the summit, but very smooth grassy slopes. 10.9 m., tea-house, Ts'ao-Hsueh-P'ing. Road zigzags down pass on right bank of stream flowing S.W., to 12.2 m., village; altitude 7840 feet. A little tobacco in gardens, first cultivation. Wild bamboo and holly. Stream turns S. 12.8 m., stream enters river from E. First bean cultivation. 13 m., a cross-country road, without inns, leads to the W.; it joins the main road again, a little before I-T'ou-Ch'ang. 13.3 m., village; altitude 7187 feet. First Indian corn. 15 m., S.E. gate of Ch'ing-Ch'i-Hsien; altitude 5478 feet. Road from Huang-Ni-P'u to Ch'ing-Ch'i-Hsien, very bad. Rocks W. of summit to Ch'ing-Ch'i, limestone, and red sandstone; S. of Ch'ing-Ch'i, red clayey sandstone; red sandstone strata nearly horizontal. S. of Ch'ing-Ch'i the hills have no trees, but are all cultivated with Indian corn. Road to S.E. leading to Ning-Yuen-Fu.

19th.—*Ch'ing-Ch'i-Hsien to Fu-Hsing-Ch'ang*.—Leave Ch'ing-Ch'i by S.W. gate. 4 m., cross stream flowing S.E., altitude 5156 feet. 2.5 m., altitude 5842 feet. A road to S.E. 3.4 m., village. Slopes on W.,  $10^{\circ}$ ; beans and Indian corn. Slopes to S.  $10^{\circ}$ , covered with loose rocks; Indian corn. Road from Ch'ing-Ch'i to this village, very bad. Source of stream flowing S.W., on left of road. Road descends stream on right (W.) bank. 4.1 m., altitude 5202 feet. 4.7 m., first rice cultivation. 5.4 m., slopes on E.  $30^{\circ}$ , cultivated. 5.5 m., village with trees; scarcely any trees above this point. 5.9 m., cross stream from N. Road leaves stream, and crosses over a spur to river flowing S.E. 6.9 m., cross stream from S.E. Road ascends river on left (N.) bank. 7.4 m., cross stream from N. 7.5 m., town of Fu-Hsing-Ch'ang, altitude 3873 feet; river-bed 4 mile wide. To the S.W., steep hills 1000 feet high, sloping  $60^{\circ}$ ; to the N.W., hills 300 feet high, sloping  $15^{\circ}$  to  $30^{\circ}$ . Rice and Indian corn. Road between Ch'ing-Ch'i and Fu-Hsing-Ch'ang exceedingly bad; dangerous after rain.

20th.—*Fu-Hsing-Ch'ang* to *I-T'ou-Ch'ang*, ascending river on left (N.E.) bank.—6 m., cross stream from N.; village. Large tributary enters river from S.W. 1 m., hills to W., 600 feet high, sloping  $30^\circ$ , in very straight smooth slopes to the valley; Indian corn on slopes. To the N.E., hills 500 feet high, sloping  $15^\circ$  to  $20^\circ$ , and more broken with loose stones and rocks; Indian corn on slopes of hills; rice in flat river-bed. Soil, red clay. Mountains of red sandstone, striking E. and W.; dip  $40^\circ$  to S. 2.3 m., village. To the S.W., hills 1000 feet high, sloping  $30^\circ$ , in straight smooth slopes. To the N.E., hills 300 feet high, sloping  $15^\circ$ , broken with stones and rocks. 2.4 m., cross stream from N.E. 3.4 m., village; cross stream from N. 3.7 m., stream enters river from S.W.; village on right bank of river. Slopes of hills cultivated with Indian corn. 4.3 m., hills to N.E., more steep and broken; Indian corn cultivated up to the tops. Road in bed of the river, which is  $\frac{1}{4}$  mile broad and quite flat, and cultivated with rice. 4.4 m., hills to N.E., 200 feet high. 4.6 m., road leaves bed of river; village of Pan-Chiu-Ngai, altitude 4279 feet. Hills to N.E., 100 feet high, sloping  $10^\circ$ . Stream enters river from S.W. 5.1 m., cross stream from N.E.; stream enters river from S.W.; 6.2 m., cross stream from N.E.; stream enters river from S.W. Valley running S.W. to a wooded mountain, 4 miles distant. Hills to the W.S.W., 1000 feet high, sloping  $30^\circ$ , cultivated with Indian corn up to the tops. Hills to the N., 300 feet high, sloping  $15^\circ$ , much broken, and cut up by ravines, cultivated with Indian corn; rice in the valley. 6.8 m., a cross-country road, from N.E. of Ch'ing-Ch'i-Hsien, here joins the main road; cross stream from N.E. 7.2 m., village. Mountains to S.W., 1000 feet high, sloping  $30^\circ$ ; cultivated with Indian corn to the tops. Hills to N.E., 500 feet high. Hence to I-T'ou-Ch'ang the valley is more open, there are a great many trees in clumps, and a large number of the wax-insect tree. 7.3 m., cross stream from N.E. 8 m., stream enters river from W.S.W.; village on right bank of river. Mountain to S.W., 1000 feet high, sloping  $20^\circ$ , cultivated with Indian corn to the top; a good many trees in clumps. Rice in the valley. 8.5 m., hills to N.E., 200 to 300 feet high, sloping  $5^\circ$  to  $15^\circ$ , much broken. 9.5 m., cross stream from N.N.E., by stone bridge of one arch. Spurs, sloping  $10^\circ$ , from the mountain to the N.E., which is 1500 feet high. 10 m., town of I-T'ou-Ch'ang; altitude 4882 feet. Stream enters river from S.W. To the N.E., low spurs much broken, sloping  $5^\circ$ ; to the N., hills 1000 feet high. Hills to W., 1000 feet high, sloping  $30^\circ$ . Indian corn nearly to the top; more wood than farther E. A wooded mountain 4 miles to S.W. The tops of the mountains are wooded. Road from Fu-Hsing-Ch'ang to I-T'ou-Ch'ang is very fair, but has one or two bad places. Hills on N.E. of valley generally 300 feet high; on S.W. 1000 feet. The rocks are of red sandstone; in the neighbourhood of I-T'ou-Ch'ang they are more yellow. Rocks strike nearly E. and W., dip  $40^\circ$ . A little limestone near I-T'ou-Ch'ang.

21st.—*I-T'ou-Ch'ang* to *Hua-Lin-P'ing*, ascending river on left (N.) bank.—1.2 m., river runs through a precipitous gorge for  $1\frac{1}{2}$  m.; road zigzags to the top of the spur above the river, and is continued at 200 feet above it. 1.4 m., cross large tributary from N.N.E. by stone bridge. 2 m., cross stream from N.E. 2.2 m., a mountain to S.W., 1000 feet above the river, sloping  $30^\circ$ , cultivated with Indian corn nearly to the top, which is more steep and wooded. To the N.E., a slope of  $5^\circ$  up to a hill 1000 feet above the river; nearly all Indian corn, a very little oats and buckwheat, and a few patches of wood. Bamboo in the valley below. 2.5 m., cross stream from N.N.E. 2.9 m., cross stream from N.N.E. 3.3 m., road descends to river. 3.6 m., village of Kao-Ch'iao, altitude 6002 feet; cross stream from N.N.E. 4 m., cross stream from N.N.E., by stone bridge. 4.2 m., stream enters river from S.E. Upper slopes of mountains to the S. are all wooded; lower slopes, Indian corn. Hills slope down to river,  $20^\circ$  to  $30^\circ$ . Gentle slope down to river on the N.,  $10^\circ$  to



15°; a good deal broken. Road hence to 6 m., on spurs of hills above river. 5 m., stream enters river from N.E. 5.5 m., San-Ch'iao-Ch'eng, altitude 5830 feet; cross stream from N.E. by covered bridge. There is coal in the mountains here. Rocks, red-yellow sandstone. Road from I-T'ou-Ch'ang, very good; red sandstone. 5.9 m., village; large tributary enters river from W.S.W. Road descends to river. 6.2 m., cross stream from N.E.; village with bamboo, altitude 5853 feet. River between steep hills 1000 feet high; half cultivated, half low scrub. 6.9 m., village. 7.3 m., cross stream from N. 7.6 m., stream enters river from N. Hills to S.W., 300 feet above river; hills to S.E., 600 feet above river, partly cultivated; a great deal of low jungle, few large trees. Cross river to right bank, and almost immediately recross to left bank. 8 m., village, altitude 6629 feet. Hence to summit of pass—Wu-Yai-Ling—the road is close to the stream, very steep and very bad. Steep hills on both sides, covered with green underwood. Rocks, red sandstone. 8.4 m., cross river to right (S.W.) bank. 8.9 m., cross river to left bank; village. Hills sloping 50°, 300 feet above the stream; little cultivation, dense green jungle. 9.3 m., cross river to right bank; a small patch of buckwheat. 9.8 m., cross river to left bank. 10.3 m., village, near source of river; altitude, 7850 feet. Road zigzags up to 10.9 m., summit of pass, Wu-Yai-Ling, or Fei-Yueh-Ling, altitude 9022 feet. 11.1 m., cross stream, flowing N.E. Road descends river on left (W.) bank, in a valley closed by hills, covered with low green jungle. 11.2 m., stream enters river from E. 11.3 m., altitude 8055 feet. 11.5 m., cross stream from W. 11.7 m., village, altitude 7730 feet; granite pebbles in bed of stream. 11.9 m., stream enters river from S.E. 12.2 m., Hua-Lin-P'ing, altitude 7073 feet. Hills to N. 1000 feet high, sloping 30°, yellow sandstone, dip 40°, cultivated with Indian corn, partly low jungle, very green.

22nd.—*Hua-Lin-Ping* to *Leng-Chi*, descending river on left (S.W.) bank. —2 m., cross stream from S.W. 3 m., cross stream from S.W. by covered wooden bridge; altitude 6805 feet. South of river, limestone rocks, friable and slaty, strike N.E. and S.W. Mountain 1000 feet high, sides covered with Indian corn and low jungle. 4 m., cross stream from S.W. 8 m., cross stream from S.W. by spar bridge, 10 yards long; village, altitude 6107 feet. A few insect-trees. 1 m., cross stream from S.W., altitude 6095 feet. 1.1 m., cross stream from S.W. 1.3 m., altitude 6132 feet; road 500 feet above river. 1.7 m., altitude 5472 feet. 2 m., village at river-level, altitude 5107 feet; stream enters river from E. On the N. are limestone mountains 1500 feet high, slope 30°; Indian corn nearly to the top, no wood, all green. 2.2 m., village at river-level; bed of river narrow. Mountains to S. sloping 50°, little cultivation on them. 2.4 m., cross stream from S.; village. Road 200 feet above river. 2.9 m., houses; first rice cultivation. River separates into two branches. 3.3 m., altitude 4976 feet. 3.8 m., a large village with many trees and bamboos. On the S. are limestone mountains 1500 feet high, sloping 30°; Indian corn nearly to the top. Road, which has been W., suddenly bends to N., and ascends the Tung-Ho or Ta-Ho (that joins the Ya-Ho at Kia-Ting-Fu) on its left (E.) bank. 4 m., cross the two branches of tributary that road has been following by a spar bridge. 5 m., cross stream from E. 5.2 m., *Leng-Chi*, altitude 4633 feet. River is here 40 yards wide. To the S. cultivated hills 1000 feet high, sloping 30°; pine-forests at top. Limestone rock striking E. and W., vertical. To the W., mountains 1500 feet high, wooded at the top.

23rd.—*Leng-Chi* to *Lu-Ting-Ch'iao*, ascending the Tung-Ho on left (E.) bank. —4 m. cross stream from N.E. 1.5 m., stream enters river from S.W. Road 500 feet, above the river. At the mouths of the streams, a small flat plain generally projects into the river. 2.6 m., village. Ridge 2000 feet high, 2 miles from right bank, continues N. about 5 miles. 3.1 m., village between

road and river. To the E. are grassy spurs rounded at the top. Cultivation below road, which is 200 feet above river. To the W. very little cultivation on slopes; no wood on tops of mountains. 3.7 m., stream enters river from W. 4.1 m., village. 4.2 m., cross stream from E. 5.2 m., village. Road at foot of spur, with slopes  $15^{\circ}$  above it. Between road and river a slope of  $40^{\circ}$ . Road 500 feet above river. Very little cultivation above the road, all cultivated below it. To the E., spurs much broken. To the W. cultivation in patches; hills sloping  $30^{\circ}$ . 5.6 m., stream enters river from W. 5.9 m., road 500 feet above river. Rice in the plain below. 6.4 m., village; cross stream flowing W., afterwards S.W. 6.6 m., Indian-corn cultivation, a long way above road. 6.8 m., cross stream from E. 7.1 m., stream enters river from W. 7.5 m., limestone rocks, strike N.E.-S.W. 7.8 m., village on right bank of river. 8 m., village. 8.1 m., stream enters river from W. 8.3 m., village; a few bamboo and insect-trees. Road at river-level. Cross stream from E.S.E. 9 m., village. 11 m., town of Lu-Ting-Ch'iao, on both banks of river; altitude 4640 feet. Cross river to right (W.) bank, by iron-chain suspension-bridge 100 yards long. Stream enters river from E. Mountains on both sides of river, 2000 to 3000 feet high, those on the W. throwing out long spurs, grassy slopes  $40^{\circ}$ , a little cultivation and a very little wood. Road between Lêng-Chi and this town is very good.

24th.—*Lu-Ting-Ch'iao to Wa-Ssü-Kou*, ascending the Tung-Ho on right (W.) bank.—5 m., village on left bank of river. 8 m., village; precipices 80 feet high. 1.1 m., mountains on W., precipitous. 1.4 m., a rocky, precipitous point on W. bank of river. 1.8 m., village; a little rice, but very little cultivation to the W., grassy slopes  $40^{\circ}$ . To the E. no cultivation at all. 2.2 m., road rises 400 feet above the river, runs along a smooth slope  $50^{\circ}$  down to river; no cultivation. Mountain 2000 feet high to E., sloping  $40^{\circ}$ , wooded at top; no cultivation. 2.5 m., stream enters river from N.E. 3.2 m., road passes through a gate, and begins to descend. 3.5 m., cross stream from S.W.; villages on both sides of stream, with bamboo. Valley leading S.W. to wooded peak 2000 feet high. Road  $\frac{1}{2}$  mile from river, and 200 feet above it. Rice and sago in valley. 4 m., town at foot of spur from a mountain 2000 feet high with smooth sides, and patches of cultivation. 4.2 m., road at rocky point 500 feet above river. Mountain 2000 feet high, to E., wooded at top and throwing out spurs to river. 4.9 m., road 500 feet above river. 5 m., first village of the aborigines, on left bank of river. 5.2 m., stream enters river from N.E. Mountain bearing E. sloping  $50^{\circ}$  right down to river. Mountains W. of road, 2000 feet high. Road begins to descend to river. 5.7 m., road at river-level. Rocky and precipitous point on W. bank. Long, smooth slopes on left bank, from a ridge to the E. 2000 feet high. 6 m., Hsiao-P'êng-Pa, altitude 4653 feet. Mountains on both sides, steep and broken. To the N. of Hsiao-P'êng-Pa there is a good deal of steep up-and-down road, and sharp corners. 6.4 m., and 6.6 m., precipitous points on W. bank of river. 6.8 m., cross stream from S.W.; village. 7.3 m., cross stream from W. 7.4 m., stream enters river from N.E. 8.5 m., village. 8.7 m., mountains to N. and S. with very regular sides, that to N. 2000 feet high, sloping  $40^{\circ}$ . Road commences to ascend above the river. 9.2 m., road 300 ft. above the river. 9.6 m., cross stream from S.W. Road 500 feet above the river; below the road the mountain slopes  $40^{\circ}$  down to river. 10.2 m., village; precipitous and rugged hills on both sides of river. 10.5 m., cross stream from S.W. by covered bridge. Valley to S.W. leading up to snow mountain about 8 miles distant. 11 m., slopes to N. very precipitous, running straight down to river. Peak, bearing S., 3000 feet high, and wooded. Peak, bearing E., 4000 feet high, well wooded. 11.3 m., flat,  $\frac{1}{4}$  mile wide, S.E. of road at foot of slope, between it and the river. Stream enters river from E. Road crosses spur of hills to avoid bend of river, where a large tributary enters from N.N.W. 12.5 m., Wa-Ssü-Kou,



altitude 4933 feet. Very little cultivation, mountain sides steep and precipitous; a little rice.

25th.—*Wa-Ssü-Kou to Ta-Chien-Lu*, ascending tributary of Tung-Ho on right (s.) bank.—5 m., mountain sides to s. partly cultivated; the rest, low, green jungle, with pines at the top. 8 m., stream enters river from s. Hills to s., precipitous. 1.4 m., cross stream from s. 2.2 m., cross stream from s. 2.7 m., cross stream from s.s.w. 2.9 m., precipitous mountain to s. 3.7 m., stream enters river from n.e. 4 m., mountain 1000 feet high to s. sloping 60°, wooded at the top, grass sides of low undergrowth. Road 200 feet above river. Precipitous mountain to s., 1000 feet high, wooded at the top. 4.1 m., precipitous hills s. of river, 300 feet high. 4.6 m., tea-house. 4.7 m., cross stream from s. 4.8 m., village. 5.1 m., a precipice, nearly vertical, 300 feet high, s. bank of river. 5.3 m., village; cross stream from s.w. 5.5 m., steep slopes to s., 1500 feet high, broken with precipices; no cultivation. 6 m., stream enters river from n.e. 6.1 m., Liu-Yang, altitude 6570 feet. Mountain to s. 1500 feet high. From *Wa-Ssü-Kou to Liu-Yang*, the road is rather bad; but in places there are remains of a very old, fine, broad, paved road, with easy gradients. 6.5 m., stream enters river from s. 8.1 m., cross stream from s.e. Grassy slopes, 60° on both sides. Mountain on s. 1500 feet high. 8.5 m., stream enters river from n.w. 9.1 m., cross stream from s. Mountains on s. 1500 feet high; slopes on both sides of river 40°. 9.6 m., stream enters river from n.w. 9.8 m., pilo. 11.2 m., *Ta-Chien-Lu*, altitude 8346 feet. Road from *Liu-Yang to Ta-Chien-Lu*, very good.

7th August.—*Ta-Chien-Lu to Cheh-Toh*, ascending river.—Cross river on s. of *Ta-Chien-Lu*, to left (w.) bank by one-arch stone bridge. Stream enters river from e. 4 m., Lamassery. Hills about 1000 feet above river, sloping 45°; few trees, no cultivation. Round Lamassery and in bottom of valley, oats and barley. 7 m., cross stream from w.s.w. Palace of old king. Hills on right bank, 1000 feet above river, sloping 60°. 1.8 m., slopes on both sides 30° down to river, covered with green underwood. 2.2 m., cross stream from w.; hills 1000 feet high on each side; road 200 feet above river. 2.7 m., stream enters river from s. A road to s.e., leading to *Kien-Chang*. Snowy mount (*Ruh-Ching*) to s. 3.1 m., cross stream from n.w. 3.6 m. broken slopes of 45° down to river on both sides, covered with green underwood, but rocky in places. 4.5 m., hills steep and broken on both sides. 4.8 m., precipice on right bank, 100 feet high. 5 m., cross river to right (s.) bank by wooden bridge; hills rocky. 5.3 m., cross stream from s.s.w.; slopes 40° on both sides. 5.8 m., hills on both sides, 200 to 300 feet high, sloping 20° to 30° down to river, higher ones behind covered with green underwood. 6.4 m., cross river to left (n.) bank by wooden bridge. Valley more open and undulating. 6.9 m., stream enters river from s. 7.2 m., *Cheh-Toh*, altitude 10,838 feet. Cultivation in valley. Low hills to s. 200 feet high, sloping 20°, green. Stream enters river from s.w. Road from *Ta-Chien-Lu to Cheh-Toh* very fair.

8th.—*Cheh-Toh to An-Niang*, ascending river to *Cheh-Toh-Shan*.—A sharp, bare, craggy ridge, 1500 feet high, sloping 50°, on right bank, commences here and runs w. and w.n.w. It is bare at the top, but green below. 1.6 m., cross stream from s. 2.3 m., cross stream from n.n.e. Brushwood hills to s. 1000 feet high, sloping 30°, bare crags at top. To s., low slopes 15° down to river; rocks and shrubs. 3.1 m., slopes on both sides 25° down to river, bare at top. Those to s. have a few fir-trees half-way up. Lower slopes to s. covered with grass and green brushwood. 4 m., cross stream from n.n.e. Lakes behind the mountains to the s. 5.7 m., cross river by bridge, to right (s.) bank. 6.6 m., cross stream from s.w. A bed of slaty shale crops up here on left bank, striking n.e. and s.w., dip 10° to s.w. 8 m., slopes on both sides, 10° down to river, 500 feet high. 9.2 m., summit of pass—*Cheh-Toh-Shan*

(the "Jeddo" of Cooper), altitude 14,515 feet. Source of river. The crags to s. are about 200 feet higher. To the n. a gentle slope about 100 feet. The rocks are granite below, and limestone above, strike n.e., dip 60° to e. The ridge here forms a basin enclosing a little valley, running up to n.s.e., with steep, bare crags of limestone. Road from Cheh-Toh to this point, very good; and hence to An-Niang, exceedingly good. 9.4 m., source of river; road descends on left (s.) bank. 10.1 m., cross stream from s., flowing through wide open valley. 10.5 m., stream enters river from n.s.e. From this point to 14.4 m., there are hills on both sides, 1000 to 1500 feet high, sloping 30° down to river, but at bottom no more than 10°, with grass. 12.2 m., Ti-Zu or Hsin-Tien-Chan; altitude 13,335 feet. Hot springs. 14 m., first cultivation; altitude 13,131 feet. 14.5 m., cross stream from s.s.w. From this stream to beyond An-Niang, on s. of road are rounded grassy hills, about 200 feet high, sloping 15° down to river, without any valley cutting through. 16.8 m., village of Nah-Shi, on right bank of river. 17.2 m., stream enters river from n.e. To the n. are grassy hills with round tops, 700 feet high, sloping 15° down to river, extending to An-Niang. 19.2 m., stream enters river from n. 20.5 m., stream enters river from n.s.w. 21.2 m., stream enters river from n.s.w. 21.6 m., An-Niang, or Ngan-Niang-Pa; altitude 12,413 feet. Very flat valley  $\frac{1}{4}$  of mile wide. The valley the whole way from the summit w. to An-Niang is magnificent. An open valley enclosed by hills, nowhere very steep, but gradually getting more gentle at the bottom. The sides of the hills, and the valley, covered with grass. Magnificent pasture; many wild flowers. From Nah-Shi to An-Niang, there are Tibetan houses on right bank of stream, about  $\frac{1}{4}$  or  $\frac{1}{2}$  mile apart.

9th.—*An-Niang to Ngoloh*, descending river on left (s.e.) bank.—1 m., valley called Goh-Gi on right bank running up to n.; in the distance a snowy mountain called Cho-Ri-Ka, bearing n. A stream flows down this valley, but before entering the river it turns to the s.w., and runs parallel with it for about 2 miles, forming a long, flat spit of land elevated about 20 feet above the river, on which houses are built, 300 or 400 yards apart. 1.4 m., temple near right bank of stream (Goh-Gi), on slope 50 feet above river. Hills to n. 500 feet high, sloping 50° down to river. 1.9 m., cross stream from s.e.; valley with a few fir-trees on top of hill. 2.8 m., stream (Goh-Gi) enters river on n. bank. 3.9 m., cross stream from s.e. House, with a few trees. Hills to n. 300 or 400 feet high, sloping 20°, a little broken. 4.4 m., stream enters river from n.w. Precipice to n., 100 feet high. Wide open valley, with road to n.w. 4.5 m., village of Tung-Che-Ka. Hills to s. 400 feet high, sloping 30°, broken. 4.8 m., grassy hills on right bank, 400 feet high, sloping 20° down to river. 5.2 m., cross river to right (n.w.) bank, by spar bridge, 10 yards long. 6.5 m., village. River turns s.e. down valley leading to snow mountain (Kung-Ka), 15 to 25 miles distant. Road ascends left (n.e.) bank of a tributary which enters river at this point, in a valley 800 yards wide. Hills on both sides, 500 feet high, with grassy slopes 30° down to river. Old fort on point of spur in fork of rivers. 7.6 m., fir-wood on top of hills to s. 8.1 m., cross stream from n. Valley of main stream opens out to 1 mile wide. 8.6 m., stream enters river from s.w. Grassy hills on both sides, 400 to 500 feet high, sloping 20°. 9.1 m., cross river to right (w.) bank by spar bridge 10 yards long. Village of about 12 scattered houses. 9.2 m., cross stream from w. by spar bridge. 9.6 m., hills on right bank, 400 feet high, sloping 30°, with a few broken, rocky crags. 9.9 m., cross stream from w.; along which a road leads to La-Li-Sheh. Hills on left bank rather precipitous at bottom. 10.2 m., cross stream from w. 10.7 m., stream enters river from n.e. Valley of main stream 1 mile wide. Hills on right side, 300 feet high, sloping 30° down to river. Hills on left bank, a little bare in places, sloping 50° down to river. 11 m., stream enters river from n.s.e. 11.4 m., Ngoloh, altitude



12,027 feet; a village nearly all Chinese, and called by them "Tung-Golo." (This is the "Tung-Oola" of Cooper.)

11th.—*Ngoloh to Wu-Rum-Shih*.—1 m., hills on both sides of river, 400 feet high, sloping  $20^{\circ}$ ; all grass. 1.2 m., cross stream from s. 1.5 m., stream enters river from s. 1.8 m., hills on right bank, 300 to 400 ft. high, sloping  $30^{\circ}$  down to river, commence to be wooded. 2.3 m., cross stream from s. Main valley 100 yards wide. Valley to the s. wooded with firs. Hills to n., 300 to 500 feet high, sloping  $30^{\circ}$ ; all grass. 2.5 m., cross stream from s.; a few houses at its mouth. 3 m., hills to s. sloping  $40^{\circ}$  down to river. Rocks broken, with shrubs and grass. Valley 50 yards wide. 3.6 m., about the end of cultivation. Slaty rocks crop out, strike N.E. and S.W.; nearly vertical. Hills to n. slope  $30^{\circ}$  down to river. Valley 20 yards wide. Stream enters river from N.W. 3.8 m., altitude 12,377 feet. 4.1 m., fir-trees, and a great deal of shrub like azalea. 4.4 m., cross stream to left (N.W.) bank, by bridge. 4.6 m., altitude 12,903 feet. Road begins to ascend rapidly to S.W. Valley 20 yards wide. Splendid turf hills sloping  $30^{\circ}$  down to river. 5.3 m., La-Tza (Tibetan) or Shan-Kên-Tzû (Chinese) (both names mean "Root of the Mountain"), altitude 13,040 feet. Only 1 house. Stream enters river from S.E. Cross stream from W. 5.6 m., road 200 feet above stream. Hills on left of road sloping  $40^{\circ}$  or  $50^{\circ}$  down to river, with fir-trees and shrubs; on right of road rounded hills  $40^{\circ}$  or  $50^{\circ}$ , covered with shrub like azalea. 5.8 m., source of river. 6.3 m., summit, Ka-Ji-La (Tibetan) or Ko-Urh-Shi-Shan (Chinese), altitude 14,454 feet. Snow pyramid Ja-Ra (King of Mountains) bears  $40^{\circ}$ . The Ja-Ra ridge appears to run about N.W. or N.N.W. To go to this from Ta-Chien-Lu, the road leaves by the N. or H. (?) gate—1 day's journey. Road from La-Tza to Ka-Ji-La is very steep, rising 1400 feet in 1 mile. 6.6 m., cross stream flowing S.E., altitude 14,400 feet. Road descending 50 feet from summit to this stream. 7.5 m., altitude 14,430 feet. Road ascends 30 feet from stream,  $\frac{1}{2}$  mile E. to this point, then descends again, and ascends to summit Do-Kû-La-Tza. 7.9 m., cross upper part of same stream as at 6.6 m., here flowing N. 8.2 m., summit, Do-Kû-La-Tza, altitude 14,597 feet. From Ka-Ji-La to this point is a beautiful undulating plateau, covered with the richest grass and buttercups. This plateau seems to extend a long way N. and S. In places slaty rocks crop out, striking E. and W. Mount Kung-Ka (seen from between An-Niang and Ngoloh) bears  $135^{\circ}$  from this place. A tributary of the Ya-Lung-Chiang rises 1 mile to the S.; road descends right (N.) bank. 9.7 m., altitude 13,800 feet. From Do-Kû-La-Tza to this point, the road descends by a steep zigzag over loose sharp stones. Valley of the river enclosed on both sides by hills sloping  $50^{\circ}$ , covered with firs and laurels; tops all grass. 11.1 m., cross stream from N.W. Mount Chein-Mieh-Goung bears  $242^{\circ}$ ; no snow on it, but round, grassy top. 11.9 m., stream enters river from S.E. 12.1 m., a few firs on hill-side on right of road, nearly covered with a plant like azalea. 12.4 m., cross stream from N.W. 12.9 m., pine-forests begin again, on both sides of river. 13.1 m., first cultivation; altitude 13,327 feet. 13.6 m., stream enters river from E.S.E. Hills on right bank sloping  $35^{\circ}$  down to river; shrubs, holly, and a few firs. Hills on left bank, sloping  $35^{\circ}$ ; firs, willows, and a tree that looks like birch. 14 m., Wu-Rum-Shih or Wu-Ru-Chung-Ku, altitude 12,048 feet. Hills on both sides 500 feet high; those on left bank sloping  $30^{\circ}$ , with fir and other trees; those on right bank sloping  $35^{\circ}$ , broken and rocky, with shrubs like azalea. Valley 100 yards wide.

12th.—*Wu-Rum-Shih to Ho-Kou or Nia-Chû-Ka*, descending river.—4 m., cross stream from N.W.; stream enters river from S.E. 1 m., stream enters river from s. 1.2 m., dense pine-forest to s.; rocky, precipitous, broken slopes, with a few pines, walnuts and peaches to N. 1.3 m., cross stream from N.N.W. 1.6 m., ruins; cross stream from N.N.W. 2 m., cross stream from N.

2.5 m., stream enters river from s., in a valley sloping 40° both sides down to stream; all fir. Main valley, hills 600 to 700 feet high sloping 35°; all pine-forests. 2.8 m., cross stream from n. Hills 600 to 700 feet high, sloping 35°; fir and low brushwood. 3.2 m., house on left bank of river. 3.4 m., stream enters river from s. 3.7 m., cross river to left (s.) bank by bridge. 3.9 m., hills on left bank sloping 40° down to river, covered with firs and a shrub like azalea. Wild cherries, peaches, a few currants and gooseberries. Trees like birch, 2 kinds of barberries in the valley. Hills on right covered with pine and shrub like azalea. 4 m., cross stream from s.w. 4.4 m., house. 4.9 m., streams enter river from E.N.E. and N.N.E.; cross stream from s.w. Hills on left bank 300 to 400 feet high, sloping 20°; fir, and a shrub like azalea. 5.4 m., Lamassery, Pan-Mu-Re,  $\frac{1}{4}$  mile from right bank of river. Hills on both sides 500 feet high, sloping 20°; those to n. covered with pines and shrubs; on s. all fir. 5.8 m., cross stream from s.w. 6 m., houses; cross stream from s.w. 6.8 m., hills on both sides 500 feet high, those on left bank sloping 25°, with pine, and a shrub like azalea; those on right bank sloping 20° down to river, with pines only. 7 m., cross stream from s.w.; stream enters river from N.E. 7.1 m., house. 7.5 m., cross stream from s.w. 8.6 m., cross stream from s.w.; stream enters river from N.E. Hills to n. sloping 25° to 30° down to river; firs and some shrub like azalea. Hills to s. sloping 15° to 20° down to river; firs and same shrub. 8.9 m., houses. 9.2 m., cross stream from s.w. 9.3 m., cross stream from s.w. 9.4 m., cross stream from s.w. 10 m., Ker-Rim-Bu (The Octagon Tower) or Pa-Ko-Lo, on a spur, altitude 10,435 feet; about 6 houses. 10.2 m., cross stream from s. 11 m., hills on both sides 500 feet high; those to n. sloping 50°, with pines at top, shrub like azalea below, rocky in places; those to s. sloping 30°, with pines and birch. Many walnuts in the valley, also wild peaches, plums, apricots and barberries. 11.1 m., stream enters river from n. 11.6 m., cross stream from s.e. 12 m., stream enters river from n., in a small valley which does not go through the ridge that commences here, and slopes 70° down to river, 500 feet; same shrub. 12.5 m., cross stream from s.e. River enters a gorge where hills slope down almost precipitously to water's edge. 13.3 m., cross river to right (n.) bank by spar bridge (new). 13.5 m., stream enters river from s.e. 14 m., hills on both sides 500 feet high sloping 70° down to river, with rocks and shrubs; and firs on s. bank. Cross large stream from N.E. by a new spar bridge. 15.4 m., stream enters river from s.e. 15.6 m., cross stream from n.w. 15.8 m., cross river to left (s.e.) bank by spar bridge. Hills on both sides about 600 feet high sloping 50° down to river, covered with shrubs and firs on s. bank. 16.2 m., cross river to right (n.) bank. Point of bare rock to n.; hills 500 feet high, rocky and precipitous, covered with low shrub. Hills to s. slope 70°. 16.4 m., stream enters river from s. 17.9 m., hills to s. about 500 feet high, rocky and precipitous; low shrubs and bare rock. 18.2 m., cross river to left (s.) bank by spar bridge with one pile in the middle; immediately after this, a waterfall close to the road. 18.3 m., cross stream from s.e. 18.8 m., Ho-K'ou or Nia-Chū-Ka, altitude 9222 feet. The tributary we have been descending here discharges itself into the Ya-Lung-Chiang (Chinese) or Nia-Chū (Tibetan) river, which is from 50 to 120 yards broad, and flows s. A precipitous and rocky crag intervenes between the Ya-Lung-Chiang and the tributary, on right (n.) bank of the latter; this crag is 700 feet high; strata e. and w. nearly vertical, limestone and sandstone. South of Ho-K'ou, hills 800 feet high, sloping 70°, with pines at top, shrubs and grass below. West of Ho-K'ou and s. of stream, hills 800 feet high, sloping 70°; pines at top.

13th.—Ho-K'ou or Nia-Chū-Ka to Ma-Geh-Chung.—Cross Ya-Lung-Chiang by ferry to some houses—Peh-Da-Chung—on opposite (right) bank, about 100 feet above the level of the water. Ascend hills, 500 feet high, sloping



40°, pines at top, grass and scrub-oak below, on right (s.) bank of a stream which here enters the Ya-Lung-Chiang, by a rocky path 200 feet above it. .5 m., cross river to left (s.) bank. Peaches and barberries in the valley. 1.1 m., cross stream from n. Hills on both sides 500 feet high, sloping 40°; pines everywhere on s. side; on n. side pines at top, grass and scrub-oak with a few pines below. 1.6 m., cross the main stream, which flows from w.n.w., by a spar bridge, and ascend left (w.) bank of a tributary. 2 m., cross stream to right (z.) bank, by spar bridge. 2.9 m., cross stream to left (n.w.) bank by spar bridge. Hills to n. 600 feet high, sloping 60°; dense pine-forest. 4.1 m., cross stream from n.w. Hills on both sides 500 feet high sloping 60°; dense pine-forest. Rocks, sandstone, slaty-rocks, and shale, strata vertical, striking E. and W. From Ho-K'ou up to this point, road over sharp stones and rocks through forest of pine and other trees which completely obstructed the view. Cherries, peaches, and barberries in great quantities. 4.4 m., road gets a little better. 4.7 m., cross stream from n.w. Rocky crags to s., 800 feet high, sloping 60° to 70° down to river, with pines. 5.1 m., cross stream from n.w.; stream enters river from s. A grassy-topped hill to n. 5.4 m., cross stream from n.w.; stream enters river from s. An opening to n.w. called Shin-Ka. Hills on n. 300 to 400 feet high sloping 15° to 20°, nearly all covered with dwarf oak and a few pines. Hills to s. 500 feet high, sloping 60°, with broken crags and rocks showing through; pine-forest. From Ho-K'ou up to this point, the stream has run between hills sloping sheer down to it, leaving no flat ground whatever. The valley now opens out a little; a little wheat and barley. 6.3 m., cross stream from n.w.; hut. 7 m., Ma-Geh-Chung, altitude 11,971 feet; streams enter river from n.w. and s.e. Valley to w., hills 300 feet high, sloping 20°; chiefly oak-scrub. A valley to s.e., sides slope 60°, covered with pines, some at the top quite dead.

14th.—*Ma-Geh-Chung to Li'ang-Ngoih*, ascending stream to Ra-Ma-La on left (s.) bank.—4 m., hills to n., 300 feet high, sloping 30°; grass and shrubs. Hills to s., 300 feet high, sloping 30°; pines. A little cultivation in the valley. .5 m., stream enters river from s. .9 m., cross stream from n. 1.2 m., the road, which is 100 feet above the stream, runs along a grassy plateau 40 yards wide. This plateau extends 1 mile to s.w. On the right, to n.w., hills rise 200 feet above it, with a slope of 35°, covered with oak and grass; rocks crop out. Hills to s. 300 feet high, sloping 20°; pines. 1.3 m., stream enters river from s. Valley to s., with grassy slopes of 20°, 200 feet high; pines. 1.8 m., stream enters river from s.s.w. Hills to n., 200 feet high, sloping 20°; oak. Valley up to n., covered with oak. 2.3 m., altitude 12,815 feet. Road at level of stream through thick woods. 2.7 m., cross stream from n. Hills to s., 300 feet high, sloping 20°; covered with pines. Dense oak jungle to the n. Road from Ma-Geh-Chung to this point, very fair. It now begins to be very stony. 2.9 m., stream enters river from s. Hills to s., 200 feet high, sloping 20°; pines, and grass at top. 3.2 m., cross stream, from n.n.e. Pines and oaks leading up to grassy tops on the s. Dense oak jungle on the n. Road better. 3.6 m., cross stream from n.n.e. Hills on both sides, 150 feet high, sloping 20°; oaks (on n. only), pines below, grass at top. Valley to n., leading up to grassy hill. 4 m., cross stream from n. Hills on both sides, 150 to 200 feet high, sloping 20°; a few pines and oaks below, grass at top. A small valley to n., like a basin. 4.6 m., altitude 14,413 feet. Above the pines and oaks. Source of the stream that road has followed. 5 m., Mt. Ra-Ma-La, first summit, altitude 14,915 feet. 5.6 m., La-Ni-Ba (hollow between mountains), altitude 14,335 feet. Source of stream flowing w.n.w., on right of road, in a valley, with pines in the hollow, grass above. Road w. of La-Ni-Ba passes over an undulating ridge of grass and wild-flowers, many rhododendrons,

splendid grazing ground; it ascends for 2 miles to 7.6 m., second summit of Mt. Ra-Ma-La, altitude 15,110 feet. Rocks, quartz and sandstone striking e. and w., also a good deal of slaty shale. Road now goes along a grassy ridge to w., descending gradually. 8.6 m., road to s.w. leading to Lamassery. Source of stream flowing to n.w. 9.6 m., source of stream flowing s., in a valley, with pines in the hollow and grass above. 10.6 m., hill to s., 50 feet high, sloping 5°; grass. 11.1 m., Mu-Lung-Gung or P'u-Lang-Kung (Chinese), 2 huts. Source of stream flowing s., in a valley, with pines in the hollow, grass at top. Shale and slaty rocks striking w.n.w. Road bears 287°, to where it ascends to the w., about 2 miles beyond Lit'ang-Ngoloh. 11.6 m., road descends side of valley through a pine-forest. 12.1 m., altitude 13,833 feet. 12.8 m., steep zigzag over loose rough stones down to bottom; road very bad. 13.6 m., bottom of zigzag, altitude 12,384 feet. Cross stream from n.e., which runs into river on left of road, flowing s.e. and s. Road ascends river on left (n.) bank. 14.2 m., cross stream from n. Hills on left of river, 100 feet, and on right of river, 200 feet high, sloping 20°; grass and pines. Valley, 200 yards broad; nearly all grass, a little cultivation. 14.6 m., Lit'ang-Ngoloh (Shih-Wolo in Chinese), altitude 12,451 feet. Stream flows through it from n. Hills on both sides, 200 feet high, sloping 20°; grass and pines. Fields in valley divided by hedges and fences.

16th.—*Lit'ang-Ngoloh to Ho-Chü-Ka*.—Road ascends left (n.) bank of river. .6 m., stream enters river from s.; cross river to right (s.) bank; village. Black slaty shale striking e. and w. Sandstone and clay surface; grassy slopes. .9 m., stream enters river from n. 1.1 m., road leaves river, which turns n.w. 1.9 m., source of a stream on right of road flowing e. Source of a stream on left of road flowing s. Park-like undulations, patches of pine, rich grass, oak scrub. (Saw a musk deer.) 2.6 m., source of a stream on left of road, flowing e. and afterwards s. 3 m., Niu-Chang, altitude 13,900 feet. Streams rise on each side of road, and flow, one e.n.e., the other s.s.e. In every direction rounded and grass-topped hills, wooded hollows. 3.5 m., summit—Tang-Gola, altitude 14,109 feet. Mu-Lung-Gung bears 105°. Streams rise on both sides of road, and flow one n.e., the other s. 3.6 m., source of stream on right of road; road descends on left (s.) bank. Undulating, park-like country, with patches of pine, rich grass, and oak scrub. 4.8 m., Zou-Gunda, altitude 13,235 feet, a military post for changing horses. These posts are called "Tang" by the Chinese, and "Ta-Ma" or "Tang-Ma" by the Tibetans. Gold-washing going on in the stream. Black tent of cattle feeders. Hills on both sides, 400 feet high, sloping 20°; grass, oak, and pine. Grassy valley, 100 yards broad. 5.6 m., cross river to right (w.) bank. On right bank, hills 400 feet high, sloping 20° straight down to stream; grass and oak; oaks, currants, and gooseberries below close to stream. 6 m., road leaves river, which turns s.e., and crosses tributary from w.n.w. Road ascends right (s.) bank of tributary. 6.2 m., on left bank of river, rocks and precipices 100 feet high, sloping 20°; pines and oaks. On right bank, hills 150 feet high, sloping 20°; pines. 6.6 m., hills on right bank, sloping 20° down to stream. Firs in patches, with open grass. 7 m., Cha-Ma-Ra-Doi, 2 or 3 huts; barley and vegetables. Streams enter river from n. and w. 7.7 m., cross river to left (n.w.) bank. 8 m., cross river to right bank. On both sides grassy slopes, 150 feet high, sloping 20°. Above the pines. 8.7 m., on left bank of river, hills 100 feet high, sloping 15°; all grass. 9 m., stream enters river from w. 10.3 m., a "Tang." Source of river. 10.5 m., summit—Deh-Re-La, altitude 14,584 feet. Rounded grassy slopes in every direction. Source of stream to s.e., which flows w. and s. into river, flowing s.e. 11.7 m., altitude 14,455 feet. From this point to the "Tang," 3 miles to the w.n.w., there is a flat grassy valley without trees,  $\frac{1}{4}$  or  $\frac{1}{2}$  mile broad, bounded on both sides by hills 200 to 300 feet high, undulating, and divided by many small valleys. All the hills slope about 25°,



and are covered with grass; no trees anywhere. On the s.w. side the hills rise higher, and a ridge is crossed at the summit. 13.7 m., altitude 13,977 feet, cross river flowing s.e., and ascend on right (s.) bank. 15 m., a "Tang." Road from Lit'ang-Ngoloh to this point very good. 16.8 m., summit—Wang-Gi-La, altitude 15,558 feet. Source of river. Road zigzags considerably on both sides of summit. From this the road goes down a valley, the descent westward to Ho-Chū-ka being very steep and stony. The hills on either side are 200 to 300 feet high, all covered with grass, sloping  $25^{\circ}$  to  $35^{\circ}$  straight down to stream, leaving no flat at the bottom. Not a single tree until close to Ho-Chū-ka, where there are a very few pines on the slopes. 17.4 m., source of river on right of road, flowing s.w.; road descends on left (s.e.) bank. 20.2 m., stream enters river from s.w. 23 m., Ho-Chū-ka, altitude 13,250 feet. The stream from Wang-Gi-La runs here into a river 30 yards broad, flowing s. Rocky cliffs 50 feet high, on point between the two streams. Hills 200 feet high, sloping  $20^{\circ}$ ; all grass, a very few pines.

17th.—*Ho-Chū-ka* to *Lit'ang*.—Road crosses tributary from n.e., and then river to right (s.w.) bank. Road ascends river. .5 m., stream enters river from n. .6 m., stream enters river from n. .7 m., grassy rounded hills 200 feet high, sloping  $15^{\circ}$  to  $20^{\circ}$ , on both sides. 1.1 m., stream enters river from n. 1.8 m., stream enters river from s.w. Hills on both sides 200 feet high, sloping  $40^{\circ}$  on n., and  $15^{\circ}$  to  $20^{\circ}$  on s.; all grass. 2 m., cross stream from s.e. 2.4 m., cross stream from s.e. Sandstone strata displayed, bent in all directions from horizontal to vertical. 3 m., cross stream from s.w. 3.4 m., stream enters river from n. 3.8 m., hills on both sides, 200 feet high, sloping  $40^{\circ}$ ; all grass. 5.3 m., hut; altitude 13,392 feet. Road leaves main river, and ascends right bank of a tributary from w., which enters here. 5.8 m., hills on both sides, 150 feet high, sloping  $25^{\circ}$  to  $30^{\circ}$ ; all grass. 6.8 m., cross river to left (s.w.) bank. 7 m., hills to n., 200 feet high, sloping  $30^{\circ}$ ; hills to s., 100 to 150 feet high, sloping  $10^{\circ}$ . 7.3 m., stream enters river from e.s.e. 7.5 m., river turns from s. Hills on both sides, 100 feet high, all grass; sloping  $20^{\circ}$  on right, and  $5^{\circ}$  on left of road. 8 m., summit—Shie-Gi-La, altitude 14,425 feet. From Shie-Gi-La the plain of Lit'ang is seen. Source of stream; road descends on right (n.) bank. 8.6 m., cross stream from n.w. 9 m., road leaves stream. 9.8 m., cross stream flowing n. It bends sharp round, and road crosses it again at 10 m., flowing s.w. 10.2 m., cross stream flowing s.w. 10.6 m., a good deal of loose sandstone on the road, with patches of gold. 11.5 m., cross stream flowing s.s.w. 12 m., rocks, slaty shale and sandstone striking s.e. and n.w., mixed with quartz. 12.8 m., cross stream flowing s.s.w. 13 m., city of Lit'ang, altitude 13,280 feet; in a bay on northern edge of plain. The plain of Lit'ang lies in a w.n.w., and e.s.e. direction, and is here about 5 m. in width. It is bounded on the n. by the Shie-Gi-La range of beautifully undulating hills, which do not rise more than 200 or 300 feet higher than the pass. Their slopes are gentle, from  $15^{\circ}$  to  $30^{\circ}$ , and covered with grass. Its s. limit is a n.w. and s.e. range of hills somewhat higher and much steeper than that on the n., and behind this is the range of the Surong Mountains, which also runs about n.w. and s.e., where many of the peaks are covered with perpetual snow, as far as can be seen both e. and w. Road from Ho-Chū-ka to Lit'ang, very good indeed; all the country being an undulating plateau of rich pasture. There is not a tree of any description visible the whole way. There are a few trees on the northern slopes of the hills that bound the plain on the s. On the s. side of Lit'ang the hills are all granite.

19th.—*Lit'ang* to *Jiom-Bu-T'ang*.—1.8 m., cross stream flowing s.e. 3.4 m., cross good-sized stream flowing s.e. 3.8 m., on the crest of sandstone spur n.w., there are hot sulphur baths; the gas may be seen escaping through the cracks in the rocks. Lamassery, 1 mile to n. Hot springs about  $1\frac{1}{4}$  mile

to s.e., at foot of spur. Range runs n.w., bounding the plain of Lit'ang. Road from Lit'ang over undulating country on s. edge of plain; it now descends and crosses the plain; grassy. 5.5 m., road crosses Li-Chü River, flowing s.e., by a bridge—Che-Zom-Ka—40 yards span, in 4 bays; piles of loose stone cased with timber, bars stretched across. Road from Lit'ang to this point is excellent; it now ascends right (s.e.) bank of small stream, between low granite ridges, with granite boulders scattered about, and becomes very bad. Everything is of granite, and very bare; no trees. Three valleys are visible, bearing n.w. by w., n.w. by n., and n. by w., and their embouchures into the Lit'ang Plain are each about 5 miles distant. To-Tang (Tibetan), on left bank of stream. 7.5 m., hills on both sides, 30 feet high. 8.5 m., source of stream. 9.7 m., hill on left of road, 100 feet high, sloping 20°; very stony. On right of road, a slope 3° or 4° down to a stream  $\frac{1}{4}$  mile distant, flowing n.e. n.w. of stream is a stony ridge 100 feet high. 10.7 m., a granite hill on left of road, 150 feet high, sloping 15°, covered with loose stones. On right of road, flat ground extends for 300 yards; very stony. To the n.w. is a stony ridge, 100 feet high; granite. 11 m., road crosses a tributary from s., and ascends right (s.e.) bank of river. A valley runs s. between detached, bare, and pointed granite hills. 12 m., Jiom-Bu-T'ang, altitude 14,718 feet. A plain, 1 mile long, s.w. and n.e., 100 yards wide, with poor grass and flowers. Then a ridge on w. side, 50 to 100 feet high, steep and broken, with loose stones. Bounding plain on the s., a ridge 30 to 100 feet high, sloping 30°, loose stones, poor grass. From Che-Zom-Ka to Jiom-Bu-T'ang the road is rough and stony. There are no trees, but wild flowers, grass, and a few shrubs grow among the stones.

20th.—*Jiom-Bu-T'ang to La-Ma-Ya, or Ra-Nung.*—Road through plain to 1 m., end of plain. Road ascends side of hill bounding valley on w.; path stony. 1.3 m., road crosses river. A valley runs s. about 2 miles, closed at end by snowy hills; on both sides hills 100 to 150 feet high, covered with loose stones, grass, and small plants. 3 m., commencement of pass over the Surong Mountains, which run n.w. and s.e., and are 18,000 to 20,000 feet above the sea. The road passes over a rough, undulating, broken plateau—Nga-Ra-La-Ka—covered with loose stones, all granite. Broken jagged peaks like a saw, 2 miles to w. 4 m., altitude 15,499 feet; a very small pond close to road on right; then two sharp rugged peaks, 150 feet high, with a sprinkling of snow. One or two patches of snow on road, only a foot or two long. The plateau is here closed in by broken hills, 50 to 100 feet high, which come down to road; loose granite blocks strewn about. 4.6 m., summit of pass—Nga-Ra-La-Ka, altitude 15,753 feet. Hills on both sides of pass, 50 feet above road; all broken granite blocks. 6 m., lake Cho-Din, on left of road; road descends on left (s.) bank of a river. 6.4 m., cross stream flowing n.w., from lake to river. Snowy peak on left of road. Road between ridges 150 feet high, sloping 10°, covered with loose stones, grass, and wild flowers, except at tops of ridges, where there are only loose blocks. 6.8 m., road very good; wild gooseberries. 7.2 m., flat valley 100 yards broad, closed on n. by ridges, 50 feet high, sloping 10°, with grass and stones; and on s. by ridges, 100 feet high, sloping 10°, nearly all loose stones. 7.7 m., road leaves river and turns to s. 8.3 m., Dzong-Da (Dry Sea), altitude 14,896 feet. Marshy valley, 200 yards wide, running e. 1 mile, between hills 100 feet high, sloping 20°, with grass and stones, backed by peaks 1500 feet high, with snow on them. Cross stream in valley, flowing w. A snowy range bearing w., running n. and s. Very high peak due w., 10 or 20 miles off, 17,000 or 18,000 feet high. 9 m., road good. Plain for 400 yards, then a stream, then grassy hills rising gradually up to the snowy mountains. Stony undulations to s. 9.5 m., cross stream flowing n.w. Commence descent into valley alongside of



ridge. Road stony; all granite. 9.8 m., hills on left of road, 1700 feet above valley. 10.5 m., at bottom the valley runs up s.s.e.  $1\frac{1}{2}$  mile, when it is closed by hills, 1700 feet above valley, sloping  $30^{\circ}$ ; very stony. On s.w. side of valley, grassy hills 200 feet high, sloping  $20^{\circ}$ . On n.e. side, the valley is bounded by the ridge that the road has just descended, 100 feet; very stony descent, by zigzag. Valley runs down n.x.w. 5 or 6 miles, closed by hills 800 or 1000 feet high. 10.8 m., cross stream flowing n.w. From Dzong-Da to this point, rocks all granite; hence to La-Ma-Ya, sandstone and slaty shale. 11.4 m., summit of small ridge; altitude 14,881 feet. Road from Dzong-Da to this point, very stony; to La-Ma-Ya, very good, though narrow in places. Road gains crest of a hill, then descends to a grassy valley; no flat at bottom. Hills on both sides, 200 feet high, sloping  $30^{\circ}$ ; all grass. 12 m., source of Ye-Chü river, on left of road; pines commence. Road descends Ye-Chü on right (n.) bank. 13 m., stream enters river from s.e. Road 100 feet above stream; grass slopes 100 feet above road, sloping  $30^{\circ}$ . Slaty shale. Hills on left bank, 300 feet high, sloping  $30^{\circ}$ . Dense pine-forest. 13.4 m., cross stream from n. Road, a narrow path on side of hills. 13.7 m., stream enters river from s.; a few pines. Valley runs up to s.; pines in the hollows; grassy slopes and tops on both sides, 200 feet high, slopes  $30^{\circ}$ . 14.4 m., cross stream from n.e. 14.8 m., a "Tang"—Ma-Dung-La-Tza. Hills on left side of river, 200 to 300 feet high, sloping  $30^{\circ}$ ; grass and pines. Road crosses river many times. 15 m., cross stream from n.; stream enters river from s.s.w. Oaks on hills on right bank; cliff covered with oak; willows in river-bed. 15.2 m., cross stream from n.x.w. 15.6 m., slopes on right bank  $50^{\circ}$ , with oak and fir the first 100 feet; then grassy slope,  $30^{\circ}$  another 100 feet above stream. On left bank slopes  $45^{\circ}$ , with pines. 16.2 m., cross good-sized stream from n.w. Large valley running up to n., with pines and grass on each side of it down to level of stream. 17 m., road crosses river to left (s.e.) bank. Stream enters river from n.w. Slopes on right side of river 200 feet high, sloping  $30^{\circ}$ ; nearly all grass, a few pines. On left side, slopes 300 feet above river,  $30^{\circ}$ ; all pines. Flat bottom to valley, 100 yards wide; grass; no trees. 17.5 m., cross stream from s.e. Sandstone and quartz, with shale, nearly vertical, striking n. and s. 18.3 m. cross stream from s.e.; stream enters river from n. 18.6 m., stream enters river from n.x.w. 19 m., cross stream from s.e. A large valley runs up n.x.w., in which an important stream enters river. Barley cultivation. 19.5 m., cross river to right (n.w.) bank, by spar bridge (10 yards). Village on right of road. Hills to n., 150 feet high, with grass; much broken. Hills to s., 250 feet high, sloping  $30^{\circ}$ ; grass and shrubs. 20 m., La-Ma-Ya, or Ra-Nung, altitude 12,826 feet. Rounded hills to s., 150 feet high; sloping; grass. Road now leaves the Ye-Chü, and ascends a tributary, which here enters the river, on right (s.) bank.

21st.—*La-Ma-Ya to Nen-Da*.—6 m., three streams enter river very near each other, from n.w., n., and n.e. Rock sandstone, friable shale crops out striking n. and s., strata vertical. 1.1 m., stream enters river from n.; grassy slopes 100 feet high sloping  $15^{\circ}$  on both sides. 1.6 m., summit—Ye-La-Ka, altitude 14,246 feet. Source of river. Grassy slopes to n. 150 feet above pass, sloping  $15^{\circ}$ ; grassy slopes to s. 100 feet above pass, sloping  $10^{\circ}$ . Road good to this point from La-Ma-Ya. Stony and bad zigzag down to grassy plain w., enclosed by stony hills sloping  $20^{\circ}$ . The lower slopes of the western face of hills on e. side and the bed of the valley are of granite. 3.2 m., road crosses river Dzeh-Dzang-Chü, flowing s., by spar bridge. Altitude 13,162 feet. Road in plain of river very good. There is a road down valley of this river to Chung-Tien, a 7 days' journey. 3.5 m., hot springs on right of road—Cha-Chü-Ka. 3.7 m., cross tributary of the Dzeh-Dzang-Chü, flowing s.e. 4 m., commence zigzag up sandstone hill. 4.7 m. summit—Mang-Ga-La, altitude 13,412 feet. Rounded, grassy,

sandstone hills, 300 feet above pass on both sides sloping  $20^\circ$ . Road very fair from valley of Dzeh-Dzang-Chü to this point. 5 m., cross stream flowing E.S.E. 5.2 m., summit. Road at bottom. 5.4 m., cross stream flowing S.E. between grassy undulations to the Nen-Chü river. 5.9 m., cross stream flowing E.N.E. 6 m., summit of grassy ridge, altitude 13,412 feet. A small pond. Ridge extends 4 m. in a direction bearing  $260^\circ$ . Mt. Gombo-Kunga-Ka bears  $270^\circ$ ; another peak of same range bears  $290^\circ$ ; another,  $305^\circ$ ; peaks 17,000 to 20,000 feet high. Road descends from crest of hill by bad, stony zigzag. 6.8 m., cross stream from N.W. Village, La-Ka-Ndo. Road 200 feet above river Nen-Chü. Valley cultivated here. Hills to S., lower slopes  $40^\circ$  down to river, black shale and pines; upper slopes  $30^\circ$ , small trees. Slopes  $40^\circ$  down to river on N., shale and grass, small pines; *Lignum Vitæ*. Road ascends left (N.) bank of Nen-Chü, which at a little below this point bends, and flows to the S. Bad zigzag from summit of Mang-Ga-La to this point; all the rest of road to W. very good. 7.3 m., cross stream from N.W., altitude 12,811 feet. Valley 300 yards wide, all grass, no cultivation. Slopes to S.  $20^\circ$ , pines and willows. Slopes to N.  $40^\circ$  down to river. Shale and grass, small pines; *Lignum Vitæ*. 8.2 m., ruins on right bank of river. 8.5 m., stream enters river from S.E. A very wide, open, gentle-sloping valley; pines and small ash-trees or willows. Hills to N. sloping  $40^\circ$  down to river with rocks breaking through. 8.7 m., cross stream from N.W. 9.2 m., cross stream from N.W. Sandstone cliffs to N., 100 feet high. 9.5 m., valley 200 yards wide, grass. Slopes to S.  $20^\circ$  down to river from peak 1500 feet high; grass, pines, and small willows. Rounded grassy hills to N., 200 feet high; a few small pines. 9.7 m., cross stream from N.W. A small plateau  $\frac{1}{2}$  m. wide, 100 feet above the river on N. side, with low, gentle undulations. 10.5 m., Nen-Da village, altitude 13,133 feet. A peak on right bank, 150 feet high, sloping  $40^\circ$  down to river; pines. Village situated on a grassy plateau  $\Delta$  with stream from N.W. side of Nen-Da mountain. S. side of  $\Delta$  bounded by long straight ridge; N. side by undulating ground, 70 or 80 feet, running up to plateau. River 600 yards distant. A peak (A), 1 m. to S.S.E., 2000 feet high, grass and stones at top, then a belt of pines, then gentle grass slopes,  $5^\circ$  to  $10^\circ$ . From village Nen-Da, angle of elevation to highest point of Nen-Da Peak,  $14^\circ$  by altitude, index error  $+1^\circ 20'$ ; bearing  $290^\circ$ . From Nen-Da, peak (A) bears  $165^\circ$ , sloping  $20^\circ$ ; grass and stones; terminating in precipices 150 feet high at river's edge, with pines growing in crevices. High snowy peak 6 m. N.W. of Nen-Da. Gombo-Kunga-Ka Mt. 6 m. N.W.

22nd.—Nen-Da to Ra-Ti or San-Pa, ascending left (N.) bank of river Nen-Chü.—2 m., cross large tributary from N.W. 1 m., rocky path on side of hill. Below road is a slope  $40^\circ$ , with pines; above road, slope  $20^\circ$ , with grass. 1.1 m., grassy slopes  $10^\circ$  above road; below road, grassy slopes  $20^\circ$ . Road very good,  $\frac{1}{2}$  m. from river. Stream enters river from S.E. A flat, grassy spur thrown out from Mt. to S.W. 1.4 m., road 100 feet above river; slopes  $40^\circ$  down to river; pines and rocks. 1.7 m., cross stream from N.W., in a valley with pines; black, slaty shale, striking N.E. 2.2 m., road on a smooth, grassy spur from Nen-Da Mt. Grassy slopes to N.,  $5^\circ$  to  $15^\circ$  down to river. Grassy slopes from Mt. to S.  $5^\circ$  to  $15^\circ$ , ending in a little, flat plain. 2.4 m., cross stream from N.W. 2.8 m., ground to N. covered by spurs from Nen-Da Mt.; here they slope  $15^\circ$  down to river, all grass, 400 feet high. Precipices at top of Mt. to S., then a clump of firs and a cave; grass. 3.2 m., cross stream from N.W. 3.8 m., cross stream from N.W. 4.1 m., the whole ground on N. side covered with spurs from Nen-Da Mt., which end in a flat plateau of grass, 50 to 150 feet above river. Small grassy plateau to S. Road at river level. Pines in bed of river. 4.2 m., stream enters river from S.S.E. 4.5 m., cross stream from N.W. Ruins of Cho-Tsung or San-Ye-Fun (Chinese) on right bank of river. Mountain to S. 1200 feet high, pines and grass, slopes  $20^\circ$  to river. W. face of Mt., pine-clad. 4.6 m., stream enters river from S.



A grassy spur to s. with plateau. 4.9 m., Yunnan-Chiao; huts, and a bridge over the river. Road 70 feet above river. Pines on lower slopes, grass and loose stones above, on each side of river. 5.1 m., cross stream from n.w., coloured with iron. 5.4 m., cross stream from n.w. 5.7 m., cross stream from n.w. by bridge; (footprints of horse of Wu-San-Kwel.) 6 m., road at river level. Pines, yews, and shrubs by river. Mountain to s., 1500 feet above river, stony top, slopes 20° down to river. 6.5 m., cross stream from n. Pine-clad hollow to s. 6.8 m., stream enters river from s.s.w., in a valley with pines. 7.2 m., cross stream from n. 7.3 m., stream enters river from s.w. 7.7 m., cross stream from n. Rocks, a rotten kind of granite. From Nen-Da village to this point the rocks are of granite; to w.s.w. they are sandstone. 8.1 m., road 50 feet above river. 8.3 m., cross river from n., in a valley, which appears to be the end of Nen-Da Mt. To w. of this stream, road bad. 9 m., road at river level, then ascend 50 feet. Grassy slopes to n. 20° down to river, running up 200 feet, with a few pines. Slopes to s., 700 to 800 feet, 20° down to river; bare rocks above, pines below. 9.1 m., cross small stream from n. by bridge. 9.3 m., road at river-level. A rocky point on left bank, where road is bad. 9.6 m., cross stream from n. by bridge. Pines end on right bank. Hills to s. 700 feet high, sloping 20°; grass and stones. 9.9 m., grassy and broken spurs to n. 10.4 m., cross Nen-Chü by bridge to right (s.w.) bank. Road diverges from river. 10.8 m., cross tributary of Nen-Chü from n.w., flowing n.e. 11 m., Ra-Ti or San-Pa (Chinese), altitude 13,794 feet. The road from Nen-Da to Ra-Ti is very good; it is generally 50 to 150 feet above river.

23rd.—*Ra-Ti to Ta-Shiu or Ta-So.*—To w. of Ra-Ti, road rises on to a grassy ridge, and continues along the crest between the Nen-Chü and its tributary. 2.2 m., Mt. Kung-Rh, about 1 mile to s. ("Rh" is Tibetan for "Mountain," "Da" means "foot of the mountain"). Road crosses the ridge and ascends left (n.) bank of tributary, in valley bounded on both sides by hills 50 feet high sloping 10°; grass, little yews; stone lying about—granite. 3 m., cross stream from n.w. 3.6 m., source of stream. Road crosses dreary plateau; stony. 4.5 m., road up to this point good. 5.2 m., zigzag up to pass; road not bad. 5.8 m., summit—Rung-Se-La or San-Pa-Shan (Chinese) (3 plains Mt.), altitude 15,769 feet. From Ra-Ti to Rung-Se-La the formation is of granite; below the summit on the w. are shales, striking n.e. and s.w. Road descends between two ridges sloping 45°; grass and stones. Easy ascent coming from the w. 6.3 m., altitude 15,087 feet. Shale; a piece of fossil tree was found here. 6.6 m., source of stream on left of road. 6.8 m., from Rung-Se-La to this point, descent not steep, but over rough, sharp stones. Hills have craggy tops. Beyond this, road descends a bad bit. Road descends stream on right (n.e.) bank. 7 m., end of bad bit. 7.4 m., cross stream from n.e. Water-parting to s. Valley running down s. with pines, 2 miles off. 7.7 m., cross stream from n.e. Hills both sides of road 300 to 400 feet high, sloping 15°; all grass. Road keeps above valley which begins here, and runs along its side, descending gently. Stream below falls very rapidly. Road from 7 m. to this point, level and good. Rhododendrons (called "Ta-Ma" in Tibetan). Shale striking s.w. 8.1 m., cross stream from n.e. River 200 feet below road. Slopes 30° on both sides. 8.5 m., cross stream from e. Steep zigzag road, bad and stony. Slopes 40° down to river; grass and dead pines. Rocks on road, hard, blue stone. 9 m., cross stream from n.e. Road rejoins main valley; a little open glade; on left bank of river hills have rocky, craggy tops. 9.3 m., cross stream from n.e. An open glade; pine-clad hills on each side of river. 9.8 m., bottom of Mount, altitude 12,886 feet; stream enters river, which flows to s. through gorges. On left bank, are grassy slopes 30° down to river, with dead pines on lower part; above are torn and craggy precipices. On right bank, at bottom of valley, where stream joins river, is a grassy valley 300 yards wide.

n.w. is a wall of rock 1500 to 1700 feet high, with caves, and pines in the crevices and on lower part of mountain. To E. is a hill with grassy slopes 30° with dead pines. On w. side of river is a dense pine-forest. Valley from Rung-Se-La ends in  $\Delta$  of grass, with a temple. From summit of Rung-Se-La to bottom, road very steep and stony. Road ascends river on left (s.) bank. From this point to Ta-So village the road is exceedingly good. Granite, shale, sandstone, quartz, marble, &c. 10 m., on E. of river, grassy slopes 30° for a height of 700 feet, with ornamental clumps of pines. This forms a range of hills, behind which rise torn and craggy precipices to a height of 1200 to 1500 feet. A huge wall of rock on w. side, 1500 feet above river; bare at top. On lower half, pines in crevices, and a dense forest on lowest slopes 60° down to river. 10.8 m., a belt of pines comes down from mountains on either hand, and runs across the valley. 11.2 m., here the valley is again grassy. 11.9 m., cross stream from E.; stream enters river from w. 13.4 m., cross stream from E. On right bank of river a dense forest of pine. Slopes 60° down to river, above which are bare crags and pinnacles, perpendicular, torn into all sorts of fantastic shapes, 1500 feet above river. On left bank, grassy slopes 30°, with clumps of pines, forming a range 700 feet high; behind these another range of bare crags and pinnacles. Level, grassy bottom, 250 to 300 yards wide. 14.1 m., slopes to E. 40° down to river; oaks and pines. 14.8 m., cross river to right (w.) bank by bridge 10 yards wide. 15.2 m., on left bank, hills 1000 to 1500 feet high, sloping 30° down to river; pines. On right bank, hills 1000 to 1500 feet high, sloping 40° down to river, with cliffs at top; pine and oak. Road diverges from river. 16 m., Ta-Shiu (Tibetan) or Ta-So (Chinese), on a ridge between rivers; altitude 13,347 feet. At Ta-Shiu, on bearing s.w., 300 yards distant, a stream, then grassy, broken slopes 40° down to river; 500 feet above that, cliffs for another 500 feet high, pinnacles, and crags. Pines amongst rocks. On bearing N.E., plateau for 300 yards, then a green, grassy spur 150 feet high, slope 20°, running down to river E.S.E. S.E., grassy plateau  $\frac{1}{4}$  mile down to river, then pine-clad slopes and mountains 1500 feet high, with cliffs at top. N.W., stream 300 yards distant, slope 40° down to river, small brushwood for 500 feet, then cliffs another 500 feet higher. Pinnacles and crags with pines among them.

24th.—*Ta-Shiu to Pun-Jang-Mu or Pung-Cha-Mu.*—River to w., flowing S. 2 m., cross stream from E. 5 m., slopes 60° down to river, much broken, with shrubs for 100 feet, then perpendicular crags of granite and quartz. On right bank, pines at bottom for 100 feet, then perpendicular cliffs 600 feet higher. 1.1 m., road descends to river, which it then ascends on left (N.) bank. 1.7 m., stream enters river from W.S.W. Hills on right bank of river 50 feet high, 20° slope; oak on right bank, and yew-shrubs on left. 2 m., hills on left bank 200 feet high run straight down to river. No shrubs here; great quantities of *Primula*. Slopes 25° down to river, with barberry and yew-shrubs on them. 2.2 m., hills 200 feet high both sides of river, sloping 15° straight down to stream; grass at bottom. 2.3 m., altitude 14,902 feet. Hills on left bank 300 feet high sloping 15° down to river. Rocks cropping out; tops hidden in mist. Road steep but good. 2.6 m., hills 300 feet high on both sides of river sloping 15°; grass and very low scrub. *Primula* at bottom in large quantities. 2.8 m., cross stream from S.E. 3.3 m., hills on right bank 300 feet above river; grass and low scrub; hills on left bank 400 feet; grassy valley 100 yards wide. 3.6 m., hills on left bank 200 feet high sloping 20° down to river. Road 50 feet above stream. 4 m., on right bank, crags and rocks, with broken grass slopes rising 100 feet above river. Small pond 100 yards S. of river. 4.4 m., source of river. 4.8 m., a pond amongst broken crags and rocks; altitude 16,129 feet. Broken slopes, with debris lying about everywhere. Cliffs 150 feet. The road from Ta-So up to this point is very good, though steep. Here



it ascends an almost perpendicular cliff by steep zigzags for  $\frac{1}{2}$  a mile w. up to J'rah-Ka-La. 5.3 m., summit—J'rah-Ka-La, or Ta-So-Shan (Chinese), altitude 16,568 feet. Road now descends a very steep slope. 5.6 m., altitude 16,336 feet. 6 m., centre of a circular basin 2 miles in diameter, surrounded by bare and rugged cliffs, almost perpendicular, terminating above in pinnacles and jagged peaks. A few small ponds in basin, and huge masses of rock and debris are scattered about. Where cliffs slope slightly, they are covered with loose debris. Pinnacles and crags 300 feet high. 7.6 m., hills 500 feet high, sloping  $25^\circ$  down to river, covered with debris of broken stones. Road improves a little. Source of stream on left of road; road descends on right (N.) bank. 8.1 m., altitude 15,555 feet. Hills to s. 1500 feet high. 8.8 m., cross stream from N.E. Hills to s. 1000 feet above river, sloping  $40^\circ$ ; much debris of broken rock with precipices; some grass on the slopes. Slopes to s. covered with shrubs and debris. In bed of stream, stones and scrub. Road bad. 9.4 m., hills to s. 1000 feet high; craggy rocks, with yews amongst them, 900 feet above river. Hills to s. 1500 feet high. 10 m., road on slope, very bad, 50 feet above stream. Crags at tops of hills, with stony slopes below,  $20^\circ$  down to river; yews, pines, and holly oak. 10.2 m., hills to s. 1500 feet high. From this point to Pun-Jang-Mu, lower slopes on both sides of river covered with dense pine-forest, with some oak and yew in valley. 11 m., hills to s. 1000 feet high. 11.8 m., hills to s. 800 feet above river, sloping  $40^\circ$ . 12 m., cross stream from N.W. by bridge. 12.8 m., stream enters river from S.E. 13.2 m., cross stream from N. Pun-Jang-Mu (Chinese), Pung-Cha-Mu (Tibetan), altitude 13,158 feet; 200 feet above river. Barley cultivation.

25th.—*Pun-Jang-Mu to Bat'ang.*—Road descends river on right (N.) bank. 4 m., hill to s. 400 feet above river sloping  $30^\circ$ , a little craggy at top; dense pine-forest. To N., slopes  $35^\circ$ ; limestone formation; dense forest of pines and oaks.—Ta-Ma,—gooseberries and currants; big oaks. Shale like fossil wood. 1.4 m., hills to s. 1000 feet high, sloping  $50^\circ$  down to river; remarkable bluff at top. 2.4 m., hill to s. 700 feet above river; rock at top, then a grassy slope, of  $30^\circ$ , down to river, below that, a dense pine-forest. 2.8 m., dense pine-forest to s. 3.2 m., road 600 feet above river. Dense forest nearly all oak, a few pines. 3.9 m., stream enters river from s. 4.4 m., on the bearing  $312^\circ$  is a very distant hill with a remarkable knob, 3 days' journey from Bat'ang. It is called "Tang-Ye." 4.7 m., road and river enter a narrow gorge with cliffs; limestone striking N.W. 4.9 m., cross stream from N.E.; forest of oak. 5.5 m., cross stream from N.E.; a good many plum-trees in valley. Hills sloping  $15^\circ$  down to river. 5.7 m., a little cultivation in valley. 5.9 m., Ba-Jung-Shih or Hsiao-Pa-Chung; altitude 10,691 feet. A few houses. Bridge across river. Stream enters river from S.W. Hills to N., 500 feet above river, cliffs at top; slopes below,  $30^\circ$ , with debris. Shrubs and briars on slopes. On s. side, forest nearly ends, but oak and pines still on slopes. Much snapdragon and mint in valley. 6.2 m., cross stream from N.E. 6.8 m., hot spring on right of road. Cross river to left (S.) bank by bridge 7 yards wide. Poplars and willows in the valley. Cliffs to s. 20 feet above river, where it has cut its way through deposit. Hill 2 miles to s. 1000 feet high sloping  $35^\circ$ . 7.3 m., cross river by bridge to right bank. Hills to s. 800 feet high sloping  $40^\circ$  down to river; oak; first walnut. Hills to N. 600 feet high sloping  $40^\circ$  down to river; low scrub. 7.7 m., hills on both sides 1000 feet above river, rocky and broken, slopes  $60^\circ$ , with scrub. Stream enters river from S.W. 8 m., the river enters a narrow gorge with precipices on both sides. 8.6 m., cross river by bridge to left (S.) bank. 8.8 m., road rocky, narrow and steep, cut out of hill-side. 8.9 m., cross river by bridge to right bank. Hills to N. 1000 feet high, grassy slopes  $30^\circ$  or  $40^\circ$  down to river. 10 m., hill to s. 1000 feet above river, broken slopes  $50^\circ$ ; pines at top. 10.5 m., end of narrow gorge; precipices both sides of river. Road rocky, steep, and bad,

cut out of hill-side. Limestone striking n. and s. Hill to w. 700 feet high, slopes 20°; grass. 11·5 m., hills on right bank 300 feet high, bare crags, slopes 70° down to river. Hills on left bank 200 feet high. 12·6 m., Bat'ang or Ba (Tibetan); altitude 8546 feet. Plain on bearing 305°, 1 mile wide. Mount bearing 270°, 1000 feet high, slopes 30° to 40° down to river; broken in parts, bare in others; grass on upper slopes and a patch of cultivation high up. Lamassery  $\frac{1}{2}$  mile to w.

29th.—*Bat'ang to Chu-Ba-Lang*.—Cross river by bridge to left (s.) bank. 6 m., large stream enters river from n. Road descends river (25 yards wide) on left (s.e.) bank. 2 m., valley 300 yards wide; no cultivation. 2·5 m., cross stream from e.s.e. 3 m., village; patch of buckwheat. Hills on both sides 1000 feet high, sloping 60° down to river; those on left bank throwing out rugged and broken spurs, with pines at the top, far back; those on right bank rather bare below, grass at top. Hills all sandstone with much iron. 3·3 m., hills run right down to river; no plain at bottom. 3·5 m., house with walnuts and weeping willows. Stream enters river from s.s.e. Road leaves river, which flows on s.w., and afterwards s.e., 3 m. into the Chin-Sha-Chiang, and ascends stream on right bank. 4·3 m., cross stream. 4·5 m., a zigzag commences. 5 m., summit—Ch'a-Shu-Shan (Chinese), Cha-Ku (Tibetan) (Tea Tree Mountain); altitude 9388 feet. Road winds down side of hill; slopes below to river 40°; slopes above road 15°. 5·4 m., from Bat'ang to this point hills slope about 45°, and are very stony and bare, long slopes of debris lying all over the road. Here they run up to 1000 feet, on left bank of river, with pines at the top, and 700 feet on right bank, with grass, bare in places. The road gradually descends till 6·4 m., when it is 100 feet above the Chin-Sha-Chiang, which is 170 yards wide. Slopes of 30° down to river, very stony; with many briars and yellow jasmine. No plain below. Road descends Chin-Sha-Chiang on left (e.) bank. 7·2 m., cross stream from e. 8 m., Niu-Ku; some sago cultivation. 8·7 m., Leh or Choui-Mao-Kiu, a silent monastery, containing a few Lamas. Stream enters river from w. Hills on both sides, 600 feet high, sloping 30° sheer down to river; bare and stony. Narrow stony path along edge of river. 10·2 m., village on right bank, with cultivation. 11·6 m., cross stream from e. 12·3 m., stream enters river from w. Hills on both sides as far as 15 m., 600 feet high, sloping 35°; those on right bank very bare and stony; those on left bank with many broken cliffs and precipices; slopes of debris coming down over the road. 13·5 m., stream enters river from w. 15 m., fort. Cross stream from e. 16·2 m., house and walnut-trees on right bank. 17 m., cross stream from e.; a few holly-leaved oaks at top of valley. 18·7 m., Chu-Ba-Lang or Chru-Ba-Long (Chinese), altitude 8165 feet, a village on both sides of river with more than 10 families on each side—about 30 altogether. Streams enter river from e. and w.

30th.—*Chu-Ba-Lang to Kong-Tze-Ka*, descending the Chin-Sha-Chiang. —5 m., cross stream from e., with waterfall. 1·1 m., road, a rocky path 50 feet above the river, covered with debris. Hills on both sides of river, 1000 feet high, sloping 35°; very bare and rocky. Stream enters river from w., of a red-brown colour, called Shieh-Chu. 1·8 m., cross stream from e.; its valley leading up to pines and oak. 2·3 m., cross stream from e.; s. of its valley, the rocks are of granite. 2·9 m., cross the Chin-Sha-Chiang, which is 170 yards wide to right (w.) bank by ferry. Road from Bat'ang up to this point very rocky, running along close to water. Hills on both sides very bare, and much broken, with slopes of debris and cliffs. Height generally about 1000 feet, sloping 35° to 50°. 3·5 m., stream enters river from e. 4 m., rapids and shallows in river. 4·2 m., flat point running out into river from right bank, covered with thorns; then cliffs, alternating with slopes of 60°; precipices 150 feet high at top. Mountains 1000 feet high. Sandstone and much quartz. On left bank are cliffs 60 feet high, rising straight up from river, then steep, bare, broken rocks, with much debris lying



about. Mountains 1000 feet high, sloping  $60^{\circ}$ ; on the top are grass and oaks. 4.7 m., road close to water, running under a cliff 30 feet high, and covered with loose stones and debris. Cliff alternates with slopes of debris. 5.3 m., cliffs on left bank, 500 feet high. Another flat point on right bank, very stony, with thorns. River valley opens out to  $\frac{1}{4}$  mile wide, the flat ground at bottom being covered with stones and thorn-trees. Cross stream from w.; its valley runs up amongst cliffs and very steep slopes. The mountains are much broken. A cliff at top 200 feet high. 6 m., stream enters river from e. 7.6 m., Gue-Ra, altitude 8660 feet; a village of 5 or 6 families, about 50 feet above the river. Cross stream from w. To the e. is a hill 1000 feet high, with slopes of  $60^{\circ}$ , and precipices; very bare, with slopes of debris; pines and oaks at the top. From here the road gradually rises, and shortly leaves the river. It is bad and stony, very narrow in some places, and running along steep slopes of debris. 8.4 m., stream enters river from s.s.w.; road ascends left (w.) bank of stream. Chin-Sha-Chiang diverges to s.e. 9.2 m., village, with walnuts, weeping willows, buckwheat, and sago. Spurs on right bank, 300 feet high, sloping  $20^{\circ}$ , from mountains 500 or 600 feet high, bare and craggy, with steep slopes of debris. A good deal of thorn-scrub on them, and in the valley. On left bank, hills 1000 feet high, sloping  $30^{\circ}$ ; their lower parts bare and craggy, with slopes of debris; halfway up are patches of cultivation, and on the top, trees. The road is very stony, in bed of stream. Stream enters river from s.w. 10.8 m., large village near right bank. A good deal of terrace cultivation in bed of stream; sago. Spurs on right bank 400 or 500 feet high, sloping  $20^{\circ}$  to  $60^{\circ}$ , with patches of cultivation on least steep parts; long slopes of debris. Hills behind 800 feet above stream, with pines and oak at top. Hills on left bank 800 feet high, sloping  $40^{\circ}$ ; craggy, with scrub and oak at top. Road up to this point is very stony, but not very steep. 11 m., road crosses river to right (e.) bank. 11.3 m., stream enters from s.w. Altitude 9971 feet. The highest and last walnut-tree. 11.7 m., altitude 10,392 feet. First oak, in bed of stream. Hills on both sides 1000 feet high, sloping  $30^{\circ}$ , much broken; slopes of debris, with shrubs and some oak. Road very stony. 11.9 m., altitude 10,670 feet. First pine, in bed of stream; mint. Cross stream from e. Hills on both sides slope  $60^{\circ}$ , coming straight down to stream. Road along bottom; ascending very steeply; a very stiff zigzag commences. 12.5 m., end of zigzag. Hills on both sides 400 feet high, sloping  $20^{\circ}$ , with oaks and thorns; pines on left bank. Road not quite so steep for  $\frac{1}{2}$  mile; it is then very steep again, but hardly so stony. Stream enters river from w. Road now turns to s.e. for  $\frac{1}{4}$  mile, crosses stream from s.e., and then comes back again to stream it has been following. 13.2 m., Ch'a-Shu-Shan, bears  $11^{\circ}$ . 13.5 m., slopes on right bank of  $20^{\circ}$ , on left of  $30^{\circ}$ , both 500 feet high, with poplars, oaks, and pines. Ascent not so steep; blackberries, oaks, poplars, thorns, and briars. Stream enters river from w. 13.7 m., road turns to s.e., crosses stream from s.e., and comes back to right bank. 14.1 m., slopes on both sides of  $20^{\circ}$ , 150 feet high, with dense forests of pines and oaks. Road 100 feet above stream, and not quite so steep. 14.2 m., stream enters river from w. Ch'a-Shu-Shan bears  $12^{\circ}$ . 14.8 m., summit—Kong-Tze-La-Ka, altitude 11,972 feet. Small grassy plateau to e. Grassy hills each side, 200 feet high, sloping  $15^{\circ}$ , with oak. A grassy plain leads to, 15.4 m., village of Kong-Tze-Ka, altitude 11,675 feet; residence of a Tou-Chien-Hou, chief of 1000 families. (We lodged in his house.) 20 houses here and 20 families. To the w. a hill 200 feet high, sloping  $20^{\circ}$ , with oak; hill to e. 200 feet high, sloping  $15^{\circ}$ , with oak and a few pines. Plateau between the hills, 200 yards wide. At this village, buckwheat, wheat, barley, peas, gooseberries, and sago were cultivated.

31st.—Kong-Tze-Ka to Kia-Ne-Tyin.—2 m., cross stream from w. 3 m., cross stream from w. This stream flows into a river on left of road, which

turns to E. at this point. Road ascends left (w.) bank of river. 1.1 m., cross stream from w.; road 200 feet above stream. 1.6 m., cross stream from w. 1.8 m., slopes, on each side, of 20°, 300 feet high, with oak. 2.5 m., cross stream from w.; road at river-level, altitude 11,462 feet. 3 m., ridge on right bank 150 feet high, with briars; behind it, slopes of 20°, 1000 feet high, with pines and oaks. Slopes of 35°, 700 feet high on left bank, with briars and oaks. 3.7 m., road a little stony, but still good. Pines and oaks on slopes. Cross stream from w.; its valley is wooded, with cherries, pines, and willows. 4.3 m., valley of river opens; red clay and red sandstone. Grassy slopes 5°. Road very good. 4.7 m., only willows in valley. Hills 100 feet high, sloping 10°. Clay deposit. 5.2 m., mountain on right bank, 3000 feet high, throwing out grassy spurs, 100 to 200 feet high, sloping 10°. It is bare and craggy at the top, with pines in the hollows. On left bank is a grassy plain  $\frac{1}{2}$  mile wide, with broken red clay slopes; oaks and grass. 5.5 m., house on right bank; stream enters river from E. 6.2 m., Mung-M'heh (Tibetan) or Chung-Mong-Li (Chinese), altitude 12,189 feet (the property of the French missionaries.) On right bank, spurs from same mountain as at 5.2 miles; beyond this a range 2000 feet high, sloping 10° to 20°, bounds the valley on the E. Many valleys run up into it, with pines in the hollows; slopes all grass. Grassy spurs thrown out from it. Houses and cultivation at entrance of the valleys running up into the range. On left bank, red clay and sandstone spurs 100 feet high, sloping 5° to 10° much broken by ravines cut up by small watercourses. Valley 200 yards wide; a few clumps of trees in it, and barley. Beyond, the valley is bounded on w. by spurs thrown out from a mountain, 1000 feet high, sloping 15° to 20°; all grass. Spurs of red clay about 100 feet high; grass, with some bare patches. Many yellow flowers in plain, which is here  $\frac{1}{2}$  mile wide. Valley of river 200 to 500 yards wide; flat and cultivated. Lamassery on top of grassy spur, 100 feet high. French missionaries' house at foot. 10 m., Jang-Ba, called by the Chinese Pa-Mu-T'ang, altitude 12,793 feet; residence of an officer called a Ma-Pen in Tibetan (Chinese rank of Chien-Tsung). End of the plain from N.; here commences an undulating plateau. The river runs between grassy slopes of 5° to 10°. The road follows it for a mile, and then ascends a spur between two streams. S.W. of Jang-Ba the hills are of red sandstone and red clay. Road from Kong-Tze-Ka to this point, very good indeed. 11.6 m., an encampment of Tibetans, about 1 mile W. of this point. There were 300 men who had come out to oppose us. Road diverges from river. 12 m., a chain of jagged mountains to S.E.; between the road and these are gentle grassy undulations, which run up to the spurs from them. Road from this point to the S. for 3 m. very good, over an undulating plateau of grassy slopes. 13 m., altitude 13,956 feet. 14.7 m., altitude 14,376 feet. Grassy slopes above road, with patches of pine. Road turns S.E. for about  $\frac{1}{2}$  mile, crosses stream flowing S.W., then turns W. for about  $\frac{1}{2}$  mile, and then to S.W. again. 15 m., altitude at crossing of stream, 13,850 feet. 15.6 m., altitude 14,280 feet. Road runs along side of grassy hill, sloping 30° down to stream on right of road. Grassy slopes above road on left, of 5° to 10°, with clumps of oak and pine, and single ornamental trees like a park. Undulating downy country in every direction. 16 m., to N. and W., gentle sloping hills of red sandstone, rising 500 or 600 feet above the river; they are much cut up by cultivated valleys. Slopes of hills covered with grass, and large pine-woods with some oaks. 16.3 m., cross stream flowing W.; village on right of road. 16.6 m., cross stream flowing S.W. 17 m., road on a level plateau about 200 yards wide, beneath which are grassy slopes down to river 400 feet below. Cultivation on plateau. Slopes above 10°. Pines in patches. 19 m., Kia-Ne-Tyin, altitude 13,135 feet. Road from Jang-Ba to Kia-Ne-Tyin, very good indeed all the way. At Kia-Ne-Tyin is a cultivated plateau between the two rivers (the western is the larger river). To W. of this are grassy slopes 400 feet



high, sloping  $20^{\circ}$ , with firs and oaks. To the E. above the stream are grassy slopes of  $5^{\circ}$  to  $10^{\circ}$ , all red clay and red sandstone, much cut up by torrents and watercourses.

*Sept. 1st.—Kia-Ne-Tyin to Dzung-Ngyu.*—2 m., cross stream, flowing s.w., and descend its left (s.e.) bank for nearly a mile. 1.2 m., cross stream from E.S.E. 1.6 m., road 50 feet above river, through a wood of small yews and junipers. On the w. is a small ridge 50 feet high. Pine hills to w. of main stream. To the E., slopes  $30^{\circ}$  of red clay, 100 feet above river, with grass and many yellow flowers. Road diverges from river, which flows s.w. 2.1 m., sandstone ridge to E., 30 feet high, with pines, yews, and junipers. Road through a grassy plain 100 yards wide, with many small yews, junipers, and Chiena-Ragi (a kind of tree). 3.3 m., hills on left of road 100 feet high, of red sandstone, much cut up by ravines and broken; pines and yews. Hills on right of road 300 feet high, sloping  $30^{\circ}$ , with oaks and yews. 4 m., source of river on right of road; road descends left (N.E.) bank. 4.8 m., on left of road, sandstone hills 100 feet high, sloping  $60^{\circ}$ , nearly bare; on right of road, hills sloping  $35^{\circ}$ , covered with pine. 5.1 m., cross stream from N.E. Village on right bank of river. Ruins on left of road. In valley of stream is deposit of red clay, stones, and sand. Red sandstone slopes; small trees scattered about. 5.8 m., cross stream from E.N.E. Red spurs on w. of river 100 feet high, from mountain 1000 feet high; pines and oak. 6.8 m., cross river to right (w.) bank; ruins on right bank. On left bank spurs ending in cliffs 30 feet high; red deposit. On right bank, spurs from hill 500 feet high, very red; a few pines scattered about. 7.2 m., a cavern and religious tumulus. Strata inclined  $45^{\circ}$ . 8 m., slopes on both sides, much cut up with ravines; a sprinkling of small trees. Road, from Kia-Ne-Tyin up to this point very good indeed, along red sandstone; it now gets stony. Valley narrow. 9 m., road diverges from river, which flows S.E. into the Kiang-Ka, and crosses a low spur. 10.2 m., Dzung-Ngyu (improperly called Dzon-gun), altitude 10,792 feet. On bearing  $120^{\circ}$ , a mountain 1000 feet high sloping  $40^{\circ}$ ; red sandstone showing through grass; pines at top; base of mountain 500 yards distant, close to river Kiang-Ka; at 1 mile distant, on bearing  $73^{\circ}$ , it terminates in white cliffs 50 feet high. On bearing  $35^{\circ}$ , a mountain 1000 feet high, sloping  $35^{\circ}$ , with white sand showing through grass. This is behind low red spurs, and runs down to a point on bearing  $80^{\circ}$ ; 2 miles distant, and on bearing  $360^{\circ}$ , it runs down very low. Two small hills on bearings  $22^{\circ}$  and  $50^{\circ}$ , of red sandstone, 100 feet high, and quite bare. Crops, wheat and barley. Valley 150 to 500 yards wide. The road runs along N. side of plain, close to the foot of the hills.

*2nd.—Dzung-Ngyu to Nieh-Ma-Sa,* descending the Kiang-Ka on left (N. and E.) bank.—6 m., cross stream from N. 2 m., cross stream from N. by bridge. River here is 15 yards wide. The small plain ends. Rocks of grey sandstone on both sides. 2.3 m., plain 200 yards wide, with thorns, weeping willows, and barley in it. 2.8 m., cross stream from N.E. 3 m., stream enters river from S.W.; ruins at its mouth. On left bank, broken slopes of  $40^{\circ}$ , 500 feet high; sandstone; grassy. On right bank, hills 800 feet high sloping  $60^{\circ}$ ; craggy, with broken tops; yews and pines; sandstone. 3.7 m., cross stream from N.E.; stream enters river from S.W. House on left, ruins on right, bank of river. 4 m., small island in river. 4.2 m., rocky point of slaty shale and sandstone (not red). Hills as before. 4.3 m., cross stream from E.N.E. in a wide, open valley, in which is a village and much cultivation; walnuts. This valley runs up to a mountain behind, 3000 feet high, with precipitous and craggy top; pines. 4.8 m., village on right bank; a little flat cultivated ground at the point. Stream enters river from S.W.; its valley runs up to a mountain 2000 feet high, with pines. On left bank, friable, rotten shale, striking S., dip  $30^{\circ}$ . Hills 600 feet high, sloping  $45^{\circ}$ ; grass and thorns. 5 m., cross stream from E.N.E. Road rises 200 feet above river.

A flat point projects to the w. beyond the spur; cultivated. Hills on right bank 1000 feet high, sloping  $40^{\circ}$ ; rather bare. 5.3 m., cross stream from e. 5.7 m., village of Boah-Tsa. Stream runs through village from e. Road from Dzung-Ngyu to Boah-Tsa, good. 6.4 m., ruins. 7 m., hills on both sides, 700 feet high, sloping  $50^{\circ}$ ; craggy, rather bare, no trees. 7.6 m., hills on right bank, 500 feet high, sloping  $60^{\circ}$ . 7.9 m., precipices on left bank 400 feet high. Rocky point. 8.2 m., stream enters river from s.w.; ruins at its mouth. On right bank, cliffs 1000 feet high. On left bank, broken slopes of  $60^{\circ}$  to  $70^{\circ}$ , 700 feet high. Road bad, especially at points; no plains; hills run right down to river. 8.8 m., cross large stream from s.e.; village with walnut-trees. On right bank, cliffs 500 feet high; strata vertical, striking n. and s. 9 m., cliffs on right bank 400 feet high; on left bank, cliffs and slopes of  $70^{\circ}$ , 700 feet high, with pines at top. 9.4 m., on right bank, a peak 1500 feet high, sloping  $70^{\circ}$ ; broken. On left bank, rocky, point; hills 1000 feet high, sloping  $50^{\circ}$ ; broken and all bare. Road very bad. 9.7 m., cross river to right (w.) bank by spar bridge. 9.9 m., cross stream from w. with a sulphury smell. Hills on both sides 1000 feet high, sloping  $50^{\circ}$ , much broken with cliffs. 11 m., rocky slopes of  $70^{\circ}$  on both sides; no trees; very bare. Stream enters river from e. 11.6 m., a small patch of buckwheat close to water. 11.7 m., bridge across river; stream enters river from e. House on left bank, with walnuts, weeping willows and buckwheat. On right bank, cliffs, and broken slopes. On left bank, cliffs 400 feet high; above these, slopes for another 400 feet, with a few trees at top. Road very bad. 12.5 m., cross stream from w.; stream enters river from e. House on left bank, with walnut-trees. 12.8 m., small patch of cultivation on right bank. 13 m., a cave in the rock 100 feet above river. Broken slopes  $70^{\circ}$ , 1000 feet high, craggy at top, on left bank. 13.5 m., on right bank, slopes 1000 feet high,  $60^{\circ}$ . A mountain 3000 feet high, with pines, bearing s.s.w. 16 m., broken crags on right bank. On left bank, hills 1200 feet high, sloping  $70^{\circ}$ , broken. 16.1 m., cross large stream from s.w., which runs between precipices; after which a house, with walnuts, peaches, and a little cultivation. 16.3 m., cross stream from s.w. On right bank of river, slopes  $40^{\circ}$ , with tufts of grass and shrubs. On left bank, slopes  $40^{\circ}$ , 200 feet high; above this, grass slopes of  $15^{\circ}$ , 1000 feet high, with crags at top and a few trees. 17 m., on right bank, craggy and broken slopes,  $45^{\circ}$ , 1500 feet high; a mountain, 3000 feet high, with pines, bears s.s.e. On left bank, craggy and broken slopes,  $45^{\circ}$ , 1500 feet high. 18 m., village, with walnuts, peaches, and buckwheat; altitude 9885 feet. On right bank, slopes  $60^{\circ}$ , 200 feet high; very bare. On left bank, spur from mountain 3000 feet high. Rocks, slaty shale and sandstone. Road here leaves river Kiang-Ka, crosses stream from s.s.w., and ascends its right (e.) bank. 18.3 m., on left bank, slopes  $50^{\circ}$ , 1000 feet high, very rocky. On right bank, slopes 1000 feet high; spur from mountain; crags, and debris. 18.6 m., enter very narrow gorge; walls of rock on both sides, 1000 feet high; bed of stream only a few yards wide. 18.7 m., cross river to left (w.) bank by spar bridge. 19 m., slopes of  $60^{\circ}$  on left bank. 19.1 m., cross large stream from w., which runs between steep slopes and precipices. 19.2 m., altitude 10,387 feet. On left bank, slopes  $70^{\circ}$ . Two oaks growing close to water. On right bank, slopes  $70^{\circ}$  for 100 feet, then cliffs for another 200 feet. 19.5 m., slopes  $40^{\circ}$ , 800 feet high, on both sides. 19.7 m., cross river to right (e.) bank by spar bridge, and recross almost immediately, to left (w.) bank by spar bridge. 20 m., rocky point on left bank; on right bank slopes  $40^{\circ}$ , with cliffs at top. Village at point, with walnuts. Road ascends a small stream a little way and crosses a spur running out into river, on which is the village. Road is then 200 feet above stream. Slopes  $40^{\circ}$  below the road to river; above the road slopes  $30^{\circ}$ ; all thorns and grass. 20.2 m., cross stream from w. 20.5 m., on right bank, slopes  $40^{\circ}$ , 1000 feet high, with pines at top. 21.1 m., stream enters river from s.e.



Road still 200 feet above stream. A low wooden pilo. Road commences to descend here. 21·3 m., cross river to right (E.) bank by a spar bridge. 21·4 m., Nieh-Ma-Sa, altitude 10,868 feet; a village of 7 families, in a small plain, 200 yards wide, with barley and walnut-trees. Hills on right side of river, 800 feet high, sloping 35°; bare; behind these, mountain tops are visible. On left bank, slopes 40°, 1000 feet high; bare. Road all the way from Dzung-Ngyu is exceedingly bad, over loose stones, and in many places very narrow, with steep ascents and descents. In two places steps are cut in the side of a precipice. Hills all the way, very bare, with tufts of grass and thorns, but the rock always shows through.

3rd.—*Nieh-Ma-Sa to Tsa-Leh.*—Cross river to left (W.) bank; road rises immediately 50 feet above river. Pines at top of slopes on both sides. 6 m., ruins on right bank. Hills on right bank 800 feet high, sloping 40°; pines, oaks, briars, thorns, and bare patches. On left bank, a small plateau 500 yards square, 200 feet above river; slopes above road 20°, with cliffs at top, whose summits are 800 feet above stream. 8 m., ruins on left bank. 1·2 m., stream enters river from E. A patch of cultivation, and a house between road and river. 1·5 m., stream enters river from E.; pines in its valley. Hills on right bank, 1000 feet high, sloping 30°; pines, oaks, thorns, and patches of grass, but rather bare. On left bank, slopes above road 15°, 1000 feet high; pines and oaks at top. Road 200 feet above river; slopes below 30° down to it. 1·7 m., houses on both sides of road. Hills to W., running back, form a sort of basin in which is cultivation. 2 m., road begins to descend to river. Ruins. 2·2 m., small plain begins at level of river on left bank, 200 yards wide. Barley cultivation. 2·4 m., Ma-Ra, altitude 11,505 feet; a village of 3 families. Stream runs through from W.; its valley runs up between cliffs, with pines. Small patch of cultivation. Hills 1000 feet high, sloping 20°, with pines at top, grass and thorns below, rather bare. Hills on right bank 1000 feet high, sloping 35°, broken with cliffs; pines, grass, and thorns, but rather bare. Barley cultivation and gooseberries. 2·6 m., road 50 feet above river, and very good. Bare trees in valley. Plain ends. 3 m., wood of pines, poplars, ferns, oaks, and wild flowers. 3·1 m., stream enters river from E., pines and oaks in its valley. Slopes on right bank of river, 30°, 500 feet high, much broken; behind which are precipitous mountains 1500 feet high. Slopes on left bank, 30°, with oaks and thorns. 3·3 m., precipices rise up from river, on both sides. Road at river-level. Wood of poplars and firewood pines. 3·4 m., cross river to right (E.) bank. 3·6 m., precipices on both sides, 500 feet high. 3·8 m., road passing through the same wood. Precipices on both banks, with pines and oaks in crevices. 4·1 m., slopes 10°, above road on right bank; poplars. On left bank, hills 500 feet high, sloping 70°; very craggy, with oaks and thorns. Road commences to rise above river. 4·6 m., hills on left bank 1500 feet high, sloping 20°; oaks. Lamassery to N.W., 700 feet above river, in a kind of basin, with cultivation. Road 150 feet above river, and out of the wood, which continues below. Oaks and thorns still about the road. 4·8 m., stream enters river from W., its valley runs between precipices, with pines. Slopes 15° above the road, on right bank; grass, oaks, firs, and poplars. Below road, slopes 40°; oak. On left bank, slopes 30°, 1500 feet high, with grass and oaks; dead pines at top. 5·1 m., road at river-level, through poplar wood. 5·3 m., stream enters river from W. 5·5 m., on right bank slopes 30°; grass and oak. On left bank slopes 20°; grass, pines, and oaks. 5·7 m., ruins on right of road; house on left. 5·8 m., on right bank, patch of cultivation. A bare peak 800 feet high, slopes 30° up to it; oaks, pines, poplars, thorns, grass. 6 m., cross river to left (W.) bank. Stream enters river from E. 6·2 m., village with pilo; barley. 6·8 m., road at top of a spur 500 feet above river. Wood of oak, pines and poplars. On right bank, mountains 2000 feet high, bare at top, with cliffs, pines lower down. On left bank,

mountains 2000 feet high, with dense oak wood. 7.3 m., on right bank, same craggy mountain; oaks and grass below; lower slopes 30°. On left bank, hills 600 feet high, sloping 30°, with oaks and pines. Road close to river. A very flat, grassy plain commences, 200 yards wide. 8.2 m., cross river to right (E.) bank. 8.4 m., Tsa-Leh (improperly called Tsa-Li), altitude 12,690 feet. Village situated in a small flat, grassy plain; with hills on W. of river, 600 feet high, sloping 40°; hills to E. and S., 200 to 300 feet, sloping 60°, bare crags at top. Barley cultivation in plain. Streams enter river from E. and W. Road very good all the way from Nieh-Ma-Sa. Rocks on both sides of sandstone, grey and yellow, and friable slaty shale. The bare hills cease at Nieh-Ma-Sa, and all the way beyond are well covered with grass where there are no trees.

4th.—*Tsa-Leh to Láng-Zúng-Nang*.—1 m., cross river to left (W.) bank. Stream enters river from E. Its valley leads up to a bare mountain 800 feet high. Slopes of 30°, 300 feet high, close to river on both sides, with oaks and pines; pines and briars in valley. 1.2 m., slopes on both sides 20°, 300 feet high, with dead pines and poplars on right bank, oaks on left bank. Cross stream from W. Ruins. 1.8 m., on left bank, a grassy opening in the forest, about 200 yards square; gooseberries and currants. Slopes 40°, with oaks and dead pines. Cross stream from W. 2 m., stream enters river from E. Its valley leads up to a bare peak 1000 feet high. Slopes down to river 30°; pines. 2.5 m., cross stream from W. Hills on right bank 300 feet high, sloping 20°, with pines. On left bank a grassy opening about 200 yards square. Pines and yews in valley. 2.7 m., cross river to right (E.) bank. On left bank, another grassy opening, 200 yards square; hills 200 feet high, sloping 20°, with pines and poplars. Cross stream from E. 3.2 m., altitude 14,109 feet. Cross stream from E. Rhododendrons commence. Road from Tsa-Leh to this point pretty good; it now gets stony. 3.4 m., stream enters river from S.W. 3.7 m., stream enters river from S.E. Its valley, which is open, and bounded by slopes of 15°, runs up to a very remarkable rugged peak. On right bank is a ridge 600 feet high, sloping 15°, bare at top, grassy half-way up, and yews below. On left bank a peak 900 feet high, sloping 25°, with oaks and pines. Road ascends right bank of stream, and at 4.2 m. crosses it. 4.4 m., altitude 14,651 feet. Zigzag commences. 4.6 m., no more oaks and pines; yellow flowers and rhododendron on slopes on both sides of road. Very rugged peaks and pinnacles to W., 400 feet high, rhododendron on slopes below. 5 m., end of zigzag. Road 100 feet above stream. A very bare ridge with rugged top, to left of road, 300 feet above it. Very rugged peaks all around. 5.6 m., road crosses the river (dry), which runs from a very rugged ridge 1 m. distant, 400 feet above. The road has been bad since 3.2 m.; it now ascends by a steep zigzag to 6.4 m., summit—Tsa-Leh-La-Ka, altitude 15,788 feet. A rugged and bare ridge, no higher than the pass, runs S.E. and N.W. Water parting between the Chin-Sha-Chiang and the Lan-Ts'ang-Chiang; and boundary between Bat'ang and Yün-Nan. Road descends by an exceedingly bad and steep zigzag, very rocky, between steep crags on both sides. 7.3 m., altitude 14,935 feet. End of zigzag; road descends stream on left (E.) bank. Slopes 10°, covered with rhododendron, and a shrub like box. The zigzags on both sides of the mountain are on almost bare crags, nothing but a little grass, and a few wild flowers. 8 m., altitude 14,523 feet; gooseberries and currants. 8.3 m., stream enters river from W. A ruined hut, Jieh-Kang-Sung-Doh. On right bank, a spur runs down from rugged peak 800 feet high. A little, open, grassy space here; yews on the spur. On left bank, hills 200 feet high, sloping 30°; oaks. 9 m., cross stream from E. A shrub like tamarisk, with small black berries. Road from 8.3 m. very bad indeed. 9.4 m., a little grassy opening on both sides. Stream enters river from S.W. From Jieh-Kang, the stream descends in a valley, with pine-forest on each side, and at the



bottom. The mountains are all about 1000 feet above the stream, they are bare or grassy at the top, and the pine-forest commences about half-way down. The slopes are about  $20^{\circ}$ . 9.7 m. cross stream from N.E. 10.4 m., cross stream from S.E. 11 m., stream enters river from S.W. 11.4 m., stream enters river from S.W. 11.7 m., cross stream from N.E. 11.9 m., stream enters river from S.W. 12.1 m., cliffs on right bank 100 feet high. Road still through dense pine-forest, very bad and rocky; now 200 feet above stream. 12.5 m., a little grassy opening, with a little grass in the bottom of a valley, with a stream from E.N.E.; the same dense pine-forest. Hills on right bank of river 1000 feet high, sloping  $30^{\circ}$ . This place is called Lûng-Zûng-Nang, altitude 12,684 feet; no houses here, or since leaving Tsa-Leh. Road very bad and stony from bottom of zigzag. Rocks, sandstone, friable slaty shale and mica.

5th.—Lûng-Zûng-Nang to A-Tun-Tzû.—Road descending river. 1 m., altitude 12,207 feet; very small bamboo and rhododendron. 1.2 m., hills on both sides 500 feet high, sloping  $60^{\circ}$  to  $70^{\circ}$ . A pine-forest. Road bad. 1.3 m., stream enters river from S.W. A very remarkable bluff marks entrance to gorge. Cliffs on both sides 300 feet high; angle subtended by tops of cliffs on both sides  $15^{\circ}$ . 2 m., cross river to right (w.) bank. Cliffs on both sides 400 feet high, with grass and trees in crevices. 2.3 m., a very small stream enters river from E. Slopes on left bank  $70^{\circ}$ . Cliffs on right bank 400 feet high. 2.6 m., on right bank, cliffs 400 feet high; on left bank, slopes  $80^{\circ}$  with dense foliage. 2.8 m., cross river to left (E.) bank; recross to right bank almost immediately. Cliffs on right bank 500 feet high. 3.4 m., cross stream from W. On left bank, slopes  $70^{\circ}$ , with pines and light foliage. Road up to this point exceedingly bad; better beyond. 3.6 m., slopes  $40^{\circ}$  on both sides. The gorge ends here suddenly. 3.8 m., valley of river 50 yards wide, quite flat, with grass and fine trees. 4.2 m., cross river to left (E.) bank. Slopes on both sides  $60^{\circ}$ , with oaks. Valley closes again. Road is fair and rises above river. 4.6 m., slopes on both sides  $40^{\circ}$ ; a dense oak-forest, with very fine trees on right bank. Road fair. 4.9 m., stream enters river from W. Road 200 feet above river, on top of a spur dividing two streams of equal size, about  $\frac{1}{2}$  mile apart; it then descends right bank of eastern stream. 6 m., on left bank, hills 300 feet above river, sloping  $30^{\circ}$ ; oaks, with grass in patches. 6.2 m., road 200 feet above river; slopes above and below  $40^{\circ}$ ; oak. 6.4 m., altitude 10,698 feet; passion-flowers. 7.1 m., confluence of the two rivers. Road crosses western stream and descends on right (w.) bank. A hut on left bank, with cultivation. Stream enters river from E. 7.6 m., hills on left bank 400 feet high, sloping  $30^{\circ}$ ; very green low jungle, with pines at top. Road 20 feet above river. Ruined shed. 7.8 m., on right bank, slopes  $40^{\circ}$ , with oaks and pines. Road up to this point, fair; it is now along side of steep slope, very narrow, and dangerous in places. 8 m., plum-trees. Road 300 feet above river. Pony slipped off path, rolled down to river, and was killed. 8.2 m., slopes  $60^{\circ}$  on right bank, with grass and scrub, and a few oaks. 8.3 m., cross stream from N.W. Cross spur to another river from N.W., which runs between precipices; descend to it by a steep zigzag. 9 m., cross stream from S.W., by a good bridge to right bank; altitude 9988 feet. Beyond this, road is dangerous in places as before. 9.6 m., the stream joins river on its right bank; stream enters river from S. Road 300 feet above river. The valley now opens; a complete change in scene and climate. Slopes  $40^{\circ}$  on both sides, with cultivation in terraces, in the hollows; slopes covered with grass only; pines at top. Houses among the cultivation. 10 m., stream enters river from S.E. 10.3 m., cross stream from N.W. 10.8 m., cross stream from N.W. 11.3 m., cross stream from S.W. 11.7 m., stream enters river from S.E. 12 m., cross stream from N.W. 12.4 m., stream enters river from S.E. Slopes on both sides 1000 feet high, with grass and shrubs; pines at top. Road still 300 feet above the river, and very fair. 12.7 m., cross stream

from w.s.w. 13 m., granite. Road at river-level. 13·8 m., altitude 9000 feet. Walnut-trees in great quantities. 14·5 m., cross stream from w.; stream enters river from E. 15 m., Dong, altitude 9000 feet. It is situated at end of open valley that commences at 9·6 m. In this valley there is a considerable cultivation of wheat, barley, and buckwheat—a few stalks of Indian corn in a garden—also much sago. Cross stream from w. 15·1 m., stream enters river from E.S.E. 15·5 m., red clay deposit. 16 m., cross river to left (E.) bank. Road leaves river and crosses over a spur to a tributary which it ascends, from 17 m. A gently sloping point between road and river, well cultivated in terraces; with a village in fork of rivers. Above road, rocky and craggy slopes. To N.W. a mountain 1500 feet high, sloping 20°; cultivation in patches on the slopes, but mostly thin grass, with rock showing through. 16·6 m., road from Dong up to this point good, but now rather bad. 17 m., cross stream from E. Hills on right bank covered with juniper. Road rather bad. 17·3 m., on right bank, slopes very steep and craggy; on left bank, precipices 300 feet high with pines at top. A very bad ascent commences, almost a staircase, that lasts about  $\frac{1}{2}$  mile. 17·6 m., on right bank, slopes very broken and craggy; on left bank, cliffs 300 feet high. Road still steep and bad. 17·8 m., cross stream from N.E. 18·1 stream enters river from S. 18·2 m., cross river to left (S.W.) bank. Firs and oaks on slopes on right bank. On left bank, hills 300 feet high, sloping 50°; oaks. 18·5 m., another very bad bit of road—almost a staircase, till 18·8 m., when it improves, but is still bad. 19·1 m., hills on both sides, 400 feet high, sloping 40°. A grassy opening on left bank, and a hut. Road better. 19·5 m., road very good; another grassy opening commences. 19·8 m., precipices on left bank. 20 m., hills on right bank, 400 feet high, sloping 30°; on left bank, hills 200 feet high, sloping 40°; oaks. Cross stream from S.W. Ruined shed on right of road. 20·5 m., grassy opening ends. 20·7 m., cross stream from W.; stream enters river from N.E. 20·9 m., cross stream from W. On left bank, a little, sharp, narrow spur, 100 feet high, projects into the valley; then beyond this is barley and wheat round a house. On right bank, hills 400 feet high, sloping 30°. 21·2 m., source of river. 21·3 m., a water-parting, altitude 12,049 feet. A valley runs down to S.E. 21·5 m., summit—Jo-La-Ka, altitude 12,389 feet. Road for last two miles, up to the water-parting, very good indeed; the last bit of the ascent rather steeper, but good. Beyond the summit the road descends very steeply down a slippery slope; there is a little zigzag. 22 m., altitude 11,879 feet. Barley and wheat round a hut. Very rugged crags above the slopes. 22·4 m., A-Tun-Tzü, or N'geu (Tibetan), altitude 11,029 feet. Hills on both sides 500 feet high, sloping 20°. Green shrubs in valley; wheat, barley, buckwheat. Road from Lung-Zung-Nang to A-Tun-Tzü very bad nearly all the way except the last few miles.

Ka-Wa or Ka-Bo is the Tibetan name for a mountain near A-Tun-Tzü; the Chinese name is Pai-Yo-Shan (White Medicine Mountain). This is a sacred mountain to which pilgrimages are made. A mountain called by the Tibetans N'geu-La-Ka, and by the Chinese Pai-Ma-Shan (White Horse Mountain) or Pai-Na-Shan (the mountain that brings whiteness), has four spurs, called Jing-Go-La, Pa-Ma-La, Mien-Chu-La, and Shwo-La. The name of one of the ridges, Pa-Ma-La, has probably been interpreted by the Chinese into Pai-Ma-Shan, or Pai-Na-Shan. The collective name is often applied to the individual spurs, and there is a good deal of confusion about the nomenclature.

9th.—A-Tun-Tzü to Deung-Do-Lin-Ssü.—Road descends left (N.E.) bank of a small stream. 1 m., stream enters from S.W.; cross stream from N.E. Road leaves river and ascends right (N.E.) bank of a tributary. 2·4 m., oaks, pines, rhododendrons. 3·3 m., summit—Jing-Go-La, altitude 12,300 feet. Source of stream. Road good from A-Tun-Tzü to this point. It now follows the contour of the hill, and descends to 3·6 m., the source of a stream flowing S.E.



4.5 m., oaks, pines, rhododendrons. Road fair. 4.9 m., cross stream flowing s.w. 5.1 m., cross stream flowing w. 5.4 m., cross stream from E. Road then descends to its confluence with a river, and ascends right (N.E.) bank of the latter. 6.6 m., guard-hut. Grassy opening. Cross stream from N.E. 7.6 m., cross stream from N.E. 9 m., guard-hut called Pung-Gien-Tiyin (soldiers were formerly kept here to carry letters and despatches). 9.4 m., cross river to left (w.) bank. Stream enters river from E. Road from Jing-Go-La to this point, very good; it here becomes rather stony. 10.6 m., cross river to right bank; streams enter from s.e. and s.w. Very stony road, but not difficult; pines, oaks, and rhododendrons all the way. 11.3 m., source of river. 11.5 m., summit—Pa-Ma-La, altitude 14,307 feet. A little zigzag to summit, not at all bad. Snow close. Road now very good. Pine-forest. 11.8 m., source of stream flowing s.e. Road descends on left (N.E.) bank. 12.9 m., cross stream from N.E. 14.6 m., road leaves stream, which flows to s. 15 m., summit—Mien-Chu-La, altitude 14,227 feet. From Pa-Ma-La to Mien-Chu-La the road is good. 16 m., cross stream flowing s. 17.6 m., summit—Shwo-La, altitude 14,307 feet. From Mien-Chu-La to this point the road is good, through open country. The descent from Shwo-La is bad and stony to 19 m., where a pine-forest commences. 18.2 m., source of river flowing s.e.; road descends left bank. 19.7 m., cross stream from N.E. 22 m., house on left of road. Cultivation begins. 23 m., a road runs off to E. 23.5 m., cross river to right (s.w.) bank. 29.5 m., Deung-Do-Lin-Ssü or Tung-Chu-Ling; altitude 9335 feet. This village is 200 feet above the river. Walnuts, peaches, buckwheat, barley, sago, and a few stalks of Indian corn in a garden. Hills about 1000 feet high, with pines at top; rather bare slopes; a few trees and small shrubs on them. Low down a few patches of cultivation, where slopes are not too steep. A cut in the hills, on bearing 38°. Valley runs down on bearing 90°, and is blocked by a high, bare and steep mountain; it is enclosed by slopes of 30°, 2000 feet high, cultivated in patches, with pines at top. Upper valley bears 300°, with pine-clad slopes of 30°, 1000 feet high. Lamassery, on bearing 160°, on crest of spur, with pine slopes on hills above it. Road good from 19 m. to Deung-Do-Lin-Ssü.

11th.—*Deung-Do-Lin-Ssü to Sha-Lu.*—Road runs up a valley, nearly following contour of hill by an easy zigzag; very good. 8 m., cross stream from w., nearly at level of main stream. Road then ascends again. Rocks, friable sandstone, quartz, and red clay. 9 m., house. Road now turns E. 1.6 m., Lamassery on right of road, 400 feet above stream. 2.4 m., road 300 feet above river; slopes below 30° down to river, with spurs, flat-topped and cultivated. Hills rise 1700 feet above road, sloping 30°. 2.7 m., road descends very slightly to 3 m., where it crosses a stream from s., and rises again a little on the other side; it is still very good. 3.7 m., point, with ruins; one occupied. 3.9 m., houses; sago, barley, and pears. 5 m., detached houses. Much cultivation on the slopes below the road. Slopes above the road, 1500 feet, rather bare, with yews and shrubs; pines at top. River 1 m. distant, to N. 5.7 m., cross stream from s.s.w. 6.5 m., cross stream from s.s.w. House. 7.4 m., cross stream from s.s.w. Village on right of road. 7.5 m., a water-parting. A very bare mountain to N.E., about 2500 feet above river, which flows to N.E. between very bare sandstone slopes of 60°, leaving no plain at bottom. 7.6 m., source of stream, flowing s.e.; road descends on right (s.w.) bank; road a little rocky. 8.3 m., road leaves valley of stream, which has cut its way here 20 or 30 feet through a deposit of sand and stones. Road now very good, nearly following the contour. 8.8 m., stream joins river from s., and flows to E., in a valley 2 miles long and  $\frac{1}{4}$  mile wide, into the Chin-Sha-Chiang. Valley all cultivated; it has five villages in it; a large one on point of spur, near the confluence, some 60 or 100 feet above the river, is called Pong-Dze-Lan. The N. side of the valley is a long bare ridge, 150 feet high; a spur from the mountain mentioned at 7.5 m. To the E., beyond the Chin-

Sha-Chiang, is another great, bare mountain. Road now ascends the river on left (w.) bank. Bare slopes to w. of  $60^\circ$ , 1000 feet high. 10.2 m., road 150 feet above stream; bare slopes above and below road of  $60^\circ$ . On right bank, slopes of  $60^\circ$ , 500 feet high, nearly bare. Rocks, slaty shale, striking n. and s. 10.7 m., village, with cultivation round it. 11 m., rocky slopes on both sides; a little buckwheat down below. 11.2 m., cross stream from w.s.w. It runs through a short gorge with cliffs 50 feet high, and forms a waterfall. 11.4 m., cross river to right (e.) bank. Slopes on both sides covered with brushwood. Road up to this point very good. 11.6 m., road rather stony, through a jungle of briars. Hills on both sides slope right down to stream, leaving no plain at bottom. 11.8 m., cross stream from e. 11.9 m., cross river to left (w.) bank. 12.3 m., road very good. Cross and re-cross river. 12.6 m., cross river to right (e.) bank. 12.8 m., a short zigzag up to 13 m., village of Sha-Lu, 10 families; altitude, 9287 feet. This village contains the house of a native Tu-Sü, whose name is Wong. His rank is that of a Tuh-Chien-Tsung, and his rule extends over Deung-Do-Lin-Sü, and Pong-Dze-Lah.

13th.—*Sha-Lu to Ka-Ri*.—Road crosses river almost immediately after leaving Sha-Lu, and ascends left (w.) bank. .3 m., on right bank, slopes  $50^\circ$ , with thorns, holly-leaved oaks and briars; on left bank, broken cliffs, with thorns, holly-leaved oaks, and pines above. .5 m., thorns in bed of stream; a steep ascent but good. .7 m., stream enters river from e.s.e.; it flows between cliffs. .9 m., red clay, and red sandstone. 1 m., stream enters river from e.s.e. Road through a dense wood of briars, poplars and peaches. 1.7 m., slopes  $60^\circ$ , with poplars on both sides. 2.5 m., on right bank, hills 200 feet high, sloping  $30^\circ$ , with holly-leaved oaks and poplars; left bank is steep and craggy, with holly-leaved oaks, poplars and small pines. 2.6 m., road very steep. Stream enters river from s.e. 3 m., road through a very thick wood. 3.1 m., cross large stream from w.s.w. 3.4 m., a grassy opening about 200 yards square. On right bank, hills 300 feet high, sloping  $40^\circ$ , with poplars; on left bank, hills 300 feet high, sloping  $20^\circ$ , with holly-leaved oaks, and pines. Road from Sha-Lu up to this point steep, but good. 3.6 m., cross river to right bank. 3.9 m., cross river to left bank. Another grassy opening 200 yards square; rhododendrons and strawberries. Road stony for a short distance. 4.5 m., altitude 11,445 feet. Road very stony, through a dense forest of pines and rhododendrons 20 feet high. 5 m., altitude 11,924 feet; some bamboo. Road begins to zigzag through a dense forest. 6 m., source of river. Forest less dense. Hills 900 feet high, sloping  $20^\circ$ , with pines and grass at top. 6.5 m., summit—Jing-Go-La, altitude 13,699 feet; the road up to this point has been steep all the way, but generally good, and through a dense forest. The slopes on each side come right down to the stream, leaving no plain anywhere; the river runs through a jungle of hazels, briars, peaches, and small trees. Looking s., a stream runs through another valley, also covered with dense pine-forest. The sides of the valley run right down to the stream at an angle of  $30^\circ$ , leaving no plain at the bottom. To the e. is a ridge of crags and pinnacles; summit grassy, with dwarf rhododendrons. To the w. is a sharp peak. 7 m., source of stream flowing s.s.e. 7.8 m., red clay and sandstone on left bank; yellow sandstone and shale with quartz on right bank. 9 m., altitude 11,907 feet. First bamboo, very small. 10 m., stream enters river from n.w. 11 m., the slopes end here in a precipitous point. From Jing-Go-La, the road zigzags through a forest so dense that nothing can be seen in any direction, crossing the stream many times, and is very bad, steep and stony. The lower slopes of the valley are apparently very steep,  $60^\circ$  to  $70^\circ$ . 11.7 m., a wood-cutter's hut, altitude 10,475 feet. The road improves here, and is very fair all the rest of the way to Ka-Ri. It still goes through the same dense wood of holly-leaved oaks and pines, with briars, hazels, and blackberries. 12 m., stream enters river from w. 13 m., Ka-Ri, altitude



9610 feet; a village of 4 families only. There is a little buckwheat here in the open valley, and some fine cabbages are grown in the gardens. Hills on both sides 500 feet high, sloping  $30^\circ$ , with holly-leaved oak, true oak, walnuts, hazels, and pines (rather thin). A large stream enters river from N.E.

14th.—*Ka-Ri to N'doh-Sung*.—Road descends river on left (E.) bank. .6 m., cross stream from E.S.E. .9 m., cross stream from S.E. Road, which is 100 feet above stream, very good up to this point. 1.2 m., cross stream from S.E.; house. 1.7 m., village. Road leaves river, which flows into the Chiu-Chü, 1 m. S.; its valley opens out as it approaches the confluence; houses and cultivation at the bottom. 2.3 m., road crosses over a spur, and is still very good; yellow sandstone. 2.8 m., road descends by a zigzag to 3.2 m., where it reaches the Chiu-Chü, on left (N.E.) bank, and is again very good. 3.4 m., altitude 8226 feet. River runs through a gorge; cliffs on both sides 200 feet high, with holly-leaved oak in crevices. In the valley are plums, walnuts, barberries, and briars. River about 30 yards wide. 4 m., on both sides are cliffs and precipices, covered with trees in the crevices. 4.3 m., wooded cliffs on both sides. 4.6 m., cross river (16 yards wide) to right (S.W.) bank, by spar-bridge. 4.8 m., stream enters river from N.E. There are houses at the entrance of its valley; beyond are cliffs 700 feet high. On right bank, slopes  $70^\circ$ , covered with holly-leaved oak. A thick wood of thorns, barberries, and poplars in the valley. 5.2 m., a spur on left bank, 200 feet high, sloping  $50^\circ$ , with holly-leaved oak. On right bank, hills 400 feet high, sloping  $40^\circ$ , with holly-leaved oak. Yellow plums in the valley. 5.4 m., cross stream from S.W., which runs through a narrow, precipitous gorge. The river is now bounded by cliffs on right bank. On left bank, are spurs 200 feet high, sloping  $30^\circ$ , from a mountain 3000 feet high; brushwood. Road begins to rise up side of slope. Valley is flat, 200 yards wide, and cultivated with buckwheat. From Ka-Ri to this point no flat in valley, hills running straight down to water. 6 m., cross stream from S.W.; stream enters river from N.E. On left bank, a hollow, basin-like valley, well cultivated, running up to a peak to N.E. Houses in valley; Indian corn in gardens. 6.4 m., cliffs on left bank. Houses on right bank; sago and Indian corn in gardens, and Hung-Pai (a grain something like rice). Road at river-level. A grassy plain 500 yards long, 100 yards broad, between river and hills. River then runs through a narrow gorge bounded by cliffs. 6.6 m., cross stream from S.W. 7.1 m., crags and steep slopes, 1000 feet high on both sides, covered with grass and trees. 7.4 m., altitude 7806 feet. Stream enters river from N.E. Cliffs and slopes 500 feet high, on both sides. Passion-flowers. 8 m., a small grassy plain on left bank. Slopes  $30^\circ$ , with brushwood and grass. 8.4 m., slopes of  $40^\circ$ , 400 feet high on both sides, with cliffs at the top; brushwood. Yellow sandstone. 8.7 m., stream enters river from E., flowing between cliffs. House at its mouth. 9.2 m., stream enters river from E. Cliffs on right bank. 10 m., stream enters river from E.; holly-leaved oak on slopes in its valley. Village of Shieh-Zong (8 families), on left bank; weeping willows about it. Bridge across river. Hills on both sides 1000 feet high, sloping  $50^\circ$  on left, and  $40^\circ$  on right bank; holly-leaved oak and poplars, with pines at the top. A little plain below, 500 yards long. 10.8 m., cross stream from W. 11.2 m., cross large stream from W. Cliffs bound the river on right bank. On left bank, slopes  $40^\circ$ , covered with holly-leaved oak. A small flat at bottom of slopes; hazel-nuts. 11.8 m., cross stream from S.W. Road passes alongside of cliff, 100 feet above river; it then descends to 12.2 m., by rather steep zigzags to an important stream from S.W., crossed by a bridge. Yellow sandstone. Precipices on right bank. 12.5 m., cross the Chiu-Chü, which is 16 yards wide, to left (E.) bank, by spar bridge. First Indian corn in a field. Stream enters river from N.E. 12.6 m., village of N'doh-Sung, altitude 7417 feet (6 families). House belonged to native officer of district, with rank of Thuh-Pa-Tsung. On right bank, hills 300 feet high, sloping  $60^\circ$ , broken with cliffs, and

densely wooded with holly-leaved oaks and poplars; a flat at bottom 100 yards broad, with buckwheat and Indian corn. On left bank, hills 300 feet high, sloping  $30^{\circ}$ , with holly-leaved oak; a flat, 100 yards broad, at bottom, close to river, with sago.

15th.—*N'doh-Sung to Ron-Sha*, descending the Chiu-Chü on right (w.) bank.—5 m., end of flat ground by river; slopes come right down to water. Road through a wood of oaks, holly-leaved oaks, shrubs, and a few firs. 1.1 m., on both sides, slopes  $60^{\circ}$ , broken with cliffs and crags; holly-leaved oak growing thickly on them. 2 m., precipitous slopes on both sides, with holly-leaved oak and firs. 2.4 m., on right bank, slopes  $70^{\circ}$ , broken with crags; holly-leaved oak. On left bank, hills 1000 feet high, sloping  $30^{\circ}$ ; pines nearly to bottom. Rocks, shale, and sandstone. 3 m., cross stream from s.w. 3.3 m., on right bank, a flat, grassy opening, 200 yards by 60 yards, with pines, rhododendrons, and very large true oaks. Slopes  $40^{\circ}$  on both sides. 3.9 m., cross stream from s.w. Cliffs on right bank. 4.1 m., cross stream from s.w. 4.3 m., flat ground, 100 yards wide, begins in valley; buckwheat. 4.6 m., stream enters river from s.e. Road 100 feet above river. 5 m., cross stream from s.w.; a little grassy opening in its valley, and many walnuts; buckwheat for  $\frac{1}{2}$  mile up it. 5.3 m., bridge over river. 5.6 m., the slopes for a width of 100 yards, at bottom, cultivated with buckwheat and Indian corn on both banks. House. 6.2 m., cultivation ends; hills slope right down to river. 6.5 m., stream enters river from s.e. 6.7 m., houses. Altitude 7261 feet. A kind of rice (M'jeh in Tibetan), sago, and Hung-Pai. 7.2 m., on right bank, a little cultivation on very steep slopes; true rice. On left bank, a flat, cultivated point below the slopes. 7.4 m., a flat, cultivated point on right bank. Great number of walnuts in valley. On left bank, hills 800 feet high, sloping  $30^{\circ}$ ; crags at top, wooded. Road at river-level. 7.7 m., a flat, cultivated point below the slopes on left bank. Bridge across river. Houses on left bank. 8 m., cross stream from s.w. A flat, cultivated point below the slopes on right bank. House. 8.5 m., cross stream from s.w., flowing between precipices. Stream enters river from s.e. Hills on both sides 1000 feet high, sloping  $30^{\circ}$ , with crags at top; pines, holly-leaved oak, and small trees; bare rock between the pines; no grass. 9.3 m., cross stream from s.w. 10.5 m., Sa-Ka-Tying, a village of 3 or 4 families; altitude 7075 feet. Stream enters river from s.e. Its valley runs up to a peak 1500 feet high, with cliffs on top; pines on slopes. Road from N'doh-Sung, everywhere very good. There has generally been a flat space, cultivated, at all the points on each side of the river. Hung-Pai is a grain, of which there is a good deal in this valley; English name unknown. The grain is about the size of sago, and red when ripe; it is ground into flour. 11.5 m., cross stream from w. 12.1 m., flat at bottom, 200 yards wide. 12.3 m., bridge across river. 12.4 m., house. A flat space between road and river for 1 mile. 13.1 m., house. Hills on left bank, 500 feet high; wooded, with cliffs at top. 13.3 m., cross large stream from s.w. House. Pomegranates and persimmons. 13.5 m., houses. 14 m., on right bank, steep and craggy slopes; on left bank, hills 800 feet high, sloping  $30^{\circ}$ ; pines at top, grass below. 14.6 m., village on left bank, on a flat point projecting into river below the slopes. Bridge across river. 14.8 m., cross river Kung-Chü from s.w. by bridge. Village at entrance of valley, which is  $\frac{1}{2}$  mile wide, and flat. The valley is cultivated; the hills which bound it on the s., end in a long rocky spur. 15.4 m., houses. Slopes  $60^{\circ}$ , broken with cliffs, on right bank. 15.7 m., rocks and cliffs 800 feet high, on left bank; on right bank, slopes  $50^{\circ}$ , 800 feet high. No cultivation in valley. Road through a jungle of briars. 16 m., on right bank, slopes of  $70^{\circ}$ , broken with cliffs, and wooded; high precipices on left bank. Road through a dense jungle of thorns and small trees. 16.2 m., on left bank, slopes of  $60^{\circ}$ , with cliffs at top. A little cultivated flat at bottom on right bank. 16.4 m., village on left bank, on a flat, culti-



vated point at bottom of slopes; hills sloping  $70^{\circ}$ , broken with cliffs, and wooded. On right bank precipices and slopes  $70^{\circ}$ , wooded. River divided into several channels by islands. 17.1 m., a rocky spur runs out 200 yards beyond the road. Slopes on left bank  $70^{\circ}$ ; wooded. Rocks, sandstone and shales. 17.6 m., Ron-Sha, altitude 6916 feet, a village of 12 families. Hills to s. 1000 feet high, sloping  $20^{\circ}$ , with low thorns and brushwood. Grassy valley 150 yards wide; buckwheat and sago. Road from N'doh-Sung very good.

16th.—*Ron-Sha to La-Pu or Ta-Chio.*—Road leaves the Chiu-Chü, which flows to E., and ascends left (w.) bank of a tributary, in the valley of which rice is cultivated. .4 m., valley closes in, the hills sloping right down to the water, on both sides. .8 m., on right bank, slopes  $30^{\circ}$ , with a little buckwheat on them, above which is a dense wood of firs and holly-leaved oaks; on left bank, slopes covered with firs, walnuts, and holly-leaved oaks. 1.1 m., road open up to this point. It now enters a dense wood of pines, oaks, holly-leaved oaks, chestnuts, and rhododendrons, and ascends for  $\frac{1}{2}$  mile by a short zigzag. 1.5 m., cross river to right (E.) bank; stream enters from s.w. Slopes  $40^{\circ}$  on both sides, covered with dense forests of pine and holly-leaved oak. Hills on left bank, slope sharply down to water. Road through dense wood. A small uncultivated bamboo here. 2.4 m., road 60 feet above river. Cross stream from N.E. 3 m., cross stream from N.E. On right bank, hills with bare cliffs at top, from which spurs, sloping  $30^{\circ}$ , are thrown out to river; on left bank, slopes of  $40^{\circ}$ , with pines and holly-leaved oak. 3.2 m., cross stream from E.N.E. A house in a little opening in the thick wood. 3.4 m., altitude 8436 feet. On left bank, slopes  $10^{\circ}$ , cultivated with buckwheat. A house. Green and yellow sandstone, and quartz, striking s. by E. 3.5 m., cross stream from E. Cross river to left (w.) bank. Road from Ron-Sha to this point very good, but steep; steep zigzag now to 4 m. Soil sticky, yellow clay. 4 m., an opening in the wood, with a house. Above the road are slopes  $15^{\circ}$ , with buckwheat; below, the hills slope  $40^{\circ}$  to river, and are densely wooded. 4.4 m., village, altitude 9157 feet; on a plateau, cultivated with buckwheat and flax; wooded slopes below  $60^{\circ}$  down to river; above it are pine-covered hills, sloping  $20^{\circ}$ . On right bank, slopes  $25^{\circ}$  up to hills 300 feet above road, which is on left bank. These slopes are covered with pines and holly-leaved oaks, but not very thickly; there are a few patches of cultivation; the lower slopes,  $60^{\circ}$ , end in precipices just above the river. 5 m., cross stream from w. On right bank of river, hills 400 feet, sloping  $30^{\circ}$ , with patches of pines and open grass. On left bank a grassy plateau, slopes below  $40^{\circ}$  down to river; the hills above it slope  $20^{\circ}$ . They are covered with pine, and have cliffs at the top. 5.5 m., cross stream from s.s.w. 5.6 m., road between two streams, over a grassy plain 200 yards long and 50 yards wide, bounded by densely-wooded hills 200 feet high, sloping  $20^{\circ}$ . 6.1 m., altitude 10,381 feet. Road, which is getting very steep, enters a dense wood. Trees have long pendants of moss hanging from the branches. Rhododendrons. 6.3 m., cross river to right (E.) bank. 6.7 m., source of river; altitude 11,657 feet. Strawberries, currants, and small bamboo. Road rocky and bad. A very bad steep zigzag commences, which lasts till summit is reached. 7.4 m., summit—Küng-Geh-La-Ka, also called Püng-Geh-La-Ka, altitude 12,134 feet. Road now descends to s.s.e. by a steep, rocky, and very difficult zigzag. During the march a thick mist hid everything, and it was pouring with rain, so that little was seen, and note-taking was almost impossible. The road was through a dense forest of pines, holly-leaved oaks, currants, and other bushes, some of the pines being of extraordinary large dimensions; it zigzagged apparently down a spur, but the mist was so thick that it was impossible to say for certain that it did. 9.7 m., source of stream on right of road; road descends left (E.) bank. 10.4 m., hut; first cultivation, buckwheat. Hills on right bank, 300 feet

high, sloping  $40^\circ$ ; dense pine-forest. 12.2 m., on both sides, pine-covered hills 1000 feet high, sloping on right bank  $40^\circ$ , and on left bank  $50^\circ$ , broken with rocks and cliffs. A remarkable bluff on right bank. 12.8 m., cross stream to right (w.) bank. A stony valley; the trees in it are covered with mud, and have stones among their branches to a height of 6 or 7 feet, showing that the stream must, at times, become a swollen torrent of very large dimensions. Some fields under water for rice cultivation. Red clay and red sandstone. 13.2 m., village of Shio-Gung (Tibetan), called by the Chinese, Hsia-La-Pu. There are 25 families, and a hereditary chief, whose title is "Mu-Kwa." (This is the "Moquor" of Cooper, but "Mu-Kwa" is not the name of a tribe.) 13.3 m., cross stream to left (e.) bank. Road turns to e., and descends a tributary of the Chin-Sha-Chiang on left (s.) bank. 13.5 m., altitude 7117 feet. Road passes through a wood of large holly-leaved oaks, 100 feet above the river, into which the stream here falls. Rice cultivation in valley below. 14 m., valley  $\frac{1}{2}$  mile wide, and cultivated with rice. On right bank, hills sloping  $60^\circ$ , with pines; on left bank, pine-covered hills, sloping  $40^\circ$ , with cliffs at top. 14.4 m., cross stream from n., with an open valley. A spur on right bank of river, 200 feet high, sloping  $40^\circ$ , covered with small shrubs. Chestnuts, walnuts, and persimmons. 14.7 m., a wooded peak, 1000 feet high, sloping  $40^\circ$ , on right bank. Buckwheat. 15.2 m., village of Ta-Chio, called by the Chinese, La-Pu, altitude 6777 feet; 30 families. There are four native officers called "Mu-Kwa," and a Chinese officer, called "Hsui-Kwan," whose rank is that of a "Wai-Wai." His district extends from Shio-Gung to Jie-Bu-Ti. River 10 yards wide.

17th.—*Ta-Chio to Lu-Jiong or Wai-Ta-Chen.*—Road returns from Ta-Chio for  $\frac{1}{2}$  mile, then crosses river to right (s.) bank, and descends it on that side to its confluence with the Chin-Sha-Chiang. 6 m., wooded hill to s., 1000 feet high, sloping  $30^\circ$ . Valley of main stream is  $\frac{1}{2}$  mile wide, and flat. A small open valley, laid out in rice terraces, runs up to n. Buckwheat and many walnuts. 8 m., cross stream from s.s.w. On left bank, wooded hills of red clay and sand, 800 feet high, sloping  $30^\circ$ . 1.2 m., valley,  $\frac{1}{2}$  mile wide, quite flat. Hills run sharply down on both sides. 1.5 m., stream enters river from s.e.; an open entrance to its valley, with rice flats in it. In front of this valley a very flat point extends to s.w. Hazels and barberries. All hills here are round-topped. 2.1 m., cross stream from s.w.; valley 200 yards broad. A thick wood of holly-leaved oak. On left bank, round smooth hills, 500 feet high, sloping  $20^\circ$ ; pines above. Yellow, friable, shaly sandstone. Village on left bank. 2.8 m., cross stream from s.w.; its valley runs up between hills 800 feet high, sloping  $40^\circ$ ; densely wooded, and crags at top. A village; great numbers of very fine walnuts; beans, pomegranates, pumpkins, Indian-corn, vegetables, persimmons, palms, willows, Hung-Pai, and chestnuts. River sweeps to s.e.; its bank running close to foot of hills,  $\frac{1}{2}$  mile from the road; a cultivated flat between them. 3.3 m., village. Road from Ta-Chio to this point exceedingly good; it is very muddy here. 3.7 m., village. Road close to river, which runs close to foot of hills on n., and is crossed by a spar bridge. Slopes on left bank,  $40^\circ$ , with holly-leaved oak. On right bank, a gently sloping cultivated plain, running up to hills 600 yards distant. 4 m., cross stream from s., flowing through an open valley, the mouth of which is 1 mile wide. Hills  $\frac{1}{2}$  mile distant. 4.6 m., village on left bank of river. Cross stream from s. 4.7 m., a perfectly flat point projects into bend of river. 5.3 m., village. On right bank, hills, sloping  $20^\circ$ , run sharply down to a flat plain 100 yards wide, between them and the river. Shrubs. On left bank, at foot of hills which run sharply down, is a flat plain 100 yards wide. A spur, 200 feet high, sloping  $30^\circ$ , runs parallel to river; pines and bare patches. 5.7 m., temple on left bank, at top of end of spur; village at its foot. 5.9 m., village.



Stream enters river from N. Spar bridge across river. From this point to 6.6 m. is a perfectly flat plain, 200 yards wide, extending from the river on each side to foot of hills, which run sharply down to it. 6.6 m., hills on both sides, slope  $50^\circ$  right down to water; pines. Slaty shale, striking E. and W. 7.4 m., hills on both sides, 500 feet high, sloping  $60^\circ$ , with firs. No flat by river; hills run sharply down to water. 7.8 m., village. Tobacco in a garden. 8 m., a little cultivation on slopes, between road and river. 8.2 m., cross stream from S., flowing in a valley, between densely-wooded hills. 8.4 m., stream enters river from N. Its valley, which has a little cultivation on the slopes at its mouth, runs up to a peak 1500 feet high, with craggy top, and wooded sides. 9 m., on right bank, slopes  $20^\circ$ , with dense forest of pines and holly-leaved oaks. On left bank, slopes run sheer down to river, leaving no flat. Trees not very thick; grass between. 9.3 m., cross stream from S.W., which is bounded by steep and densely-wooded slopes and crags. There is no flat ground here, but there are slopes at the mouth of the valley. Rice and sago on terraces. On left bank, a steep and wooded point projects into the river, leaving no flat. 9.7 m., a precipice 300 feet high, on left bank of river, close down to water. 9.9 m., on right bank very steep slopes, with cliffs half-way up. 10.5 m., on right bank, densely-wooded slopes  $50^\circ$ , with cliffs at top; on left bank, a rocky spur 200 feet high, runs out, with cliffs at top. River here joins the Chin-Sha-Chiang or N'jeh (Tibetan); road descends right (S.W.) bank. 11 m., village of Jie-Bu-Ti (wrongly called Jie-Tein), or Chi-Dzûng (Chinese), altitude 6621 feet; 23 families. It has a Chinese officer called a "Hsui-Kwan," and a native officer called a "Shien-Ngau." Parrots and orange-trees here. The road from Ta-Chio to this place is very good indeed, except 3 or 4 short bits of very stiff mud and clay. The La-Pu district ends at this point. To go to Chung-Tien the Chin-Sha-Chiang is crossed here. 13.4 m., Lu-Jiong-La-Ka (a mountain), altitude about 7000 feet. Road passes over an exceedingly steep and rocky spur, 400 feet high, which ends in a vertical cliff 200 feet, the base of which is washed by the river; and is very bad in wet weather. 13.8 m., cross stream from S.W. Its valley, which runs up to mountains densely-wooded with pines, is wide and open, undulating, with patches of cultivation, grass fields between hedges, shrubs, and small trees. 14.6 m., Lu-Jiong, called by Chinese, Wai-Ta-Chen, altitude 6647 feet; a village of 50 families, within the jurisdiction of Li-Kiang-Fu. There are some of the Mû-Sû people here (called M'ê-L'ê), who have a language not very analogous to the Tibetan. This village is situated at end of a low gently sloping spur,  $\frac{1}{4}$  mile distant from the river. To the S.E. is a mountain, 1500 feet high, sloping  $30^\circ$ , covered with dense pines. It ends in cliffs, the foot of them being swept by the river. The Kwei-Hua tree is met with on the road between Ta-Chio and Lu-Jiong. There are pumpkins and many vegetables in the gardens.

18th.—*Lu-Jiong to Ku-Deu or Chi-Tien*, descending right (W.) bank of the Chin-Sha-Chiang.—After leaving Lu-Jiong, the road crosses a flat to another small spur, which is partly cultivated and partly covered with trees. 1 m., the broad valley ends here, and is bounded by hills sloping  $20^\circ$ . A flat wooded point thrown out from mountain to N. River 80 yards broad. 2.2 m., stream enters river from S.E.; there is scarcely any plain in its valley. On right bank, a spur, sloping  $30^\circ$  down to road, covered with pines. Between road and river is a cultivated flat,  $\frac{1}{4}$  mile wide. 2.5 m., cross stream from S.W.; its valley runs up between pine-clad hills, sloping  $15^\circ$ . Same flat between road and river as before; it is uncultivated, and has big rocks strewn about. 3 m., on right bank hills slope  $70^\circ$ , and are broken with big rocks and small cliffs; holly-leaved oak and grass. Below the slopes, a flat plain, with loose rocks lying about, and a few small trees. On left

bank, a peak 500 feet high, sloping  $30^\circ$ , densely wooded. Road from Lu-Jiong to this point very bad, through deep sticky clay; would be fair in dry weather. It improves here. 4 m., stream enters river from E.; its valley opens out on to a broad flat point. Village on left bank. On right bank, a rocky point projects into river, which sweeps close to foot of it. Road bad. 4.6 m., on left bank, a peak 1000 feet high, sloping  $60^\circ$ , densely wooded; a wooded flat at the bottom. Road close to river through a dense wood of firs. 5 m., road close to river through a jungle of thorns and trees. A flat, cultivated with rice, commences between road and river. 5.4 m., village. 5.6 m., cross stream from S.W. by a covered bridge (the first one). Road runs along the foot of the hills. Between it and the river is a flat,  $\frac{1}{2}$  mile wide, cultivated with millet. 6 m., on right bank, hills 200 feet high, sloping  $20^\circ$ ; pines. Plain below,  $\frac{1}{2}$  mile wide, stony, with thorns. Lower slopes of mountain to N.E.,  $10^\circ$ , wooded. 6.4 m., road ascends a stream from W. a little way, and at 6.6 m., crosses it by covered bridge; altitude 6349 feet. It then rises up to the top of a spur from the mountains, which spur ends in a rocky point, with precipitous sides. At the extremity is a cliff running sheer down to river, which washes its base. 7 m., summit of spur, altitude 6735 feet. Road, which is sandy, now descends by an easy gradient along the side of the hill through a thin wood of small pines. On left bank, still part of mountain to N.E., slopes  $15^\circ$ . 7.4 m., road still on hill-side, above a flat which commences here between hills and river. 7.9 m., cross stream from S.W. Road at bottom. 8.2 m., village. 8.4 m., stream enters river from N.N.E.; a flat and cultivated plain at mouth of its valley. Village on left bank. Road is here  $\frac{1}{2}$  mile from river, and good. Indian corn, millet, and tobacco. 9.7 m., summit of another spur; altitude 6862 feet. Road good. A wood of pines. Soil, red gravel. 10 m., road at bottom of spur. A flat sandy plain, cultivated with millet, beans, and Indian corn. 10.2 m., road 200 yards from foot of hills; good. 10.5 m., cross stream from W. Village of Mu-Khun-Do, called by Chinese Hsia-Ken-To. 10.8 m., road close to river, and very good. Rocky slopes  $20^\circ$ , with pines and holly-leaved oaks. Hills close to road and river. 11 m., a cultivated flat on left bank, with a village and trees. 11.9 m., stream enters river from N.E.; its valley runs up to a peak 1500 feet high, sloping  $30^\circ$ , with pines; lower slopes cultivated. On right bank, hills 1000 feet high, sloping  $15^\circ$ ; pines. Road 300 yards from river, with cultivated flat ground on both sides of it. 12.2 m., road  $\frac{1}{2}$  mile distant from river; a flat between them, with rocks lying about, traversed by a creek. 12.6 m., village. 12.8 m., cross stream from W.S.W. in a wide valley, by covered bridge. On left bank, slopes run right down to river, leaving no plain. 13.3 m., on right bank, a rocky point runs right down to river, and the cultivated flat ends. On left bank, flat ground commences between hills and river. 13.6 m., another cultivated flat, on right bank, by side of river, 200 yards wide, commences; it is separated from road by a creek. 14 m., road  $\frac{1}{2}$  mile from river. 14.5 m., road close to river. Flat ends; hills come right down to river. 15.3 m., stream enters river from N.E., flowing through an open-mouthed and cultivated valley, which is divided into two parts by a pine-clad mountain, 1500 feet high. Road close to river. 15.4 m., hills on right bank, 500 feet high, sloping  $20^\circ$ ; pine clad. Indian corn, Hung-Pai. 15.5 m., village. 15.7 m., cross stream from W.S.W.; its valley, which is open and cultivated, runs up between wooded hills. Stream enters river from E.N.E., flowing through a wooded valley which runs up to a densely-wooded, rocky ridge, 1200 feet high. Rocky spur ends, and a flat commences between road and river. Sandy, stony soil; no rice. Road excellent from Hsia-Ken-To to this point. 15.9 m., village. Road 800 yards from river; a flat between them; no rice. 16.1 m., road close to foot of



hills. Sandy, clayey flat,  $\frac{1}{2}$  mile wide, between it and river; cultivated. Hills slope  $20^\circ$ , with holly-leaved oak and pine. 16.3 m., cross stream from w.s.w.; its valley is closed by a wooded mountain 1000 feet high, sloping  $50^\circ$ . Village, with rice. Road close to river. 17 m., on right bank, a rocky point comes down to, and is washed by the river. Road at foot, close to water's edge; after which the hills recede a little, leaving a hollow basin; cultivated. Stream enters river from E. Its valley runs up to same ridge as at 15.7 m. There are gentle, cultivated slopes at its mouth, where is the first regular Chinese village, with whitewashed walls, and tiled, gabled roofs. A flat commences here between hills and river. 17.8 m., cross stream from w. 18.5 m., cross large stream from w.s.w., flowing through a wide valley. The hills which bound it on s. side, end in many small spurs. Chin-Sha-Chiang here  $\frac{1}{2}$  mile broad, but it is evidently now much above its banks. 18.8 m., village, with tile roofs; the first weeping willows. Road crosses a grassy plain, 1 mile wide. 19.8 m., village of Ku-Deu\* or Chi-Tien (Chinese); altitude 6200 feet. A Wai-Wai stationed here as Hsui-Kwan. Hills  $1\frac{1}{2}$  m. distant, all round. Road between Lu-Jiong and Hsia-Ken-To is indifferent, and in some places very bad, through stiff, deep mud, and clay; between Hsia-Ken-To and Chi-Tien it is very good. The rocks between Lu-Jiong and Chi-Tien are grey and yellow sandstone, clay, sand, and gravel.

20th.—*Chi-Tien to Ts'ü-Kua*, descending right (s.w.) bank of the Chin-Sha-Chiang. The river has overflowed its banks, and here looks like a lake. To the s.e. of Chi-Tien the hills on both sides are 1000 feet above the river, sloping  $40^\circ$ .—8 m., village. Stream enters river from E.N.E., flowing through a very open valley. Cross stream from s.w., flowing through a very open, well-wooded valley. 1.2 m., village. Road at foot of hills, and close to river. 2.1 m., stream enters river from N.E., flowing through a small, open, well-cultivated valley. Hills on left bank, slope  $40^\circ$  down to river; they are covered with grass, and have pines at the top. On right bank, a peak 1000 feet high; hill-sides wooded with pines. 2.6 m., a grassy, thorny plain, 200 yards wide, without cultivation, at foot of hills on right bank. From this point to 4.3 m., a plain,  $\frac{1}{2}$  mile wide, on left bank. 2.8 m., river 100 yards broad. 3.1 m., stream enters river from N.E. Cultivation commences. 3.4 m., village, with Indian corn. 4 m., a walnut-grove. Marshy ground and rice cultivation. 4.2 m., stream enters river from N.E. 4.6 m., cross stream from s.w., flowing between wooded hills. River 150 yards wide. Houses. 4.8 m., a rocky point and precipices on right bank. Slopes covered with holly-leaved oak. 5.2 m., cliffs at edge of river on right bank. 5.5 m., village. Flat ground begins here, between hills and right bank. Hills slope  $40^\circ$ ; pines at top, Indian corn below. On left bank, hills come right down to river. 5.7 m., village on left bank, with walnut-trees and cultivation. Road 150 yards from river. Flat ground,  $\frac{1}{2}$  mile wide. Wooded hills, slope  $30^\circ$ . Houses. Rice, tobacco, and walnuts. Stream enters river from N.E. 6.1 m., a wooded flat. An undulating valley runs up to s. 6.5 m., cultivated flat between road and river. Above the road are thick woods. 6.6 m., cross stream from s. 6.9 m., road over a flat, wooded with oaks, chestnuts, and walnuts. 7.1 m., on right bank, open flat at foot of hills. Indian corn and cultivation on slopes of the very little valley to s. On left bank, a spur, sloping  $20^\circ$ , comes down from the ridge above, wooded with pines. 7.5 m., village. Road 200 yards from river. A wooded flat begins on left bank. 7.8 m., cross very small stream from s.w. Road close to river. Wooded hills slope  $40^\circ$  right down to stream. Cultivation on slopes on left bank. Stream enters river from N.E. 8.2 m., road through a wood, and close to river. 9 m., a rocky and precipitous point on right bank. Road through a wood after passing this point.

\* Can this be "Kutung," referred to by Baber?

On left bank a wooded spur, sloping  $20^{\circ}$ . 9.5 m., cross stream from s. Hills on right bank, 1000 feet high, sloping  $30^{\circ}$ ; pines and walnuts, and Indian corn. Much jungle and wood between road and river. 9.7 m., rice cultivation. 9.9 m., flat ground extends from the river 1 mile beyond the road. Rice and Indian corn. The spur on left bank comes right down to the river. 10.4 m., village of Pai-Fên-Ch'iang. Stream enters river from n.e. The same long ridge on the n.e., with precipices at the top. The road now rises over a rocky spur 100 feet high, then descends to the river-level, and enters a wood. 11.1 m., flat ground on both sides of river. 11.5 m., road close to river; a wooded flat between it and foot of hills. The same long ridge on the e., 1500 feet above the river. Stream enters river from n.e. 11.9 m., village. Hills come down to river, on left bank. 12.6 m., another flat begins on the e., between hills and river. 12.8 m., rocky point on right bank. 13.1 m., road close to river; another rocky point on right bank. 13.4 m., rocky point on right bank. On left bank, flat ground  $\frac{1}{2}$  mile wide, between hills and river. Road turns up a stream from w., whose valley is  $1\frac{1}{2}$  mile wide at this point, and ascends left (n.) bank. Hills on both sides, 800 feet high, sloping  $50^{\circ}$ . Indian corn. 14.8 m., cross the stream to right bank, by a spar bridge. Road turns to e., and descends right (s.) bank. 15.5 m., village. 16.3 m., village of Ch'iao-T'ou. Confluence of stream with the Chin-Sha-Chiang. Flat ground on left bank,  $\frac{1}{2}$  mile wide, between river and foot of hills. 17 m., large village on left bank. On right bank a wooded point, gently sloping  $15^{\circ}$ , covered with jungle, extends  $\frac{1}{2}$  mile beyond road down to river. 17.4 m., a valley runs to n.e., through which is the road to Chung-Tien. A large stream flows down this valley, whose sides rise to about 1000 feet, and are well wooded. A large village on left bank of stream at its mouth. 17.5 m., road through woods, close to river. 17.8 m., a rocky point on right bank. From this point to 19.3 m., a very gently sloping valley between two spurs, which are ridgy at the top, and are 1500 feet high, sloping  $15^{\circ}$ . This valley is  $1\frac{1}{2}$  mile wide, slightly undulating, partly cultivated, and partly wooded. Road close to river, through an oak wood. 18.3 m., a large village on left bank. A very small, cultivated island in the river. 18.6 m., a small, cultivated, triangular valley, on left bank, sloping up  $7^{\circ}$  or  $8^{\circ}$  to a wood of pines; at the top are rugged peaks. 18.8 m., cross stream from s.w. 19.3 m., for 200 yards on each side of road there is flat ground, cultivated with buckwheat and rice. Above this, on the s.w., a spur rises up, sloping  $20^{\circ}$ . Cultivated slopes on left bank. 19.7 m., road  $\frac{1}{2}$  mile from river. Cross stream from s.w., flowing through a small, triangular valley, cultivated with rice. 20.5 m., village of Tz'u-Kua, altitude 6645 feet; about  $\frac{1}{2}$  mile from river, and a good deal above its level.

21st.—Tz'u-Kua to Shih-Ku, descending right (w.) bank of the Chin-Sha-Chiang.—1.2 m., from Tz'u-Kua to this point the road is above the river level, among rice-fields laid out in terraces. These terraces end here, and the road is 200 yards from, and 50 feet above, river. Hills on this side are covered with pines; spurs slope  $20^{\circ}$ ; valleys,  $40^{\circ}$ . Flat ground  $\frac{1}{2}$  mile wide on left bank, between hills and river. 1.5 m., road enters a wood; cultivation ends. 1.8 m., a small cultivated island in river. Road close to water. 2 m., road close to river. Slaty, friable shale, striking n. and s. 2.4 m., road through a sloping wood close to river. 2.6 m., stream enters river from n.; its valley runs up between red hills, 1000 feet high, covered with pines. The sides of the spurs slope  $20^{\circ}$ , and are much broken. A village on left bank, with cultivation and walnut-trees. A peak to the n., about 3 miles distant. 2.8 m., road 300 yards from river; flat ground, cultivated with Indian corn, between them. 3 m., on right bank, rocky, pine-covered slopes run down close to the road at an angle of  $20^{\circ}$ . 3.6 m., village, with chestnuts and walnuts. On left bank, hills 1000 feet high, sloping  $20^{\circ}$ , come close down



to water; pines. Between this point and 4.7 m. there is flat ground between road and river, partly cultivated and partly stony. 4.3 m., village. Road  $\frac{1}{4}$  mile from river; rice-flat between them. 4.5 m., village on left bank of river. 4.7 m., village. Cross stream from s.w., by covered bridge, with stalls. 5.4 m., road close to river, and at foot of wooded hills. 6.2 m., road close to river; hills wooded and broken. 7.4 m., road 100 yards from river; spur comes down to it. 7.6 m., village. 8.1 m., road close to river. Stream enters river from n.e.; a flat plain extends for 2 miles up its valley. 8.9 m., road close to river. 9.4 m., road close to river. Peak to n.e., 1000 feet high, with cliffs at top; slopes running  $30^\circ$  down to river, leaving no flat at all. 9.9 m., a flat triangle, cultivated with rice, between the spurs on the w. 10.2 m., village of San-Hsien-Ku, altitude 6390 feet. Rice-flat, 300 yards broad, between village and river. 11.2 m., flat ground on left bank. Road along edge of a precipice 1000 feet high; sandstone. 11.6 m., large stream enters river from n.e. 11.8 m., village. 12.3 m., cross stream from w. 12.8 m., stream enters river from e. 15 m., cross stream from w. Road,  $\frac{1}{4}$  mile from river, through a rice-plain. 15.2 m., village, with oranges. Same rice-plain. On left bank hills come right down to river. 16 m., a flat begins on left bank. 16.2 m., a rocky point on right bank. Road close to river. 16.5 m., road close to river. 17.3 m., village. Road close to river. 17.6 m., road  $\frac{1}{4}$  mile from river. Flat ground  $\frac{1}{4}$  m. wide between road and foot of hills. On left bank, hills come right down to river. 19 m., a rocky point on right bank. Road close to river, which divides into three channels, forming two large islands. 19.9 m., village. 20.2 m., cross large river from w.s.w., by ferry. 20.4 m., Shih-Ku, altitude 5952 feet. The road from Ts'u-Kua to Shih-Ku is very good indeed.

22nd.—*Shih-Ku to Chiu-Ho*.—Road now leaves the Chin-Sha-Chiang, and after crossing a spur, to .9 m., ascends left (w.) bank of a tributary. .4 m., soil, red clay and sandstone. Road fair, rice cultivation in valley below. .9 m., rice cultivation ends, valley closes in. Hills on both sides, 800 feet high, sloping  $20^\circ$ , wooded with pines and holly-leaved oak, run right down to stream. Road through a thick jungle of thorns. 1.3 m., cross stream from s.w. 1.8 m., cross river to right (e.) bank. 2 m., stream enters river from s.w. 2.6 m., stream enters river from s.w. 3.2 m., cross stream from n.e.; stream enters river from s.w. 4.2 m., road through an open pine-wood. Some potatoes in a field. Road now turns to e., and leaves stream, ascending a hill. 5.4 m., summit—Chin-Ku-P'u, altitude 8391 feet. A good deal of buckwheat cultivated both at the summit and on the slopes. The valley to the e., which has a good many houses and small villages in it, is cultivated with buckwheat and Indian corn. 7.7 m., a water-parting; altitude, 7946 feet. Small pond on left of road. 8 m., north end of a lake, on right of road, 400 yards wide. Hills which bound it on the w. are 500 feet high, sloping  $20^\circ$ , and throw out rounded spurs, 150 feet high, sloping  $20^\circ$  to  $30^\circ$ . They are wooded with pines and holly-leaved oaks, the red clay showing through, and there is cultivation in patches. On e. side, spurs slope  $20^\circ$ . Patches of buckwheat, Indian corn, and pines. Soil, red clay and gravel. Road from Shih-Ku to this point is fair in wet, and very good in dry weather. 9 m., village at s. end of lake, where a stream issues. Road now descends left (e.) side of stream, in a fine valley. 10.3 m., village on right bank. 10.6 m., village. 11.6 m., village on right bank. 12.1 m., village. 12.9 m., village. 13.7 m., road  $\frac{1}{4}$  mile from river. 14.6 m., cross stream from e., by the first arched bridge seen since Ta-Chien-Lu. A temple, the white end of which was visible at 11 m. On the w. side of the valley is a large collection of villages, extending nearly a mile. 15.3 m., village. 15.8 m., Chiu-Ho, altitude 7565 feet;  $\frac{1}{4}$  mile from river. This fine valley is all cultivated with rice, and has pears and walnuts. It is bounded on both sides by red-clay and sandstone hills

sloping  $20^{\circ}$ , very little cultivated. There are a great many villages and houses at the foot of the hills on both sides, but none in the centre. The road from 11 m. to this point would be good after a long, dry season, but the soil is a deep stiff clay, and is exceedingly bad after rain or during wet weather.

23rd.—*Chiu-Ho to Chien-Ch'uan-Chou*.—Road descending valley. 6 m., village. Friable sandstone striking E. and W. 1 m. to the W. is the village of the chief of the district. Road  $\frac{1}{4}$  mile from river, separated by a ridge of rounded hills 100 feet high, sloping  $15^{\circ}$ ; the plain on E. of ridge is  $\frac{1}{4}$  mile wide. 1 m., cross stream from E. 1.6 m., village. Stream on right of road. 1.8 m., no rice just here, nearly all Indian corn. 2.1 m., road regains river, and crosses to right (W.) bank by arched stone bridge. 2.5 m., pagoda, at end of spur. Rice cultivation in valley. Plain to W. of road is  $\frac{1}{4}$  mile wide. A very large village at foot of hills on W. 3 m., cross river to left (E.) bank by stone arched bridge; village. 3.4 m., road close to hills. Spurs to E., sloping  $10^{\circ}$  to  $20^{\circ}$ , covered with small firs. A rice plain, on W. of river,  $\frac{1}{4}$  mile wide, stretches to foot of hills. 3.7 m., cross stream from E. 3.8 m., village. Broken ground on W., between road and river; a rice plain to E., 200 yards wide. 4.1 m., a plain 100 yards wide, to W. of road, beyond which are grassy rounded spurs 100 feet high, then river; on the E. are rounded spurs 100 feet high, thrown out from range behind. A rice plain stretches  $\frac{1}{4}$  mile to E., bounded by grassy spurs 200 to 300 feet high. 4.8 m., cross river to right (W.) bank. 5 m., cross stream from W.S.W. by stone bridge. A rice plain stretches  $\frac{1}{4}$  mile to W., bounded by grassy spurs 200 to 300 feet high. Village on right of road. 5.8 m., village. 6 m., road leaves river, which flows S.E., into a large lake. From Chiu-Ho to this point the road is very bad indeed, through deep, sticky mud and red clay; in places it is paved with very rough small stones. It is now close to hills on W. A plain extends  $\frac{1}{4}$  mile to E., bounded by red, rounded grassy spurs 70 feet high. 6.4 m., village. 6.8 m., village. Road close to hills on W. 7.3 m., plain to E., 3 miles wide, with a curious little hill in the centre, on which is a pagoda. 7.8 m., cross stream flowing E.S.E. 8 m., N. gate of city of Chien-Ch'uan-Chou, altitude 7489 feet, situate in the middle of a rice plain which drains into the Lan-Ts'ang-Chiang. Potatoes for sale in the city. A large lake to S.E. Road from 6 m. to this place is rather better than the first few miles, but is still indifferent. The road in the plain is rough and badly paved. Soil, red clay. Hills on both sides of road, red sand and clay, covered with grass and pines, the red soil showing through. Houses built of red clay—everything in the whole valley is red.

24th.—*Chien-Ch'uan-Chou to Niu-Chieh*.—Leave city by E. gate, and go round to S. gate. 5 m., cross stream from W. Four villages on right of road. 1.2 m., cross stream flowing E. by arched bridge. 1.6 m., village on right of road. N. end of a large lake  $1\frac{1}{4}$  m. to E., 3 miles long, N. and S., and about 1 mile wide. 1.9 m., village, with detached houses far apart, covering a good deal of ground. Crops, paidza, beans, buckwheat, and chiefly, rice. Cross stream flowing E.N.E. 2.2 m., village on right of road. 2.4 m., cross stream flowing E.N.E.; village. 3.2 m., village on right of road. 3.5 m., village and pils. 3.9 m., village on left of road; cross stream flowing N.E. by arched bridge. 4.2 m., village. 4.3 m., cross river 108 yards wide, by bridge 136 yards long; this river flows from the lake, S.W., to the Lan-Ts'ang-Chiang. There are extensive aqueducts for irrigation. 4.6 m., village. 4.8 m., village. 5 m., village. 5.3 m., cross stream with wide bed, flowing N.E. into S. end of the lake. 6 m., road over spur between two streams. The road from Chien-Ch'uan-Chou to this point was once paved, but all the stones that are left are out of their places, many are gone, leaving deep holes, and the road is very bad for mules or ponies. It is not very bad for coolies in fine dry weather, but in wet weather it is dreadful for anything; hence to



I-Yang-T'ang the road is bad for everything in wet, but very fair in dry weather. 7 m., road on crest of spur; dark-red and black friable sandstone. 7.4 m., road regains stream crossed at 5.3 m., and ascends right (N.E.) bank. 7.8 m., very broken ground. 8.2 m., village. 8.4 m., broken ground. Valley 1 mile wide. Confluence of streams from S. and S.E.; road crosses that from S.E., and continues between them. 9 m., commence ascent of hill. 10 m., I-Yang-T'ang, altitude 8681 feet. Source of streams on E. and W. From 8.5 m. to this place, the hills on both sides are covered with small firs and holly-leaved oaks. 10.8 m., summit, altitude 8849 feet. The ascent from I-Yang-T'ang to the summit is steep and muddy, and in wet weather exceedingly difficult, but it would not be bad in a dry season. 15.4 m., end of descent. 16.5 m., Tai-P'ing-Chên, on a plain to left of road; precipices close to the road on the right. Between the summit and this place, the road, in many places, is very steep. It would be very fair in dry weather, but in the wet season the heavy clay and mud are frightful. 19 m., village. 20 m., Niu-Chieh, altitude 7113 feet. From a little north of Tai-P'ing-Chên to Niu-Chieh, the road is through a plain, and is paved similar to that in the plain of Chien-Ch'uan-Chou. It is very bad for horses at any time, as all the stones are out of their places, and in wet weather the mud is awful. All the hills from Chien-Ch'uan-Chou to Niu-Chieh are of red sandstone, and stiff red clay.

25th.—*Niu-Chieh to Lang-Ch'ung-Hsien*.—Road traverses a plain 2 to 4 miles in width. 1.6 m., village. 1.8 m., cross stream flowing S.W. 2 m., houses. 3.2 m., village. 4.1 m., cross stream flowing W., towards a crack in the hills. A road leads off to S.E. 6 m., village. 6.8 m., cross stream flowing S.S.E. From Niu-Chieh to this point the road is fair, but generally roughly paved. 7.7 m., pagoda on hill,  $1\frac{1}{2}$  mile to E. Road from 6.8 m. to this point, unpaved, but good, skirting the foot of a spur about 500 feet high; hence to 8.4 m., it is really well-paved, and very good. 9.6 m., cross river from S. 10 m., Lang-Ch'ung-Hsien; altitude 6970 feet. Between 8.4 m. and this place there is a causeway over a swamp, well paved and good. The river from S. running into this lake or swamp is embanked on both sides, and its level is much above that of the surrounding country.

26th.—*Lang-Ch'ung-Hsien to Têng-Ch'uan-Chou*.—Road for  $1\frac{1}{2}$  m. is along river embankment, and very good. 1.2 m., village. 1.5 m., road leaves river and turns to E. 2 m., village. 3.4 m., cross stream flowing E.S.E., from S. end of lake. Road from 1.5 m. to this point is embanked, and over a marsh. 3.6 m., village. Road enters a narrow gorge  $2\frac{1}{2}$  miles long, through which the stream rushes between very steep hills, almost precipices, and falls 200 feet in this distance. The road through this gorge is not paved, but is good and hard, even in wet weather. 3.8 m., cross stream from S.E. 4 m., pagoda. 4.6 m., stream enters river from S.; altitude 6850 feet. 6 m., end of gorge. Road now crosses a plain, descending the river. 7.5 m., N. end of a swampy lake on right of road. 9.4 m., Yu-So; altitude 6758 feet. Between 6.5 m. and this place there is a road on both sides of the river, and the embankment is good and firm even in wet weather. The plain of Yu-So appeared to be nearly all a wide swamp; but the rainfall had been excessive, and in ordinary seasons it is not so wet. There are several villages in it, and the crops are nearly all rice. On the lower slopes of the hills there are a good many trees, but there are absolutely none in the plain, except at the edges of the river. Prickly pear is abundant. 10 m., road leaves river. 12 m., city of Têng-Ch'uan-Chou; altitude 6573 feet. The road between 10 m. and this place is over a swamp (except close to city), is badly paved, and in some parts full of holes. The rocks are red and friable yellow sandstone, and the soil a very heavy reddish clay.

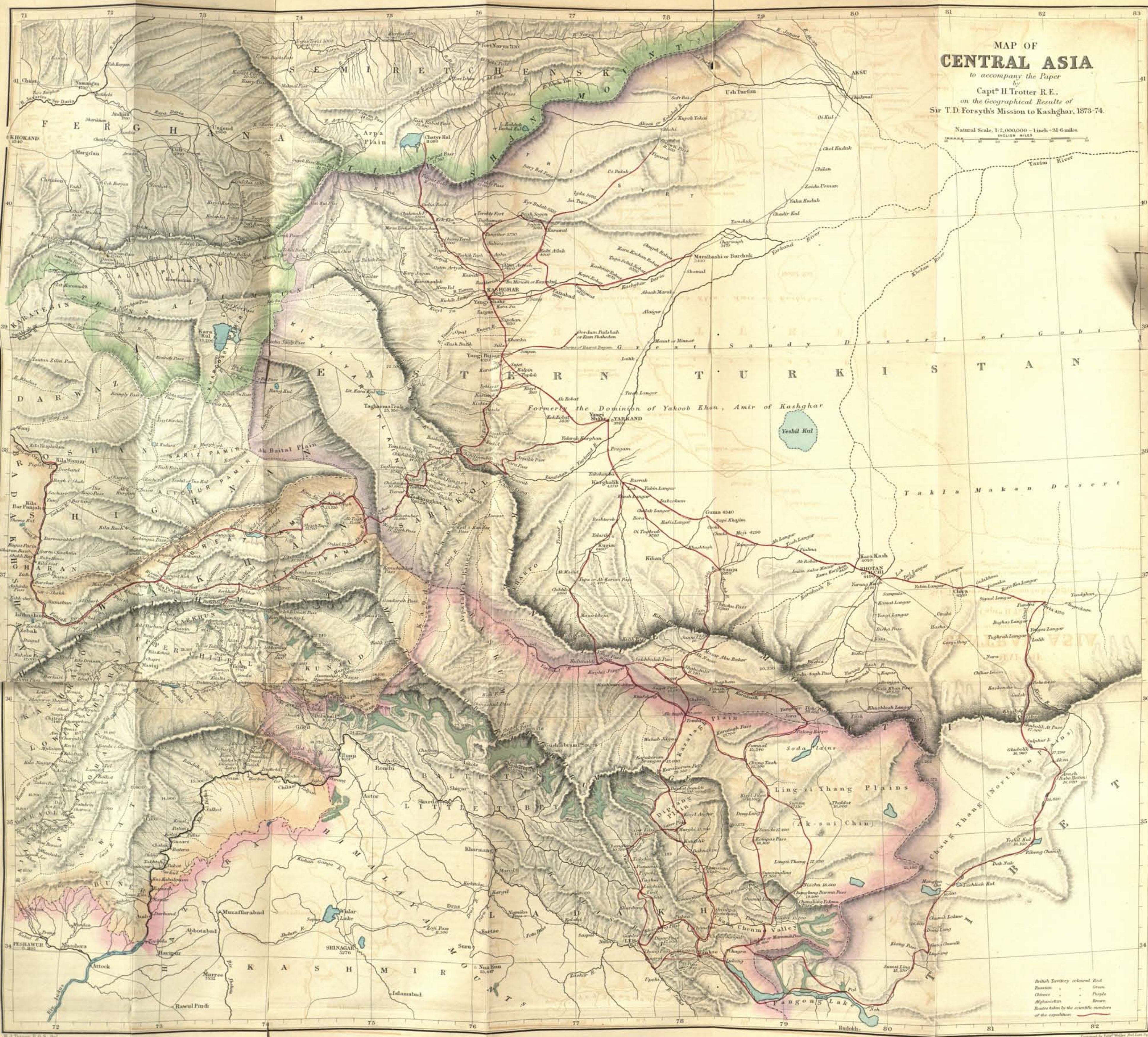




MAP OF  
**CENTRAL ASIA**

to accompany the Paper  
by  
Capt<sup>d</sup> H Trotter R.E.  
on the Geographical Results of  
Sir T.D. Forsyth's Mission to Kashghar, 1873-74.

Natural Scale, 1:2,000,000 - 1 inch = 31.6 miles.  
ENGLISH MILES





V.—*On the Geographical Results of the Mission to Kashghar, under Sir T. DOUGLAS FORSYTH in 1873–74.* By Capt. H. TROTTER, R.E.

[Read, May 13th, 1878.]

ABOUT this time five years ago, I was in the peninsula of Kattywar, in Western India, seated in an arm-chair outside my tent-door. The hot wind which had been blowing through the day had just lulled, but the thermometer stood at over 100°; and I was, after an unusually hot season, which had taken a good deal out of me, anxiously expecting a favourable reply to an application I had made for furlough to England. A telegram was suddenly put into my hands which very speedily altered the current of my thoughts. It was from my chief, Colonel Walker, the Superintendent of the Great Trigonometrical Survey, informing me that the Viceroy of India was about to despatch a Political Mission to the Atálik Gházi of Yárkand, and that an officer of the Survey Department would probably be deputed to accompany it as Geographer. Would I like to go? My first act was to despatch an immediate reply in the affirmative, and my second—I feel ashamed in this assemblage at having to confess it—was to get hold of an Atlas and make search as to what part of the Asiatic continent Yárkand was to be found in. Happily I have, since then, had considerable opportunities of adding to my stock of knowledge concerning that then little-known portion of Central Asia, to which I was shortly to proceed. It is for the purpose of communicating to the Royal Geographical Society some of that recently-acquired knowledge that I have the honour of standing here this evening.

The Mission under Sir Douglas Forsyth was despatched by the late Viceroy of India for the purpose of making a treaty of friendship and commerce with the Ruler of Eastern Turkistan—then called Yakooob Beg, the Atálik Gházi of Yárkand—of late years better known as the Amír of Kashghar.

The Mission left India in the summer of 1873, and was absent for rather more than a year. A considerable amount of literature exists on the subject of this Expedition; for besides very voluminous reports to Government from the seven European officers\* of whom the Mission was composed, two books on the same subject have been published in England, viz., the 'Roof of the World,' by Colonel Gordon, and 'Kashmir and Kashghar,'

\* Sir T. Douglas Forsyth, C.B., K.C.S.I., Envoy and Plenipotentiary; Colonel T. E. Gordon, C.S.I.; Dr. H. W. Bellew, C.S.I.; Capt. John Biddulph, 19th Hussars, A.D.C. to the Viceroy; Capt. Chapman, R.E.A.; Dr. Ferdinand Stoliczka; Capt. Henry Trotter, R.E.



by Dr. Bellew. The volume of 'Reports' also contains an interesting series of photographs taken, under circumstances of great difficulty, mostly by Captain Chapman; some few by myself.

Much of the following narrative is taken from my own section of the volume of 'Reports,' of which not many copies were printed, and but very few have been made available to the general public. To that volume,\* however, I must refer all those who may wish for further information on the astronomical, meteorological, and hypsometrical and magnetic observations taken during our absence from England, as also for detailed itineraries of all the routes traversed by the various members and employés of the Mission.

The roads between Leh and Yárkand, and the nature of the country traversed, have on a former occasion been eloquently described to the Society by their Gold Medallist, Mr. Shaw, the pioneer of English influence in Eastern Turkestan, as well as by the intrepid Hayward, who lost his life in endeavouring to reach those unknown and almost inaccessible Pámír regions which it was afterwards our good fortune to travel. I will only, therefore, rapidly glance at some of the physical obstacles actually encountered along our line of march. The first thing that strikes an outsider is the extreme circuitousness of the road. It will be observed that starting from Simla, the summer headquarters of the Government of India, our ultimate destination being Yárkand, we have first to travel nearly south for 100 miles to Umbálá—then, in a north-westerly direction, to Rawul Pindi, a distance of 370 miles; for 200 of which, from Umbálá to Lahore, we were aided by the railway—and the last 170 miles by wheeled carriages on a good highway. From Rawul Pindi, 40 miles up-hill to Murree, one of our hill sanatoria, we are further aided by wheeled carriage. From this point onwards, all our journeys were performed on horseback, except where the difficulties of the ground compelled us to go on foot; or, in the case of ice, to mount on yáks. Our tents, baggage, and supplies were carried by men, ponies, mules, donkeys, oxen, yáks, or sheep. From Murree our road lay nearly due east right across Kashmír Proper to Leh, the capital of Ladákh, originally a province of Western Tibet, but now under the rule of the Maharaja of Kashmír. The road from Murree to Leh, a distance of 390 miles, is too well known to require description here, and in the summer season presents no formidable difficulties, although we experienced considerable discomforts in the way of rain and heat. For several months in

\* 'Account of the Survey Operations in connection with the Mission to Yárkand and Kashghar in 1873-74.' By Captain Henry Trotter, R.E., Deputy Superintendent Great Trigonometrical Survey of India.

the winter season, however, all traffic is stopped by the snow on and in the vicinity of the Zoji La, the point where the road crosses the watershed of the main Himalayan chain, at an elevation of 11,300 feet above the sea. According to the Kashmir Route-book it is 31 marches, or 389 miles, from Murree to Leh, *viâ* Srinagar; while it is 36 marches, or 461 miles, from Leh to Simla direct, the route by which I returned to India. This direct road, however, is only open for a few months in the year. On the whole traders generally prefer the longer, more circuitous, but easier route by which the Mission proceeded.

All traders from India to Yárkand are compelled to pass through Leh, it being the only place where fresh baggage-animals and supplies can be obtained for the onward journey. For all practical purposes the roads thence to Turkistan may be divided into three, viz.:—

The Kárákorum route with variations (leading to Yárkand).

The Chang Chenmo route with variations (leading to Yárkand and Khotan).

The Rudokh (or Chang Thang) route (leading to Khotan).

The Kárákorum route may be subdivided into two, the Zamistáni or winter and the Tabistáni or summer road, and although these have a few marches and camping-grounds in common, and cross the watershed between India and Central Asia at the same point, the Kárákorum Pass, yet they diverge from each other throughout the greater part of their courses. As a rule it may be laid down that the winter road passes, wherever possible, along and over the beds of rivers, which in the cold season contain but little water, and are generally frozen over: these streams, which form no obstacle in winter, are often impassable torrents in summer, in which season also there is much danger from avalanches in many parts of the road. It is therefore no matter of surprise that, in spite of the intense cold and hardships of a winter journey, the merchant often selects that season for his travels. The first great obstacle to be encountered, after leaving Leh, both in summer and winter, is the well-known Kailás Range. To the north of Leh this range divides the drainage of the Indus and the Shyok, and is one of the most formidable obstacles to be encountered by the traveller to Turkistan. In winter it is crossed by the Digar La (17,930 feet above sea-level), a very difficult pass, in crossing which it is necessary to employ either yáks or men for the carriage of goods. A party of the Mission went over it in June, and even then there was snow lying on the top, while ice and snow combined to render the passage difficult along a distance of some miles.



The summer road crosses the Khárdung or Leh Pass,\* almost north of Leh, and is 17,900 feet in height. This pass also is impracticable for laden ponies, and is so difficult that late in June, on our return journey from Yárkand, after descending the Nubra River, it was deemed advisable to go a long detour, *viâ* the Digar Pass, in order to avoid the still more formidable obstacles on the Khárdung. This made the journey from Sati to Leh 42 miles instead of 29. After crossing the Kailás Range and entering the Shyok Valley, the traveller has now before him the great Muz-tágh † or Kárákorum Range. In the winter by following the narrow, winding, and difficult valley of the Shyok River, he reaches the Kárákorum Pass, a distance of 114 miles: in the course of this portion of the journey the frozen surface of the stream has to be crossed no less than thirty-six times. In winter this can easily be done, as it is generally bridged by snow and ice; but in summer, owing to the floods caused by the melting glaciers, an entirely different route has to be adopted, and, instead of ascending the Shyok, the traveller descends that river to a short distance below Sati and then ascends the Nubra River, a large tributary fed from glaciers in the same mountain mass that supplies the Shyok.

The Shyok is crossed in boats near Sati, where in the summer it is a very large and rapid river. Passengers and goods are carried over in boats, while the baggage-animals are made to swim across. Many of the latter are drowned in crossing.

Ascending the Nubra Valley, one of the most fertile and richly cultivated in Ladakh, the traveller goes as far as Changlung (10,760 feet), almost the highest village in the valley, and situated about 40 miles above Sati. The merchant generally takes this bit very easily, advancing by short marches of ten miles each, in order to make the most of the supplies of grain and excellent lucerne-grass, both of which are here obtained in abundance. The caravans from Yárkand often halt a week at Panamik (a large and flourishing village a few miles below Changlung), to feed and rest the baggage-animals after the hard work and scant fare that they have had on the journey. It is here that on the outward journey the real difficulties of the march commence. Instead of following one stream right up to its source in the Kárákorum Pass, as is done in the winter route, the traveller has first of all to cross a very high and precipitous hill just above Changlung village. The road ascends by a zigzag and rises rather more than 4000 feet in a length of about 4 miles, the stiffest bit of ascent on the whole journey to

\* Sometimes also called "Laoche La."

† In Turki "Muz-tágh" means "Ice Mountain," and "Kárákorum" is the equivalent of "Black gravel."

Yárkand. After reaching the top of the Karawal Pass, the road descends into the Sásér stream and then passes up it to the Sásér La, a pass over a mighty ridge covered with snow and glaciers, which runs down from the great mountain mass forming the eastern extremity of the so-called Kárákorum Range, and separates the waters of the Nubra\* from those of the Shyok. This pass (17,820 feet) is one of the most difficult on the whole road, and is rarely, if ever, free from snow; while the road passes through, over, and alongside of glaciers for many miles.† The road from the top of the pass follows the bank of a stream which enters the Shyok River at Sásér Polu, a halting-place on the winter road. The Shyok is here crossed with difficulty, as is proved by the fact that two Ladakhis were drowned there when returning from laying out supplies for our return journey.

The road now descends a tributary stream on the left bank of the Shyok, crosses a low pass, and at Murghi Camp joins another stream which flows from the Dipsang plains into the Shyok River. It was at this point, at a height of 15,200 feet, that our comrade, Dr. Stoliczka, breathed his last, after having traversed the Kárákorum Pass, and the perhaps still more trying Dipsang plains which rise to an elevation of about 18,000 feet above the sea. The intense cold of this bleak and dreary waste prevents this route from being adopted in winter, during which season the caravans follow the Shyok River, from Sásér Polu up to Daulat Beguldi (Turki for "Daulat Beg died," an appropriate name for so desolate a spot). This camp, which is situated in the north-west corner of the Dipsang Plain, marks the junction of the winter and summer routes, which unite here, and cross the Kárákorum Pass, 11 miles above the camp, continuing together a distance of 40 miles farther to Ak-tágh. The Kárákorum Pass, though 18,550 feet above the sea, is by no means so formidable an obstacle as is generally supposed. It is always free from glaciers, and in summer from snow. The ascent on both sides is gentle, and the road good; so that, although it forms the water-parting between Hindústán and Central Asia, it is less of an obstacle to the merchant than the Digar, the Khárdung, the Sásér, or the Sánjú passes. From it the road passes along the Kárákorum stream (one of the head-waters of

\* At the head of the Nubra Valley a road passes over the main Kárákorum chain by the Chorbut Pass and descends into the Yárkand River at Khufelong. It was formerly much used by the Baltistan merchants, but is now rarely employed. It is probably not less than 12,000 feet high, and is always closed for at least nine months in the year, and is at no times practicable for laden animals.

† On the return journey of the Mission, several hundreds of coolies were employed for some weeks in preparing the road over this pass.



the Yárkand River) to Ak-tágh, traversing the comparatively open ground on the west of Kárátagh Plain.\* At Ak-tágh the roads again diverge, the winter route continues down the Yárkand River, which is crossed eighteen times between Ak-tágh and Kúlúnaldi,† a distance of 74 miles. At the latter place this road ascends the range that was called by Hayward the "western Kuen Luen," and crosses it by the Yangi-Diwan (or "New Pass," 16,000 feet), into the Tiznáf River, whose course it follows for 41 miles to Chiklik. The road is here taken over one of the northern spurs of the Kuen Luen by the Tupa‡ or Ak-korum Pass (10,470 feet), whence it descends along the banks of a gently sloping stream to Kugiar, a considerable village (containing 400 or 500 houses) on the borders of the plains of Eastern Turkistan, and 41 miles distant from Karghálík, a large town situated at the junction of the Zamistáni (*viá* Kugiar), and the Tabistáni (*viá* Sánjú) routes. It was by the Kugiar road that the Mission returned to India. The road had been closed for several years previously by order of the Yárkand authorities owing to the risk to which travellers were exposed of being plundered and sold into slavery by the wild Kunjud robbers of Hunza and Nagar, who, coming down from their fastnesses to the north of Búnji and Gilgit, used to render the whole valley of the Yárkand River from Kúlúnaldi up to Ak-tágh utterly unsafe for travellers or merchants, unless in large parties and well armed.§

It was in the month of June that the Pámír party returned by the Kugiar route somewhat too late in the season to traverse

\* "Kárátagh" = "Black Mountain."

† "Kúlúnaldi" = "the wild horse died."

‡ In Turki "Tupa" means "hill," and "Ak-korum" "White gravel."

§ These robbers, apparently from fear of the Kashghar Amir, have of recent years ceased to infest this road; but it is reported that, since the return of the Mission from Yárkand, the Kunjudis have attacked a nomadic tribe called Phakpos, who inhabit numerous valleys on the west bank of the Tiznáf River. The road by which these robbers advance must pass over numerous glaciers, and crosses the Kárákorum Range by the Shingshul Pass, a short distance to the west of the Shigar or Muztágh Pass. The road from Shingshul descends the Kum stream and joins the road from the Muztágh Pass at a distance of one and a half marches to the north of the latter. After three short marches more, the Yárkand River is reached at Dahn-i-Bazar Darah, three short marches below Kúlúnaldi (on the same river), a frequently used halting-place on the road between Kárákorum Pass and Kugiar. The Shingshul Pass is said to be easier than either the Chorbut or the Shigar Passes, and is at times passable by laden horses. The Muztágh Pass (which was estimated by Godwin Austen at 18,400 feet, and by the Schlagintweits at 19,000 feet) road lies for a great distance over glaciers, and is difficult and dangerous. It is occasionally used by the Baltis,<sup>1</sup> who have a colony in Yárkand, and who traverse this pass when returning thence to their own country.

<sup>1</sup> Or natives of Baltistan, a mountainous district inhabited by Shiáh Mussulmans, and lying to the north-west of Ladákh.

it with safety, and considerable danger was incurred from the daily increasing floods of the Tiznáf River, which after noon used to come down with such force as frequently to close the road. At this season, also, the southern slopes of the Yangi-Diwan (Pass) are very difficult to traverse and somewhat dangerous, as the recently dead bodies of numerous baggage-animals seen by us on the return journey too surely testified. The floods of the Tiznáf are probably worse in June and July than at any other time of the year, as after that period the snow on the lower mountains has nearly all been melted. The Yárkand River, on the other hand, above Kúlúnaldi, being principally fed by glacier-streams, is more difficult later on in the hot weather. Although there was a much larger body of water in the Yárkand than in the Tiznáf River, yet in the former the bed was broad and level, and was crossed without difficulty; whereas in the Tiznáf the stream is narrow, and the bottom generally composed of large stones and boulders, which renders its passage very difficult. On one occasion during the return journey, when I had gone on a couple of days ahead of Colonel Gordon's party so as to have more time for survey, I had, in order to insure security from water, placed my chronometers in my pockets, instead of the mule-trunks where they were usually carried. It was the first time that I had done so, and as ill-luck would have it, I twice got parted from my horse in deep water while searching for a ford, and had to swim for my life with my chronometers in my pocket. On the same occasion my horses and baggage-animals were cut off from all supplies by the floods, and were for more than thirty-six hours without tasting food. The road crossed the river nearly twenty times in one march, or about once in every linear mile of its course. A month earlier in the season (May) the river was frozen and was ascended by an advanced party of natives without difficulty.

Returning to Ak-tágh, the point of divergence of the two routes, the summer road passes thence over a spur of the Kuen Luen by the Sugét, a tolerably easy pass (17,610 feet), from which the road descends along a winding stream to the Kára-kásh River, which it strikes a few miles above Sháhidúla.\*

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\* At Sháhidúla is a small fort which, during the time of the disturbances in Eastern Turkistan (which resulted in the accession of the present King), was occupied by a detachment of the Maharaja's troops from Kashmir. These were subsequently withdrawn, and the place is now generally recognized as belonging to the Kashghar ruler. The Kirghiz of Sánjú have of late years constantly occupied the Kára-kásh Valley up as far as the great bend above Sora, and occasionally ascend some of the valleys to the south, leading up to the Káritágh plain. In many of these valleys there is abundance of grass and wood.



Below Sháhídúla the Kárákásh River winds through the Kuen Luen Range.\* The road follows along it for some 20 miles, and occasionally crosses it. In summer its passage is effected by merchants with considerable difficulty. The Kárákásh flows in the direction of Khotan, and between the river and Yárkand lies a formidable spur from the Kuen Luen, which has to be crossed. The traveller, if he be here unfettered by political obligations, has the choice of three roads before him, viz., by the Kilik, the Kilian, and the Sánjü passes. Traders are seldom or never allowed to use the former; which is said to be the easiest and shortest; it follows the course of the Toghra, a considerable stream which enters the Kárákásh 9 miles below Sháhídúla. The floods of this stream in hot weather often detain travellers a considerable time on its banks. The Kilik Diwán (Pass) is crossed in the third or fourth march from Sháhídúla, and after going over another low pass the road joins the Kugiar route at Beshterek, one day's march to the south of Karghálík; little is known of this road, but it is said that grass and wood are to be found at every stage. It was once much used by the Baltistan merchants who are settled in Yárkand.

Nearly 3 miles below where the Toghra-su enters the Kárákásh River is the fort of Ali Nazar, where the Kilian road leaves the Kárákásh Valley and passes up an open ravine in a north-west direction. This road is sometimes used in the summer as an alternative to that over the Sánjü Pass; it is somewhat higher, but, although impracticable for laden horses, is not so difficult to traverse. The Kilian Pass is crossed in the second day after leaving the Kárákásh. The road follows the stream from the pass for four marches, when it debouches into the Turkistan Plain at the village of Kilian, two marches to the south of Bora on the road between Sánjü and Karghálík.†

The third and most frequented road from Sháhídúla is *viá* Sánjü. It leaves the Kárákásh 20 miles below Sháhídúla at Mazár Abú Bakar, from which place the road ascends to the summit of the Sánjü (also happily named "Grim") Pass, which, although not more than 16,700 feet above sea-level, was decidedly the most difficult obstacle encountered by the Mission on the road to Yárkand. Its summit is never free from snow and ice, and is impassable by laden ponies. Yáks have always to be used and are collected from all quarters for the passage of a large caravan. From the pass the road descends to the Sánjü or Sarikia River, which it follows to the

\* Dividing it, according to Hayward's nomenclature, into Eastern and Western Kuen Luen.

† In former years the Kilian would appear to have been the most frequented route, but it is now little used.

large and scattered village of Sánjǔ, on the borders of the great Turkistan Plain. Occasionally, in the hot season, the Sánjǔ River is so flooded in its lower course as to become impassable, in which case a detour is made by a road which crosses a small spur by the Chuchu Pass (11,800 feet), and then follows the Arpalek stream to near Sánjǔ. Thence a good and level road leads to Yárkand, a distance of 122 miles, and meets the Kilian route at Bora, and the Kilik and Kugiar routes at Karghálík.

Let us return to the Chang Chenmo route from Leh to Turkistan. The road ascends the Indus for 20 miles, and then goes up a tributary stream for 13 miles to Zingrál, from which place the Kailás range may be crossed either by the Chang La (17,600 feet), or the Kay La (17,900 feet). By the former and easier road of the two it is 23 miles from Zingrál to the large village of Tánkse, situated on one of the tributaries of the Shyok River. By the Kay La foot-passengers shorten the road by some 6 miles. The roads over both passes, although free from glaciers, are very difficult; and it is usual, although not absolutely necessary, to employ yáks in carrying goods across.

Tánkse is the last place on this road where supplies are procurable, and is, by the shortest route, 350 miles from Sánjǔ, the first large village encountered in Turkistan. For the whole of this distance supplies of grain, both for men and horses, have to be carried, and at a great many halting-places neither grass nor fire-wood is procurable. From Tánkse, after passing Lukong at the head of the Pangong Lake, the road crosses a lofty mass of mountains by the Lankar or Marsemik La (18,400 feet), a very high, but in summer by no means a difficult pass. It is free from glaciers, and generally clear of snow during the summer and early autumn. Descending into the Chang Chenmo Valley and crossing the stream, a tributary of the Shyok, the road ascends a side ravine to a point 8 miles beyond Gogra, from which there is a choice of three different roads all leading on to the Ling-zi-Thang \* Plains.

The most westerly path ascends the Changlung Pantung Pass (18,900 feet), and descends into a deep ravine running along the stony and very difficult bed of a stream † (which ultimately finds its way into the Shyok River), ascends again, and skirts the western border of the gently-undulating Ling-zi-Thang Plain, in traversing which the traveller crosses, almost without

\* Or Ak-sai Chin.

† The march down this ravine was one of the most trying encountered during the outward journey.



knowing it, the watershed between India and Central Asia. After passing the watershed the road crosses a small stream, one of the head waters of the Kárakásh, and then goes over a spur (Kompás La) 18,160 feet in height, and descends into the bed of the Kárakásh River, which it strikes at an elevation of 17,400 feet above the sea and follows to Kizil Jilga.

The portion of the road between the Changlung Pantung Pass and Kizil Jilga is perhaps the most trying part of this route. The great elevation and consequent bitter cold is much aggravated by frequent snow and a piercing wind which blows from morning to night; the long dreary marches cause one to arrive after dark at camps where there are scant supplies of fuel, and no grass; occasional ice-beds block up the whole road, one of these extends for three miles down the Kárakásh River; all combine to try most severely both man and beast.

At Kizil Jilga the road just described joins an alternative road (taken by Captain Biddulph on the outward journey), which, leaving the usual route a few miles north of Gogra, crosses the Changlung Barma Pass (19,300 feet) on to the Ling-zi-Thang Plains, along which it passes at a still higher elevation than the western road. It descends into the Kárakásh River at Kizil Jilga: the greater elevation makes this road perhaps even more trying than the western route.

The third route from Gogra, before alluded to, leaves the Chang Chenmo Valley 8 miles above Gogra and the Ling-zi-Thang Plain may be reached by either the Changlung Barma or the Changlung Yokma Pass, a little farther to the east, and of about the same elevation. This is the pass taken by Mr. (now Sir) Douglas Forsyth in his first mission to Yárkand. By it, the road followed by Captain Biddulph (striking the Kárakásh River at Kizil Jilga) may be joined, but a more northerly route passing over a succession of elevated plains was taken by the former mission, and the Kárakásh River was struck a few miles above Sora, at the sudden bend that the river takes when its course is turned towards the west (in north lat.  $35^{\circ} 55'$ ) by the Kuen Luen Range. From this point the road followed the river to Sháhídúla.

In addition to the intense cold, the principal objection to all three routes skirting or passing over the Ling-zi-Thang Plains is the extreme elevation at which the traveller has to remain for so many marches: the cattle are exhausted by this, and too frequently suffer in addition from the pangs of hunger and thirst. These difficulties nearly brought the first mission to Yárkand to a disastrous end; and the same causes have proved, and will probably continue to prove, sufficient to deter the experienced merchant from following this road.

The older, shorter, and better known route by the Kárákorum is likely always to be preferred by the merchant even in summer; whereas in winter an attempt to traverse the Ling-zi-Thang Plains must almost always result in disaster.

From Kizil Jilga the road follows the Kárákásh River to Chung Tash (or "Great Stone"). From this point the eastern variation, taken by Captain Biddulph, follows the Kárákásh River right down to Sháhídúla, a distance of 166 miles; while the western or more direct road is only 113 miles in length; and although in the latter there are two high passes, viz., the Kárátágh (17,700 feet) and the Sugét (17,600 feet) to be crossed *en route*, yet they are neither of them difficult ones. The Sugét Pass may be avoided by going over the lower and still easier pass of Fotásh, by which the Kárákásh River is struck one march above Gulbashem. In the circuitous line from Chung-tash down the Kárákásh, the road is bad, but there is the advantage of plentiful supplies of grass and fuel which are almost altogether wanting on the Kárátágh line. The Ling-zi-Thang routes meet the Kárákorum summer route at Aktágh or at Sháhídúla according as the western or eastern variation is adopted.

At the angle formed by the Kárákásh River above Sora, when turned by the Kuen Luen Range, the traveller can proceed to Khotan direct (a distance of 160 miles, or 11 marches) by crossing the Kuen Luen Range by the Yangi or Ilchi Diwan (crossed by Mr. Johnson in his journey to Khotan in 1865), and estimated by him at 19,500 feet in height: after passing this there is another formidable glacier pass, the Naia Khan (height 18,659 feet, according to Johnson), which has to be crossed before reaching the plains. The Ilchi Diwan is said to be open for only three months in the year.

On the Kárákásh River, above Fotásh, is a camping-ground called Sumgal, from which Robert Schlagintweit crossed the Kuen Luen Range by the Hindu-tágh Pass, estimated by him at 17,379 feet high. At the top of this pass is a glacier much *crevassed* and extremely steep. It is a long and difficult march from its foot to the village of Bushia, where are numerous tents and caves occupied by Kirghiz, and supplies can be obtained in large quantities. It is eight marches thence to Khotan, and the road is described as bad. The road by the Hindu-tágh Pass can only be used by foot-passengers.

From all accounts the ordinary trade-route between Khotan and Ladákh in former years was, as at present, *viá* the Sánjú and Kárákorum Passes. The road from Khotan is that to Yárkand as far as Zanguia, whence it diverges to Sánjú Village direct. Another road from Sháhídúla to Khotan lies down the Kárákásh River, and, going over an easy pass, emerges at



Dúba,\* a large village said to lie about 20 miles to the south-west of Píalma (on the Khotan and Yárkand road). The road down the Kárákásh can only be used in mid winter.

We now come to consider the extreme eastern route, *viâ* the Chang-Thang or "Northern Plains." Of this road we have a survey by Kishen Sing Pundit, one of the more important geographical results secured by the Mission.†

A traveller from Leh to Khotan might follow the route by the Pangong Lake, along which the Pundit travelled, but he would more probably take a short cut from Lukong to the Mangtza Lake, following the ordinary Chang Chenmo route to Yárkand as far as the point where that road leaves the Chang Chenmo Valley. Passing up the latter, he would make his way eastward to its head, where an easy pass is known to exist leading on to the high table-land beyond. By adopting this road he would save 40 miles over the more circuitous road by Noh. From Mangtza the road lies over a series of high plateaux, varying from 16,000 to 17,000 feet in height, crossed here and there by low ridges which rise somewhat irregularly from the surface of the plain which contains numerous lakes, most of them brackish. In latitude  $35^{\circ} 7'$  north, the Pundit crossed, at a height of but little more than 17,000 feet, the watershed of a snowy range, which may perhaps be the true eastern continuation of the Kuen Luen. From the north of the pass the Kiria stream takes its rise; the road follows down it as far as Arash (16,000 feet), but again ascends to the Ghubolik Plain which (17,000 feet above the sea) connects the snowy range just alluded to with another somewhat higher range to the north. This last ridge is a buttress of the vast Tibetan plateau, and in descending the Polu stream from the Ghubolik At Diwan‡ (17,500 feet) to Polu, a distance of 28 miles including windings, there is a fall of about 9000 feet. Polu is a small village in the Khotan district, and from it Khotan (or Ilchī) city may be reached either by the direct road (by Chihar Imám) which skirts the feet of spurs from the elevated plateau above, or the traveller may proceed down the stream to Kiria by the route followed by the Pundit.

\* Dúba is shown on Klaproth's map as a large place about half-way between Záwa and Sánjū.

† The only previous account we have of this road is one derived from native information supplied by Mr. R. B. Shaw, and which was published in the 'Proceedings' of the Royal Geographical Society, vol. xvi. (1872) pages 247 and 248. This account agrees remarkably well with that given by the Pundit, and every march can be followed on the large-scale map I have before me as I write.

‡ Or "Sulphur Horse Pass," so called from its being used by the Polu people when bringing sulphur to Khotan. Sulphur is excavated in large quantities from the ground near the lake in the Ghubolik Plain.

Throughout the whole of the road from Khotan to Leh traversed by the Pundit, fuel was abundant everywhere, and there was only one stage where there was not a good supply of grass. These facts would indicate the line as one well adapted for the native merchant, to whom time is of no great value. As far as I can learn however from inquiry, it never has been used as a trade route on a large scale, the chief reason being fear of the Chang-pas\* or Tagh-lik, wandering tribes of Tartars., nominally subject to the Chinese officials at Gartokh and Rudokh, but probably practically only so far subject to them that they would abstain from committing violent aggression on parties travelling under the protection of those authorities. Habibúla, who was elected King of Khotan when the Chinese were turned out of the country, sent messengers to try and open up this route in 1864. They were seized by the Chang-pas and compelled to return to Khotan, with the threat that any subsequent explorers would be put to death. The inhabitants of Kiria and Polu go as far south as Ghubolik to procure sulphur. They also go west of this towards the Yurung-Kásh (or Ilchi) River, where they search for gold and jade; but it would appear that although the Khotanese claim the country up to the head of the Kiria River, as their boundary, yet practically, from fear of the Chang-pas, they never go quite so far to the south. On the other hand the Chang-pas, who probably have equal reason to fear the Turks from the plains, would appear not to wander farther north than Rikong Chumik (the ridge to the north of which separates their grazing grounds from plains on the north, through which flows a considerable stream, passed by the Pundit, asserted by his guide to be the head of the Yurung-Kásh River). It would thus appear that, owing to the mutual hostility of the two races, there is a large tract of neutral ground which is never occupied by one or the other, extending from Rikong Chumik to Ghubolik; here the Pundit saw large herds of yâk, antelope, and jungle sheep (*Oves ammon*), which had apparently never been scared by the sight of man. Near Rikong Chumik were the remains of numerous huts; others were frequently seen along the road, but fortunately for the Pundit he did not meet or see a single human being between Ghubolik and Noh, a distance of 244 miles, a circumstance which enabled him to complete his route survey up to Noh without interruption.

From Noh he tried to get to Rudokh, but was not permitted to do so; in fact the inhabitants tried to compel him to return by

\* Chang-pa in Thibetan means *North-man*, while the Turki name for the same people is *Tagh-lik*, i.e. *Mountaineer*.



the way he had come, and it was with great difficulty that he at last got permission to go to Leh direct. Anticipating a search by the first people he should encounter, he had, when nearing the village of Noh, concealed his instruments and papers in a bush. He was duly searched, but of course nothing was found, and he afterwards succeeded in again getting possession of his valuables. In Tibet the great difficulty encountered by persons entering in disguise is always on the frontier, where the examination is very strict. When once allowed to pass into the interior of the country there is little to fear.

The newly-acquired knowledge of this road may perhaps lead to important practical results, but not until our relations with the Chinese empire, and their too independent subordinates in Tibet, are placed on a more satisfactory footing than they are at present. It is apparent, by combining the results of this survey with other information collected by the survey Pundits during the past few years, that a road exists between the plains of Hindustan and Turkistan which entirely avoids the territories of the Maharaja of Kashmir, and which, in the summer months may be traversed without once crossing snow, or without encountering one really difficult pass, such as we know to exist on the Kárákorum and Chang Chenmo routes. Leaving the plains of India at the ancient city of Najibabad (between Hurdwar and Moradabad), the starting-point of the old Royal Road stated by Moorcroft to have crossed these same mountain systems, a good road, about 210 miles in length, and only crossing one low pass,\* leads to the Niti Pass (16,676 feet high) over the main Himalayan Range. Descending from the Niti Pass due north into the Sutlej Valley, and crossing that river at Totling (12,200 feet) by the iron suspension-bridge still existing (said, according to local tradition, to have been constructed by Alexander the Great) and crossing by the Bogo La (19,210 feet) into the Indus Valley at Gartokh (14,240 feet), the road would then follow that river to Demchok.† Thence it would go over the Jara Pass due north to Rudokh and Noh, and by the newly surveyed route to Polu and Khotan.

Estimating the distance from Najibabad to the Niti Pass at 210 miles, thence to Noh at 275, and from Noh to Khotan (*viâ* Kiria) 446 miles, we have a total distance of 931 miles between Najibabad and Khotan; and this even might be considerably shortened by taking the direct road from Polu to Khotan.

[The ancient Royal road probably followed the above to the suspension-bridge at Totling, and thence to Rudokh and Noh,

\* The Langar Pass, 6500 feet high, which is on the third day's march from the plains.

† A more direct route exists from Totling *viâ* Dankhar to Demchok.

whence a road now exists which passes *viâ* the head of the Chang Chenmo Valley and Nischu on to the Ling-zi-Thang plains, down the Kárakásh River and over the Sánjü Pass to Sánjü (or Sarikia) which is half-way between Yárkand and Khotan.]

Summarising our knowledge of the lengths of the various physically practicable routes from Hindustan to Turkistan we find that the distances are:—

	Miles.
From Amritsir to Leh <i>viâ</i> Rawul Pindi and Srinagar .. ..	635
"    "    to " <i>viâ</i> Kangra .. ..	522
"    "    to " <i>viâ</i> Sealcote and Kashmir .. ..	575
"    Leh to Yárkand <i>viâ</i> Ling-zi-Thang and Kárakásh River ..	584
"    "    " <i>viâ</i> Chang Chenmo and Kárátágh .. ..	527
"    "    " <i>viâ</i> Kárákorum Pass and Sánjü (summer route) .. ..	445
"    "    " <i>viâ</i> Kárákorum and Kugiar (winter route) .. ..	472½
"    "    " <i>viâ</i> Noh, Polu, and Khotan .. ..	839
"    "    Khotan <i>viâ</i> Kárákorum and Sánjü .. ..	415
"    "    " <i>viâ</i> Ling-zi-Thang and Ilchi Pass (Mr. Johnson's route) .. ..	437
"    "    " <i>viâ</i> Noh, Polu, and Kiria .. ..	637
"    Amritsir to Yárkand by the road followed by the Mission, i.e. <i>viâ</i> Rawul Pindi, Srinagar, Leh, and the summer Kárákorum route .. ..	1080
"    Najibabad to Khotan <i>viâ</i> the Niti Pass and Western Tibet .. ..	931

At some distant day it is not impossible that the last-named road may form the highway to Turkistan; but as long as Europeans are rigorously excluded from Western Tibet we cannot hope that this consummation will be realised.

At a meeting of this Society in June 1874, when letters were read by Sir Henry Rawlinson that had shortly before been received from members of the Mission then in Yárkand, an idea appeared to prevail that I had been able to extend the triangulation of British India to meet that of Russia. This idea was erroneous; in the first place, Russia hitherto has not carried a trigonometrical survey into its recently-acquired territories in Asia, and the mapping of their explorations in Turkistan has necessarily been based on astronomical observations taken at places of importance, which have been connected together by route-surveys of varying degrees of accuracy. This system I was myself ultimately compelled to adopt, and the whole of my mapping in Kashgharia and in the Pámírs is based on my own astronomical observations.

For a few marches from Leh in every direction the country had been in former years, correctly surveyed and mapped by



parties of the Great Trigonometrical Survey, under the late Colonel Montgomerie, R.E., but between this rigorously executed survey and the table-lands of Turkistan lie vast tracts of mountainous country, parts of which, through the enterprise, zeal, and energy of Messrs. Shaw, Hayward, and Johnson (all of them names well known to this Society), have been mapped with tolerable accuracy, while other parts have probably never yet been traversed by man, certainly not by geographers. It was my object to weld together, as far as possible, the existing materials into a harmonious whole, and to add whatever I could to existing data. It is true that at an early period of the undertaking I had hoped to be able to extend our triangulation for a considerable distance farther than it had already reached in the regular operations of the Kashmir Survey, and had the weather been more favourable, and had I had more time and means at my disposal, something might possibly have been done to this end; but as it was, owing to the antagonism of the elements, my diary shows one almost continuous succession of disappointments, most disheartening, considering that it was but the beginning of the journey, and that I did not know but that political reasons might prevent any work being done after reaching Yárkand territory. Climbing hills at the great elevation we were then at was very hard work, and of course occupied considerably more time and labour than similar ascents at a lower level; and in nine cases out of ten when one did arrive at the top of a high hill, snow and clouds entirely obscured both distant and neighbouring peaks. This cloudy weather, combined with the necessity of regulating halts and marches according to the places where supplies had been laid out, soon made it evident that it was useless to attempt a continuation of the triangulation. The length of some of the marches and the shortness of the days made the execution of a careful traverse as impossible as the triangulation, and, after some very hard work, I reluctantly came to the conclusion that nothing could be done by myself (in addition to astronomical work), but to make what use I could of the plane-table. Even with this but little was done, owing to the extremely unfavourable state of the weather; but I fortunately succeeded in fixing my position satisfactorily at two or three places on the road to Sháhídúla by means of certain trigonometrical points which were fixed years ago by the Survey Department in advance of the accurate detailed survey. Many of these points were in the main Kárákorum and Kuen Luen ranges; some of them in the heart of the *terra incognita* before alluded to.

The Survey Pundits meanwhile kept up a continuous route-survey along all the lines of march followed by myself and the

other parties of the Mission. They were unavoidably obliged to accompany the main camps, to march when they marched, and halt when they halted; and as the marches are arranged for the convenience of travellers, and not of surveyors, some of them were found uncommonly stiff and difficult to get through before dark. As the Pundits were in pairs a great part of the way, and thus able to divide the work, the ground was got over with a fair amount of accuracy; and checked and corrected by the latitude observations taken both by themselves and myself on the outward and return journeys, the routes are certainly laid down with an amount of accuracy not hitherto attained.

I should explain that the Pundits are trained to execute a traverse survey, the angles of which are measured with a prismatic compass, and the distances determined by the number of Pundits' paces. These paces have a slightly different unit of length, which is generally determined at the close of operations by comparing the total amount of northing or southing as shown by the traverse, with the true corresponding distance as determined by the difference of latitude between the starting and closing points. The Pundits are all able to take latitude observations with a sextant, and are instructed to do so wherever opportunity occurs. It is obvious that the accuracy of the survey depends upon their being able to keep up a continuous measure of the road; any break in it would ruin the work. Hence the necessity, if possible, of their working in couples, so that they may relieve each other in the pacing, especially where, as in the present case, they were obliged to accompany the large camps, and could not select their own halting-places. The days were getting short, and if darkness once overtook a man before he had concluded his work, there was every probability of his whole survey being spoiled.

To give some idea of the difficulties of surveying these mountain ranges, I may mention that, in addition to the crossing of six passes, the lowest of which is 17,600 feet above sea-level, from the day on which we reached Gogra until arrival at Sugét, a period of twenty-three days, I was never at a lower level than 15,000 feet, and during that period the thermometer seldom rose as high as freezing-point (32° Fahrenheit), whereas at night the minimum would vary from zero to 26° below zero.\* Out of this time I was, for a period of twelve days, never at a lower level than 16,300 feet; while four consecutive camping-grounds were all over 17,000 feet. The highest elevation at which our tents were pitched was at Dehra Kompás camp, 17,890 feet

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\* i. e. 58° Fahrenheit below freezing-point.



above sea-level, *i.e.* more than 2000 feet higher than the summit of Mont Blanc. While I was at these great heights, one of my companions, Captain Biddulph, was travelling by a more easterly route over still higher ground, five consecutive halting-places having averaged 17,600 feet above the sea-level. It was in traversing these high lands that Dr. Stoliczka laid the seeds of the illness that ultimately lost him his life. For many days he was in a most precarious state, but after some days' careful nursing by Captain Biddulph, he apparently recovered. He subsequently encountered much hardship and exposure on our Expedition to the Pámír and on the return journey to India, when within a few days' march of Leh, a sudden recurrence of his former malady in a few hours cut short in its prime a life that was full of promise, and lost to me a most valued friend. He was buried at Leh, where a handsome monument has been erected by the Indian Government to his memory.

In these elevated regions whenever the wind was blowing, the cold was so intense that even the natives of Ladákh who were with me used, on arrival at the top of a hill, to lie down in hollows or crouch behind stones in order to avoid the bitter blast, which seemed to penetrate one's marrow. Under these circumstances satisfactory work could not be expected, and although I kept my own health in a wonderful manner, nearly all the natives who accompanied me suffered severely. It was with no small satisfaction that Dr. Stoliczka and myself joined the envoy's camp at Ak-tágh on the 13th of October, as we knew that thence we should push on with all available speed to warmer and more hospitable regions. Our difficulties were, however, by no means over, as the Sánjú or Grim Pass, although only 16,700 feet above sea-level, was about the most difficult piece of the whole road. It was impossible for men or beasts to keep a firm footing on the icy zigzags, and many of the baggage-animals were precipitated over the snowy sides of the mountain. We lost eight mules and three ponies in the passage; while the Yárkand envoy, who followed us, left twelve horses dead on the pass.

Time does not permit me to dwell further on the mountain-ranges separating India from Turkistan. The subject has often been discussed before this Society, the members of which are also familiar with descriptions of the road across the plains of Turkistan to Kashghar, I will therefore pass on to grounds of which less is known.

At Kashghar we were most hospitably and kindly entertained by the Amír Yakoob Khan. It is melancholy to reflect on

what has occurred since the time of our visit. Yakoob, our then host, is dead, and the whole of the kingdom of which he was then in undisputed possession, extending from Tashkurghán to Turfán, is now in the hands of its former masters—the Chinese—who, as is their universal custom in the case of a suppressed rebellion, are believed to have massacred the whole of the adult population of the country.

During our winter's stay in Kashghar, while other members of the Mission were employed in negotiations, in politics, and in the study of the history, resources, and statistics of the country, my own time was fully occupied in astronomical, meteorological, and magnetic observations, and in the collection of geographical material. The results can be studied in detail in the Appendices to the Report I submitted to the Government of India.

My observations for latitude and longitude were taken with a six-inch transit theodolite, by Troughton and Simms—a capital instrument, of which we have a specimen on the table this evening. A similar one was carried with me on all my wanderings—a distance of more than 3000 miles—carefully packed and carried on a pack-saddle over the highest passes in the world, through deserts and through floods; and although I have observed with it at temperatures varying from each other by as much as 100° Fahrenheit, I have never found it work badly, and I never once had occasion to clean the axis during the whole period of my absence.

During the winter in Kashghar I was permitted to make two excursions in the neighbourhood, both of which have enabled me to add something to our geographical knowledge.

During the first of these trips, which occupied us from the 31st of December to the 10th of January, Dr. Stoliczka and myself, under the orders of Colonel Gordon, visited the Russian frontier at Lake Chatyr Kul, about 110 miles north-west by north of Kashghar. The road followed was the caravan-road from Kashghar to the important Russian military centre of Almaty or Vernoye. The road had been strongly fortified by the Kashgharians, as it was the most likely line to be taken by an invading Russian force.

I succeeded, with no little difficulty, in keeping up a continuous route survey, and took observations for latitudes at four points on the line of march, the most northerly being at Turgat Bela, on which occasion, while observing, the thermometer stood at 10° below zero (Fahrenheit), and an intensely bitter wind was blowing. Later on the same night the thermometer fell 16° lower, while inside the *akoee* (Kirghiz tent), where we slept, it was as low as 8½° below zero.



It may be imagined that taking star observations in the open, with the thermometer standing below zero, is not a very pleasant occupation. After handling the instrument for a short time, the sensation, so far as one's fingers are concerned, ceases, and during a set of observations it is necessary to rush frequently into the adjacent tent to restore circulation over a fire. The recorder, on such occasions, nurses the hand lantern with great care, and although the ink is placed inside the lantern, yet it would freeze on the pen between the lantern and the paper. I was eventually obliged to allow a pencil to be used on such occasions. My faithful Madras servant "Francis" also experienced no little difficulty in getting the lamps to burn properly. The oil becomes very thick from the cold. The air-holes had to be carefully enlarged for high altitudes, so that while admitting more air, they might still be small enough to prevent the high winds which were frequently blowing, from extinguishing the light.

We left Yangi-shahr (the new city of Kashghar), and, going northwards, crossed the River Kizyl by a good wooden bridge. On our left lay the old city of Kashghar, beyond which we crossed the River Taman. These two streams meet to the east of the town, and form the Kashghar Daria. At the time we passed there was but little water in either stream, that little being frozen, so that it was impossible to form any idea of the size of the vast mass of water that must come down in the summer time. The left bank of the Taman is covered by tanneries and cemeteries; the road enters a narrow lane between two mud walls, on either side of which are inclosed gardens, fields, and hovels. These continue for some four miles, when the road emerges on to an open stony plain forming a very gently rising slope up to a small spur from a low range of hills, running nearly due east and west, through a gap in which, formed by the River Artysh, the road passes. On the north side of the range is the wide and fertile valley of the Artysh, a name given to the whole district, which consists of several small townships scattered over the valley, in one of which we put up for the night.

Crossing the Artysh Plain the road enters the Toyanda Valley, about 2 miles wide, and here we may be said to have fairly entered the Tian Shán Mountains. In marching up this open valley we had in view to our left the sharp serrated edges of the Ming-yol Hill, a prominent object in the panoramic view from the roof of the Embassy buildings in Kashghar; in front of us lay a range of snow-covered peaks; these formed part of a small range running parallel to the main chain. A little farther on through a broad open valley we reached the

picturesque camping-ground of Chung Terek, a Kirghiz village, where were a number of *akooes* pitched for our reception. From this place the scenery gets much bolder, and the road passes between precipitous hills rising to a height of some 3000 feet above the valley, through which a march of 20 miles brought us to the Chakmák Forts, where very strong fortifications had been erected for the defence of the frontier, and where the overhanging heights are so precipitous and inaccessible that it would be almost impossible for an enemy to effect a lodgment.

There are two roads over this range of hills converging on a point a few miles north-west of the Chakmák Forts—one from the Suyok Pass, two days' journey in a north-west direction, is little more than a path, and cannot be traversed by horsemen; but the other from the Turgat Pass, about 30 miles to the north of the junction, is now the main caravan-road between Kashghar and the Russian settlement of Almáty (Fort Vernoye), and may be said to be practicable all the year round, although somewhat more difficult, perhaps, in summer, when there is much more water in the River Toyanda, which has to be crossed some forty times in the course of the journey.

From a ravine lying to the south of the Chakmák Forts a road runs across the hills to the Terekty Fort, nearly due north of Kashghar. It lies on the shortest road between the Náryn Fort (Russian) and Kashghar *viá* the Bogushta and the Terekty passes.

For 25 miles above Chakmák, the road continues gently ascending along the course of the frozen stream, passing through volcanic rocks, to Turgat Bela, a little short of which the nature of the country alters, and the precipitous hills are replaced by gently undulating grassy slopes, abounding with the "*Ovis Poli*."\* These extensive grassy slopes, somewhat resembling the English downs, are a very curious feature of the country, and not only attract the Kirghiz as grazing-grounds for their cattle, but are equally sought after by the large herds of Guljar, in one of which Dr. Stoliczka counted no less than eighty-five. The weather was now intensely cold; Colonel Gordon got his fingers frost-bitten from the cold contact of his rifle, and when I stopped for a few seconds on the top of a ridge to get a view of the country, and to record the reading of my aneroid, my hands and feet became entirely numbed.

The valley had now gradually risen till at Turgat Bela we had reached an elevation of 11,030 feet above the sea. We

\* The *Ovis Poli*, or guljâr, as well as the ibex, abound in these hills in such large quantities that they form the principal food of the garrisons of the outposts. At Chakmák we saw a large shed piled up to the roof with the frozen carcasses of these animals.



rode thence to the Chatyr Kul Lake, and back to camp the same evening (about 32 miles). Starting early in the morning with the thermometer several degrees below zero, we rode 13 miles to the pass up a gentle ascent through a broad and open valley, until within a mile of the crest, where the slope, though still very easy, is somewhat steeper. On the left of our road was a range of lofty, bold, precipitous peaks. On our right were low undulating hills, extending away eastward as far as we could see. On reaching the pass (12,760 feet) we did not immediately see the lake, but had to advance for about 3 miles in a northerly direction, when we came suddenly into full view of the whole lake and the range of mountains beyond, a magnificent panorama. There are two nearly parallel ranges of mountains—the Turgat, on which we stood, and the Tásh Rabát to the north—both portions of the Tian Shán Range, which westward, like the Kárákorum eastwards, seems to lose its identity and merges into several comparatively unimportant chains, of which it is impossible to say which is the main one. The Chatyr Kul lies between these two ridges. There is no drainage out of it, but several small streams run into it. The Russian maps include the lake within their boundary, which they place on the crest of the southern or Turgat Range, the peaks and passes of which are of about the same average height as of the northern range. The Aksai River, which rises a few miles east of the lake, flows into East Turkistan, while the Arpa, which flows from a corresponding position near the west end, finds its way into the Syr Daria.

The lake is about 1700 feet below the pass.

Of course from a single view of the lake and the mountains beyond it, it was impossible to form any accurate idea as to their size, but according to the Russian maps the lake is of oblong shape, about 14 miles in length, and 6 or 7 in breadth at its widest part. The lake was covered with ice, and the sleet which lay on the surface made it difficult to distinguish its edge from the nearly level plain by which it is surrounded, which was covered with a white saline efflorescence. A single horseman near the edge was the only living object visible, a curious contrast to the Kashghar side of the pass, where, within a few miles of the crest, we had seen a herd of several hundred ponies grazing at the foot of the precipitous hills before alluded to. These animals belonged to Russian Kirghiz, who, during the winter, were allowed to graze in Kashghar territory on payment of certain fees for permission to do so.

The caravan-road which we had followed from Kashghar lay across the plain in front of us. Beyond it is the Tásh Rabát Pass, about the same height as the Turgat, but somewhat more

difficult. A traveller who had crossed it in March told me that the road was then very bad, and difficult for equestrians; but I think his account must be somewhat exaggerated, as the camel-caravans from Almáty traverse it without much difficulty. Between the Russian Fort of Náryn and Kashghar, a distance of 180 miles, there are only these two passes—both about 13,000 feet in height. When we visited the country early in January there was no snow on the ground; but we were singularly fortunate, for a traveller two months later complained of a good deal of snow, while Baron Osten Sacken wrote on a former occasion that his party suffered much from cold and snow in July.

There is a shorter and more direct road between Náryn and Kashghar, said to be not more than 134 miles in length, or eight days' journey. The passes, though all about the same height, *i.e.* between 12,000 and 13,000 feet, are more difficult than on the ordinary caravan-road, and it is seldom used by traders. It is protected on the Kashghar side by the Terekty Fort. We never had an opportunity of visiting this fort, which lies nearly due east of Chakmák, and due north of Kashghar; and although we must have passed within a few miles of it during a subsequent trip in the Artysh districts, so jealous were the officials lest we should learn too much, that my guides studiously avoided pointing it out, and actually on one occasion even denied its existence. The distance between Fort Náryn and Vernoye is 180 miles by the shortest road, which goes over three passes, all between 12,000 and 13,000 feet in height.

We had hoped that we should have been able to return to Kashghar, over the undulating plateaux to the east of the Turgat Pass, and by the Terekty Fort, but we had now to retrace our steps to Kashghar by the road we had come. A notice of the return-journey is therefore unnecessary.

I may mention that I have now twice crossed the Russian frontier without a passport; the first time in a friendly manner on the expedition just described. My second visit was in September and October last year, when I accompanied the Turkish army under Kurt Ismail Pasha, and was encamped for two months in Russian territory near Mount Ararat.

Whilst our party under Colonel Gordon was visiting the Chakmák Forts, another member of the Embassy, Captain Bidulph, paid a visit to Marálbashi on the direct road to Aksú. An interesting account of his journey will be found in the volume of the Yárkand Reports.

My second excursion was to the north-east of Kashghar. Although only absent for a fortnight, Dr. Stoliczka and myself succeeded in traversing 340 miles of road; first of all travelling



in the Artysh districts in company with the Envoy and his party, and then making a rapid detour to the Belowti Pass, about 150 miles on the direct road from Kashghar to Ak-sú. I have no time this evening to give a detailed account of the journey.\* The ground we traversed was marked on old maps as the Syrt, and represented as a high table-land, rising immediately above the plains. We ascertained, however, that it should rather be represented as a series of parallel mountain-ranges, between which, and running parallel to them, are extensive level plains, very little higher than the plateau of Eastern Turkistan, but gradually rising towards the north and sloping down towards the east. Thus the Túghamatí Plain, about 45 miles north of Kashghar, is about 2000 feet higher; while the Jai Túpa Plain, the same distance east of Túghamatí, is only 1000 feet higher than Kashghar.

These large plains have in most cases much grass and fuel, though but little water. They are inhabited by wandering tribes of Kirghiz, who live almost entirely on the produce of their flocks and herds. In the time of the Chinese these people appear to have led a more jovial life than at present. Under no master, they used regularly to levy black-mail from passing travellers and merchants at every camping-ground; and as prompt payment always insured a safe passage, there was seldom much difficulty in collecting their dues. Under the strict rule of the Amír they are now disarmed, and are comparatively poor, as they dare not venture on any of their old tricks. A single sepoy, selected from among themselves, is stationed in each encampment, and is responsible for the good conduct of its members; an annual present of a choga, a certain amount of grain, and remission of taxes, is the remuneration he receives from the State. The Kirghiz pay as taxes annually one sheep in forty, one sheep for every two camels, and one-tenth of the agricultural produce (when there is any). In these parts horses or ponies are scarce. Nature aids the inhabitants in their poverty by a plentiful supply of a plant called locally *kuruk* or *teric*, a kind of millet which grows wild, and from which they make a preparation called *talkan*, corresponding to the Ladákhi *suttoo*, which they eat uncooked, moistened with a little water. I tried some, and found it to be not unlike Scotch oatmeal, and, as it may be had for the picking, it may be looked upon as a bountiful gift of Providence to these otherwise poverty-stricken people.

The Artysh Valley, which we passed through on our way to the Syrt, is a much richer and more populous country. We

\* The reader who seeks more information on this subject is referred to the volume of the Yárkand Reports, pp. 253-261.

had already passed through its western extremity *en route* to the Chatyr Kul Lake, and we found the village of Altin Artysh partaking of the same character as nearly all the villages we have seen in East Turkistan, consisting of a number of small hamlets, scattered about the plain, at intervals from each other varying from a quarter of a mile to a mile. Each hamlet consists of a number of scattered farm-houses, each farm having its separate irrigation-canal, its trees, its fields and out-houses, and forming the residence of a family, containing generally from four to a dozen souls. In a central position is the bazaar, with long rows of stalls on both sides of the road, somewhat resembling that of an Indian village, but absolutely untenanted except on the weekly market day. Altin Artysh consists of 9 hamlets, containing about 3000 houses.

The one difficulty throughout East Turkistan is want of water, and one cannot help admiring the ingenuity with which the inhabitants have made the best use of the scanty supply of this precious fluid. Where there is a sufficiency, the country is one close network of irrigation-channels, and in the spring, in these places, one unbroken mass of trees and verdure testifies to the excellence of the system. In the Artysh Valley there is water in moderation, and, as far as I could learn, nearly every drop available in the spring and summer is used in irrigation. In the winter, one sometimes comes across tracts of marshy land, but these are generally caused either by springs which rise in the neighbourhood, or by leakage from canals in autumn, at which time the water is no longer required for irrigation, and the saline nature of the soil causes breaks down, and consequent leakage, which it is not considered worth while to repair until the following spring.

We had rather a rough time of it on this journey, and on one occasion, having unwisely gone ahead of our baggage, we did not reach our intended camp till dark, after a march of fully 32 miles, through a very heavy sandy road, which so delayed the mules carrying our baggage that they did not arrive till eight o'clock the next morning, having stopped over night exhausted in the jungle, about 5 miles short of our camp. Fortunately, we found an old Kirghiz Musjid, in which we went dinnerless to bed, protected, however, from the wind, and from the snow which fell during the night. The officials at the headquarters' camp had assured us that we should find Kirghiz and supplies at this place, but there were neither one nor the other, and the Diwan Begi, who accompanied us, spent his whole night (after his day's ride) in hunting up Kirghiz, with whom he returned about daybreak, bringing supplies for man and beast, both of whom had fasted for at least twenty-four hours.



The cold, too, was sometimes intense. At one place the thermometer outside the akooe stood at 16° below zero when I rose in the morning. This great cold was, I think, in great measure attributable to the presence of saline matter in the soil, for our elevation was not much over 1200 feet above Kashghar, where the corresponding temperature was very much higher.

The furthest point we reached on this journey was the Belowti Pass, on the range that separates the large grassy plateaux we had been traversing from the valley of the Aksai, or Kokshal River, which, rising east of Chatyr Kul, flows nearly due east to Úsh Túrfán and Áksú. The Pass is 11,500 feet above the sea. From it no high peaks were visible, probably none rising more than 1000 feet above the Pass. The neighbouring hills were undulating and grassy, very much resembling those to the east of the Turgat Bela Pass, in the same range. It was evident that this range, as it advanced eastward, became considerably lower both as regards its peaks and watershed. Like the smaller ranges at its base, and parallel to it, I believe it to get lower still as it passes further east, and at last to be lost in the plains near Áksú.

As the result of this journey many considerable alterations were made in the then existing maps, which proved utterly useless. The country we traversed had never been previously travelled over by a European, and I have had to shift the position of the large town of Áksú 40 miles to the east of its place in former maps.

Shortly after our return to Kashghar from the Artysh districts, arrangements were made with the Amír by Sir Douglas Forsyth for the despatch of a party of the Mission to Wakhán—an eastern dependency of the Amír of Afghanistan.

Although our journey was a very hurried one, and necessarily performed at a most unfavourable season of the year, we were most grateful for the opportunity afforded us of visiting a country which has never been travelled over by a European since the days of Marco Polo and Benedict Goetz, and to which in the eyes of modern geographers an almost sacred interest has been made to attach by the accounts of ancient and mediæval travels which Colonel Yule and Sir Henry Rawlinson have so prominently brought before the public.

This little known country has always been the great barrier between Eastern and Western Asia—and as in ancient days it separated our Arian ancestors who inhabited the valleys in its western slopes from the Turanian races, who originally came from the plateaux of the Tian-Shán, so even now we find in the valleys of Wakhán and Badakhshán, and other hill countries

at the sources of the Oxus, that the language spoken is nearly akin to Persian; while on the eastern side of the mountains, the language spoken is a very pure dialect of Turkish, which also is the language spoken by all the Kirghiz nomads that we encountered in the Tian-Shán, north and north-east of Kashghar.

Karl Ritter has described those Pámír regions as "the most remarkable point of the whole world as regards the history of humanity." All I can do in the short space of time that remains is to give a brief account of what we ourselves saw.

Our party consisted of Colonel Gordon, Captain Biddulph, the late Dr. Stoliczka, and myself. We left Yangi Hissar on the 21st March 1874. Our first day's march brought us to the foot of the mountains, although the characteristic haze which often envelopes the Turkistan plains for days on end, had for some days previously entirely obscured the said mountains from view. This haze stuck to us most persistently for several days, and we only left it behind us on the fifth day, on crossing the Kaskasu Pass, 12,930 feet above the sea-level. Our road to this point lay continuously up the Valley of the Kinkol River—sometimes narrowed and hemmed in by almost perpendicular rocks—sometimes opening out into level tracts covered with grass and brushwood, and inhabited by Kirghiz tribes, who spend the winter in these lower valleys, and rise gradually to higher ground as the summer advances. On the day we crossed the pass there was a great deal of deep snow both on it and on the grassy slopes on either side. Although the march was only ten miles, the baggage ponies did not arrive in camp until late in the afternoon, owing to the slippery and dangerous descent on the south side, where our loads had all to be transferred from our ponies to yâks, supplied by the Kirghiz for the purpose.

These yâks, or mountain oxen, are wonderfully safe and sure-footed in crossing snow and ice; and one feels far more confident on the back of a yâk than even on one's own legs.

The view from the pass was very limited, and disappointing, and the deep snow prevented my leaving the road to try and get a better.

On the sixth day we had another pass to cross, 13,130 feet in height, and bearing the appropriate name of Torat, or Horse's Sweat; the ascent on one side being a very steep one, of 3000 feet, the fall on the other side being 4000 feet. While we were on the top the sky was cloudy, and a fall of snow obscured the peaks to the north. On the return journey, however,—five weeks later—the ground being then free from snow, I ascended a hill north of the pass, and had a good,



though limited, view in every direction. The ground rapidly rises to north and north-west; peaks in the neighbourhood rising to 17,000 or 18,000 feet.

The two mountain ranges we had now crossed, as well as a third which we traversed two days later, were, as far as I was able to form an opinion, spurs from the Kizyl Yart Range to the north. The streams passing between them flowed in a south-east direction, ultimately falling into the Yárkand River. The mountains are bare and unproductive—grass lies on the tops of the more undulating hills, while stunted birch and willow, and occasional juniper-trees are the only produce of the valleys. The road throughout was bad, and after passing the Torat Pass execrable. In one place it followed the bed of the stream—over large boulders, and deep holes of water—vast perpendicular rocks almost closing in the valley on both sides. A few determined men might here defend the road against an army. In the winter this passage is easier; but when we passed we had the double difficulties of ice and water to contend with. In summer the road is rendered quite impassable by floods from the melting snow, and an alternative road is then taken over the mountains, which in winter is covered by deep snow.

After the passage of the third, or Chickiklik Pass, 14,480 feet, our road descended the stream from the pass to its junction with the Tashkurghán River at Shindi, a small village of fifteen houses, situated in a well-cultivated valley, about two miles long by one broad. The road then passes up along the right bank of the Tashkurghán stream through a very wild defile of crystalline rocks, which forms almost perpendicular banks about 2000 feet in height, along which the river winds its way with a most tortuous course. After traversing these mountains for about 10 miles, the road suddenly emerges on to the Sarikól, or Tashkurghán Plain; a few miles farther on, over a broad open valley, and we reached Tashkurghán, or the "Stone Fort," the residence of the governor of the district.

We had now been travelling for ten days through the wild, sparsely inhabited mountain masses which lie to the west of the Turkistan plains, and found ourselves on a large open grassy plateau, some 10,500 feet above sea-level, surrounded by mountains, and well watered by a large stream flowing down it from the snowy range visible some 50 or 60 miles to the south.

This Tashkurghán Plain, or rather valley, extends apparently from the feet of the Hindu Kush passes on the south, up to a low ridge some 8 miles north of Tashkurghán. This ridge

separates the plain from another nearly equally extensive plain, that of Tagharma, on the north. The average breadth of the former is about 4 miles; and it, as well as the Tagharma Plain, is bounded on east and west by continuous ranges of snow-covered mountains.

On our return journey I was able to lay down the borders of the northern plain with considerable accuracy. Practically, the two form one large plateau, divided in the middle by a low range of hills, through which flows the Tagharma River. The northern plain extends from the dividing ridge for about 12 miles in a north north-westerly direction; it then narrows, being nearly closed up by spurs running down from the mountains, east and west. About 10 miles west of this point is the Birdash Pass, over a range which divides this plain from another similar one, that of Ak-Tásh, or Aksú, which runs nearly parallel to it. Opposite the Birdash Pass the plain again widens and extends, gently undulating for some 8 or 10 miles farther in the same direction. According to the statement of the Kirghiz, it continues right up to the neighbourhood of the Kizyl Yart Pass, which separates it from the Alai, and the Valley of the Surkhab River, the most northerly tributary of the Oxus.

Tashkurghán was once upon a time a flourishing Tajik settlement under a hereditary ruler of its own—one Alif Beg—who used to pay a nominal tribute to the Chinese, and receive in return valuable presents in bullion, which were regarded as a subsidy for the military protection of the frontier and of the road to Badakhshán. In 1868, some years after Yakoob had seized the throne of Kashghar, he invaded this country and carried off nearly the whole of the inhabitants to Kashghar; partially replacing them by Kirghiz, on whom he thought he could place more reliance. A few hundreds of the original inhabitants had recently been allowed to return, and I heard many a heart-rending tale of their woes and sufferings. The villages have nearly all tumbled into terrible disrepair; as the comparatively few Kirghiz who dwelt in the neighbourhood preferred their felt tents to more settled habitations.

A garrison of some 300 soldiers hold the place on behalf of the Amír Yakoob. They reside in the fort, which is of very ancient date, said to have been founded by Afrasiab, the King of Turan. The "Takhsobai," or Governor, evinced so great a disinclination to receive our visit that we had to content ourselves with inspecting the fort from a distance.

The Tagharma Plain to the north presented a very lively spectacle: fully 100 Kirghiz tents were in view, scattered about in different parts of the valley; their tenants, of the Sark or Syok tribe, being subjects of the Amír of Kashghar. Open,



grassy, well watered, and speckled all over with camels, yâks, horses sheep, and goats, it formed a pleasant sight after the wilds through which we had been wandering, and was a striking contrast to the Tashkurghân Valley, which looked by comparison a picture of desolation, owing to the numerous uninhabited villages and tumble-down houses with which it was covered.

The Tashkurghân Valley is for the most part stony; but there are patches of cultivated land here and there along the banks of the stream which runs down from the Kunjud Mountains. Barley is grown sufficient for the wants of the present small population, which certainly does not exceed 2000 souls, and the country could probably produce much more than it does. There is good grazing ground near the river; a few poplars and willows are scattered over the valley.

From Tashkurghân to Panjah there are two roads commonly used by merchants; the one over the Little Pâmîr was taken by us on our outward journey. It is the ordinary winter route; the other by the Great Pâmîr was used on our return. The latter is the easier road in summer; it passes over much higher ground, and is impassable for caravans in winter on account of the deep snow which lies on it.

The road through the mountains to the west of the Tashkurghân Valley, lies up a rocky stream. On the second day's march the valley opens, and we entered a large basin with lofty mountains towering above it on all sides, very bold and precipitous, and of a very peculiar and striking ferruginous colour. A stiff pull through the snow to the top of the pass (14,915 feet), and we were standing on the watershed between Eastern and Western Turkistan.

I had been given to understand that we should here come in view of the "Pâmîrs," and was somewhat surprised at seeing in front of me nothing but a long range of low red-coloured hills about 10 miles distant, a portion of which to the right was pointed out to me as the Great Pâmîr, and another on the left as the Little Pâmîr. Nothing was visible but an irregular mass of hills whose serrated tips did not appear to rise more than 1000 feet above the pass on which I was standing. We were separated from these hills by a large valley running in a northerly direction, which subsequently turned out to be that of the Âk-sû River, the principal source, as now appears, of the Oxus. The apparent continuity of the range in front of us was, as we shall hereafter see, a delusion; the hills really form the ends of broad transverse ranges, running a westerly direction, and separating the various Pâmîr valleys, which were concealed from our view by the low hills in front.

Descending from the Neza Tash Pass a march of a few miles in a westerly direction, through heavy snow, brought us to our camp. On the following day we descended into the valley of the Ak-sú, a little north of Ak-Tásh, at an elevation of 12,600 feet above the sea. We continued south for 6 miles up the valley, which was here about 2 miles broad, and deep in snow. In front of us was a fine range of snow-covered peaks, running in a direction a little south of west, forming the southern boundary of the Little Pámír, which occupies the upper portion of the Ak-sú Valley. The latter, as we advanced, gradually turns round south-west and west-south-west, which direction it retains up to and beyond the lake of Little Pámír. This Ak-sú Valley, when it runs north and south, forms the well recognised boundary between Kashghar and Wakhán.

The Little Pámír is generally considered to commence near where we struck the Ak-sú stream, and consists of a long, nearly level, grassy valley, varying from 2 to 4 miles in breadth, and inclosed on either side by ranges of snow-covered hills, sloping down rather gently towards it. Its length from east to west is about 68 miles. The Great Pámír, and all other Pámírs are, as far as I could learn, of precisely similar character. The ground intervening between the Great and Little Pámírs, is filled up with lofty mountains of tolerably uniform height, and without any very conspicuous peaks, the hills to the west near the junction of the two main branches of the Panjah River being perhaps the highest. Our first halt in the Little Pámír was at Onkul, after a march of 25 miles for a great part of the way over snow, and with such a very bitter wind blowing in our faces, that it was almost impossible to keep our eyes open. After entering the long straight reach above the turning, near Ak-Tásh, several large open valleys are passed on the north, where the hills are comparatively low and undulating, those on the south side being generally much higher.

Our second day's march through this Pámír took us along an almost level road for 24 miles. As on the previous day, snow-covered mountains lay on both sides as we advanced, and there was a great deal of snow in the valley itself, which varied in breadth from 2 to  $3\frac{1}{2}$  miles. There was often much saline matter in the soil, and where this was the case the snow generally melted long before it did so elsewhere. Our camp was on the north edge of the Little Pámír Lake, to which the Wakhs generally give the name of Kul-i-Pámír Khurd, or lake of Little Pámír, while the Sarikólis and Yárkandis call it the Oi Kul.

As some doubts had been expressed, as to the supposed double exit from this lake, I was naturally very anxious to determine the point, and in ascending the valley on this day's march, I took,



at some twenty different points, observations with an aneroid barometer to determine, if possible, the exact watershed, which from previous accounts I had fully expected to find at the east end of the lake. The ground, however, was so level for several miles, there being a rise of only 230 feet in the 24 miles between Onkul and the lake, that the aneroid was not sufficiently delicate for the purpose, and although I walked for a considerable distance on the frozen stream to enable me to satisfy myself on the subject, I arrived in camp on the banks of the lake *re-infectá*. The following morning I walked over the lake to its east end, which from a little distance off appeared entirely closed, but on walking round the head to make certain, I was soon undeceived by coming across a very narrow outlet, about nine paces across, and only a few inches deep, all ice of course. I then walked several miles on the ice down the stream (east) until I became fully convinced that its bed did slope to the east and drain into the Ak-sú. This result being contrary to what I had anticipated, I then rode to the west end of the lake to see whether (as has always been supposed) a stream issued from that end also. I left my horse and started on foot to go round its head; the ice at this end, instead of being firm and strong, as at the other, was very brittle and would not bear my weight, so I had to wade through the heavy snow and slush on its banks. I soon came across a warm spring, from which water was decidedly flowing due east. A little farther on I encountered a frozen stream, on going along which westward the barometer showed that I was walking up hill. I advanced still farther, hoping to get completely round the head of the lake, so as to be *quite certain* that there was no outlet draining westward; but the walking in the deep snow at so great an elevation had completely exhausted both myself and the man who was with me, and it was with some difficulty that I got back to my horse, and hurrying on with no guide but the tracks in the snow left by the rest of the party, it was with great difficulty that I reached camp, 20 miles from the lake, shortly after dark, one of the hardest day's work I ever did. On the return journey, the native officer of our escort came back by this road, and, according to a promise he had made me, rode completely round the head of the west end of the lake up to the foot of the steep mountain rising on the south side. The snow was then all melted, and water was flowing *into* the lake from the two sources I have just described, and nothing was flowing out. He then went to the east end, whence a stream was flowing towards Ak-Tásh, so this problem has been solved in a somewhat unexpected manner. The lake has only one outlet, and that eastward, and its waters flow into the Ak-sú, afterwards the Murgháb, which joins the

Oxus near Wámur, and is in all probability the longest branch of the Oxus.

I have tried hard to discover the true onward course of this Ak-sú River. On our return journey we struck it some 14 miles north-north-west of Ak-Tásh. It flows thence in a northerly direction for 12 miles, and then turns off out of sight north-west. It is said to flow in a northerly direction for two marches (say 40 miles) from Ak-Tásh, after which it either joins, or becomes, the Murgháb River, changing its course westward and flowing through the Sariz Pámír to Shighnán. It passes through Bartang, a district of Roshán, and joins the River Oxus just above Kila Wámur, the chief town of Roshán.

The Little Pámír Lake is 13,200 feet above the sea-level. For a length of  $3\frac{1}{2}$  miles it is from 1 to  $1\frac{1}{2}$  mile wide; the eastern portion, about  $1\frac{1}{2}$  mile long, is very considerably narrower. Nearly opposite the south-east corner, in a side ravine, is a large glacier which drains into the Ak-sú stream shortly after the latter emerges from the lake.

The road passes along the north side of the lake and crosses the watershed 2 miles beyond the west end, at a height of not more than 150 feet above the margin of the lake. Other parts of the watershed, which is nowhere well defined, are probably still lower. The descent beyond is somewhat rapid. We went for about 7 miles down an open valley (crossing several small streams flowing down large open ravines on the north), and reached some deserted Kirghiz huts and tombs called Gombazi-Bozai, close to where a large stream, the principal affluent of the Sarhadd branch of the Oxus, comes in from the south-east.

After passing Gombaz our path lay on the right bank of the Sarhadd stream, where we met with a constant succession of steep ascents and descents. The regular path had often to be quitted in order to avoid drifts of snow, which in places lay very deep. In the winter, when the stream is completely frozen over, its hard surface makes a capital road, which is always used by travellers. We passed at a bad season of the year, too late to be able to keep to the ice with safety as it was now breaking up, and yet before the snow on the upper road was melted. Later on in the hot weather, the lower road becomes altogether impracticable, as it is impossible to cross the then swollen river. Crossing mountain streams in flood is no child's play.

Our road now lay down the main valley, and continued along its northern side over a constant succession of ascents and descents, passing occasionally through snow in deep patches. We saw on the hill-side a large number of juniper-trees, and in some of the side ravines were birch-trees and wild



roses. In fact, wherever water trickled down there were signs of vegetation, but everywhere else the hills were bare. In one or two places the road descended to the river-bank; in places the stream was entirely frozen over, the water flowing underneath, elsewhere it was altogether clear of ice. At two or three such places I estimated the breadth to be about 40 feet, depth 2 feet, and velocity  $2\frac{1}{2}$  miles per hour, temperature of water  $35^{\circ}$ . Before reaching camp was a very steep descent, having a fall of over 1000 feet, which it only took a quarter of an hour to walk down. The river is here called by various names, Kanjúd, Sarhadd, Panjah, and *Hamun*. The last name I have heard more than once, and it is of course the same as "Amú." Wakhán seems to be but little better off than Eastern Turkistan in the numerous names borne by the same river. On our seventh day's march we had to cross the main stream many times where it passed through very steep hills. We crossed generally over ice and snow bridges. At last we emerged into a large open gravelly plain, watered by several streams, and arrived at the village of Sarhadd, the highest inhabited village of the Wakhán valley, and situated about 11,000 feet above the sea. The march was only 11 miles, but difficult. We were here met by Ali Murdan Shah, the eldest son of the Mír of Wakhán, who had marched out from Kila Panjah to meet us. Next day we took a very short march of only 4 miles to the large village of Patuch or Patur. This march was, while it lasted, the most trying I have ever experienced, owing to the intense bitterness of the cold wind and drifting snow which blew in our faces the whole way.

From Patuch to Kila Panjah, the residence of the Chief of Wakhán, there is not much of geographical interest to notice. The road, about 50 miles in length, lay along the valley of the Sarhadd stream, sometimes on one side of it, sometimes on the other. The valley was bounded on both sides by lofty and generally precipitous mountains, of whose height it was impossible to form any idea, as their tops and the greater part of their sides were always wrapped in clouds and mists. It was perhaps fortunate for me that for fear of exciting suspicion I was unable to use my instruments, as I know nothing more disheartening to a surveyor than proceeding for days down a valley under such circumstances. Villages were scattered all along the road on both sides of the stream. In the whole distance from Sarhadd to Panjah there are probably about 400 houses, and their corner turrets, like those in the Sarikól Valley, are evidence that the inhabitants have not fallen upon much easier times than their neighbours of Sarikól. The houses are not so good as those of Eastern Turkistan, and are apparently especially

designed to keep out the wind, which seems always to be blowing violently either up or down the valley, generally speaking from west in the morning, and from east in the afternoon. On entering a house one generally passes through the stables, containing two or three horses or cows, after which one traverses a long, winding, narrow passage, which leads to the centre of the house, which is generally very small and dirty. In the centre is a fire-place, a kind of globe-shaped stove, about  $2\frac{1}{2}$  feet in diameter, made of mud, and open in front for the passage of air and fire-wood. Above is a hole in the timber roof for ventilation. The roof is dome-shaped, supported on cross-beams resting on timber uprights, which surround the central fire-place, and help to support the side apartments which all open inwards towards the fire and to one another. Here the different members of the family reside. The larger portion of the house is given up to the females, who, somewhat bashful but good-humoured, appear to have a very good idea of keeping the men of the household in decent subjection. The males all wear brown woollen *chogas* or cloaks of country make; *pubboes* or boots of the same kind as are worn by the Ladákhis; loose trousers of the same material as the coat; and a generally scanty cotton turban; the almost universal colour of which is blue and white. The women, who are not over good-looking, but are pleasant and matron-like, dress very much like the men, and have long plaits of hair falling down the sides of their heads. There is no artificial modesty or attempt to conceal their faces. In a cottage where we took refuge, the females remained present the whole time we were there, and made some most excellent barley bread for us, kneading the flour into a cake which they plastered into the inner wall of the oven; after frequent turning a capital result was secured. Their physiognomies are very divergent, most of them have Jewish noses, but one boy I saw with a most perfect Greek profile. They all age very early, and attribute their grey hairs to the poverty of the country. The men seem affectionately disposed towards the females, always handing them fruits, sweetmeats, or any little trifles we might happen to give them. They are all poor: money and ornaments seem almost unknown, and hardly anything is seen in their houses that is not the produce of the country.

In many places along the valley, tributary streams have brought down immense quantities of stones and *débris*, which threaten to block up the main stream. This *débris* generally spreads in a fan-like shape from where the tributary stream opens into the main valley, and causes the river to flow round the base of the fan. At Bábátangi the valley, which from Sarhadd had varied from 3 miles to 1 mile in width, is confined by



precipitous mountains to a breadth of about one-third of a mile. It soon expands again, however, and shortly after leaving Sas (about 13 miles above Panjah) it enlarges considerably, and gradually opens out into a considerable plain, being joined a few miles above Panjah by the valley containing the stream from Great Pámír. Before the junction the Sarhadd stream passes for several miles through rather dense jungle composed of red and white willows.

On our march into Zang (near the junction of the streams) we crossed the river of the Great Pámír, here about 30 feet wide, 1 foot deep, with a velocity of about 3 miles per hour. It was very considerably smaller than the river we had followed from Sarhadd. Where the streams meet, the valley is about  $3\frac{1}{2}$  miles wide and almost entirely covered with jungle. It narrows gradually towards Panjah, where it has a breadth of 2 miles. The height of Panjah above the sea I found to be but little more than 9000 feet. The vegetation in the valley was very backward, much retarded doubtless by the violent winds which tear up and down with a bitterness difficult to imagine, unless they have been felt. The grass was beginning to show signs of sprouting in the middle of April, and the cultivators were then commencing to turn up the soil preparatory to sowing. The Oxus River flows on the north side of the valley, and on its left bank is Panjah, between which and the mountain range to the south, a distance of nearly 2 miles, the ground is almost completely covered by fields, irrigated by a stream which issues from a large ravine on the south, and is derived from a large glacier which entirely blocks up the valley in which it is situated, and whose foot merging into a snow-bed, is not more than 1000 feet higher than the Oxus Valley.

At the head of the ravine containing this glacier are some snowy peaks, about 6 miles to the south,\* which I estimated to be between 17,000 and 18,000 feet in height; they appeared to be on spurs of the Hindu Kush Range. It was most annoying being shut up at the bottom of a deep valley, and unable to get a nearer view of these peaks; but there was no help for it, the ravines entering the main valley from north and south were generally inaccessible, the one on the south being, as I before mentioned, blocked up by an enormous glacier, which was quite impassable, while those on the north are almost vertical chasms which looked as if the mountain had been split up by an earthquake. During our stay at Panjah, I ascended the mountains

\* Their exact distance I was unable to determine, as they could only be seen up the ravine, which is too narrow to permit of a base being measured across it of sufficient length to enable an accurate estimate to be made of the distance of the peaks.

to the north to a height of about 3000 feet above the valley only to find that I was on the lower portion of a much higher range behind, which obscured all view farther north, while the hills to the south of the Oxus were so high, that they intercepted the view of any peaks on the main range of the Hindu Kush that might otherwise have been seen beyond; in fact I could see very little more than from the ground below. On the only other fine day that we had during our stay at Panjah, I went down the valley for about 12 miles, but saw little more than one or two peaks of the range to the north.

Panjah itself is, or rather was, built on five small hillocks, hence, perhaps, is derived its name\* from the place, and not the place from the river. These five hillocks are situated near each other on the left bank of the stream; the largest is covered by a fort, the residence of the Mir, Fateh Ali Sháh, and most of his followers; another is of nearly equal size, covered by houses, and surrounded by a strong wall; on two others are small fortified buildings, while on the fifth there are nothing but ruins and graves. These fortified buildings (in one of which resides Alif Beg, ex-ruler of Sarikól) from their near proximity to each other, and commanding situation, form a position of considerable strength, and might hold out for some time against an attacking force unprovided with artillery. The Mirs of Wakhán have more than once held out in this stronghold against the forces of the Ruler of Badakhshán to which country they are subject. The whole population of Panjah does not exceed a hundred and fifty souls.

\* "Panj" is the Persian for "five." One possible derivation of the word Panjah is given above. Some authorities would derive the word from the five rivers which are supposed to form the head-waters of the river on which Kila Panjah stands. There are two objections to this theory:—

1st.—It is contrary to the custom of Turkistan to name a place after a river, and to a hundred cases that I know of where the converse holds good, i.e., a river named after a place on its banks, I do not know a single instance of a place being named after a river.

2nd.—The word is usually pronounced *Panjah*, which is nearer in sound to the Persian word "Pinjah" or fifty. The true origin of the word I believe to be from the Panjah or palm (of the hand) of Hazrat Ali (the son-in-law of Muhammad). In a building on a small hill about two miles to the south of Kila Panjah is a stone bearing the impress of a hand. Local tradition says that when this country was in the hands of the Zar-dushtis, or atash-parast (fire worshippers) the people were converted to the religion of Muhammad by a visit (in the spirit) from Hazrat-Ali, who left his mark on the stone as thus described, which is an object of religious veneration in the neighbourhood. At Bar Panjah in Shighnán is a similar mark over which the Fort "Bar Panjah," "over the Panjah," has been built. Possibly this tradition has something in common with that which attributes the derivation of the word Pámír to "Pa-e-Mír," i.e., the foot of the Mir Hazrat Ali. I would myself be inclined to derive the word from "Pam," the Kirghiz word for roof, and "yer," which is both Turki and Kirghiz, for "earth" corresponding to the Persian word "Zamín." Bam-i-dunya or "roof of the world" is a name by which the Pámír is well known.



The district of Wakhán has been described by former travelers. It comprises the valleys containing the two heads of the Panjah branch of the Oxus, and the valley of the Panjah itself to Ishkashím. The northern branch of the Panjah has its principal source in the Lake Victoria in the Great Pámír, which, as well as the Little Pámír, belongs to Wakhán. Both of the Pámírs were thickly inhabited by Kirghiz in former years, subject to Wakhán, but they are now unoccupied, the constant feuds between the Shighnis, the Wakhis, the Kirghiz of the Alai, and the Kunjudis, having rendered the country quite unsafe. The highest inhabited village in the northern valley is Langar Kish, only a few miles above the junction, and on the right bank of the stream. The Sarhadd Valley (the southern branch) is inhabited from Sarhadd downwards, and there are villages scattered along the banks of the Panjah River down to Ishkashím. Wakhán is divided into four "sads" or hundreds, *i.e.* districts, and contains an estimated total of 550 houses, and a population of about 3000 souls.

I must now describe the work of the *Múnshi*, an assistant surveyor, who accompanied me from India, and who left our party at Kila Panjah, and followed the course of the Oxus through Wakhán for 60 miles to Ishkashím, thence turning northwards he followed the same river for nearly 100 miles further, passing successively through the districts of Gháran, Shighnán, and Roshán, countries which have hitherto only been known to us by name. He ultimately returned to India *via* Kabul.

The small State of Ishkashím forms, together with Zebák, one of the numerous petty feudal States tributary to Badakhshán. The present ruler of both these small districts is Sháh Abdul Rahim, a Syud of Khorassán, who was placed in power by Muhammad Alum Khan, the late Governor of Balkh. The present territory of Ishkashím extends for about 16 miles to the north of the village of the same name, which contains about forty houses, and consists, as is generally the case in those parts, of numerous scattered farms. There are small villages throughout this district on both banks of the Oxus; Sumchún and two others on the right bank, and Yákh-duru and Sar-i-Shákh on the left. These belonged to Sad Ishtagh, which was once a separate principality, but is now a district of Wakhán.

The road from Ishkashím runs along the left bank of the river up to 6 miles beyond Sar-i-Shákh, where the river is crossed by an easy ford. In the month of May the water flowed in a single stream, which was  $3\frac{1}{2}$  feet deep, and about 200 yards in width. In summer it is impossible to cross the

river at this point, and a very difficult path leading along the left bank is followed. Down to it the valley is open, 4 or 5 miles in breadth and richly cultivated. The ford marks the boundary between Ishkashim and the district of Kucheh Gháran or "narrow caves," which has been for centuries famous for its ruby mines.

The Gháran country extends along both banks of the Oxus for about 24 miles, and was once upon a time rich, flourishing, and populous. Remains of large villages exist on both banks, and bear witness to the oppression that has been exercised by successive Governors of Badakhshán. The fields near these deserted villages are now cultivated by the inhabitants of the neighbouring districts of Rágh and Sar Gholám, subordinate to Badakhshán, and said to be distant from the river a long day's journey, and separated from it by a range of hills which runs parallel to and on the left bank of the river.

The first of these large deserted villages is about 4 miles below the ford, and is called Barshar. A little beyond it a large stream enters the Oxus from the east, deriving its name, the Boguz, from a village of some thirty houses situate 10 miles up the stream. From this village a road goes to the Shákh-darah district of Shighnán. Near the junction of the Boguz with the Panjah, the road crosses to the left bank of the river. Nearly opposite to Barshar is a ravine by which a road goes over the Aghirda Pass to Faizabad, the chief town of Badakhshán. This road is said to be open all the year round. Throughout the remainder of the Gháran district, numerous ruins are passed on both sides of the stream, the largest of which, Shekh Beg, on the right bank, must formerly have contained about 200 houses. On the same side of the river, some 16 miles below Barshar, are the celebrated ruby mines, once the source of considerable wealth to the Rulers of Badakhshán, but now apparently nearly exhausted. These mines have, until lately, always been worked for the immediate benefit of the Governors of Badakhshán. At the present time some thirty men are employed there. It was said that during the past year one large ruby, about the size of a pigeon's egg, was found, and sundry smaller ones; the whole of them were sent to the Amír.

The rubies are found in a large cavern, to which there are three entrances, situated about 1000 feet above the river, and about a mile up the hill-side; the task of excavating appears to be not unattended with risks, as three workmen were recently killed, having fallen from the rocks while searching for the precious stones. There is a peculiar kind of soft white stone which is found embedded in the harder rock, and in this the rubies are found. In former years the inhabitants of Gháran,



who worked these mines, paid no taxes and held their lands rent-free; but now numerous deserted villages prove the possession of the mines to have been a curse rather than a blessing to the inhabitants of the valley, who have from time immemorial been under the direct rule of the Chief of Badakhshán.

Above the mines is a small village called Koh-i-Lal or "Ruby Mountain," and about 1 mile below them, on the opposite bank of the river, is the large deserted village of Shekh Beg, whose ruined houses are built with lime and stone. A small river enters at Shekh Beg, on the left bank, and 4 miles up it lies the village of Gháran Bálá, said to contain about 100 houses, invisible from the river. A few miles below Shekh Beg, on the right bank of the Panjah, is the village of Garm Chashma (hot springs), where a large stream of warm water joins the main river. On the banks of this stream the Munshi saw twenty or thirty men employed in washing the sand for gold. They were Badakhshís, and farmed the washings of the Gháran district for rupees 200 per annum,\* paid to the Ruler of Badakhshán. It is only within the last two years that gold has been found in this district.

Three miles beyond this is the Kuguz Parin, the boundary between Gháran and Shighnán. The road throughout the Gháran district lies along the banks of the Panjah, and is in places very difficult to traverse. The valley near Barshar contracts to about 1 mile in width, and the road runs over large boulders alongside the river, which flows between nearly perpendicular banks; the stream is narrow and swift, being not more than 200 feet across, and is almost a continuous succession of rapids. Throughout the district the Panjah Valley is nowhere much more than a mile in width, and is confined by very precipitous mountains; the river is everywhere deep. In Gháran, apricots of very large size and fine flavour are produced; these are held in great repute in Badakhshán. Apples and pears are met with in abundance; but little grain is grown. There is abundance of grass and fuel to be found at the various camping grounds throughout the valley. The water of the Panjah is rarely or never used for irrigation or for water mills. In the hot weather, oxen, horses, and sheep (for which the country is famous), are driven up side valleys to the tops of the mountains for grazing, returning to the valley in October in splendid condition.

Kuguz Parin consists of a tunnel passing through a mountain. On the south side, the road rises by a winding stone staircase, for a height of about 200 feet, to the mouth of the

\* About 20l. sterling.

tunnel, which is excavated through solid rock, and is about 100 paces in length, and so narrow and low, that it is impossible for a loaded horse to traverse it. The tunnel is said to have been constructed some three hundred years ago. Where the road emerges on the north side, the path is so narrow that a projecting mass of rock often precipitates animals into the foaming torrent beneath. The river is here about 150 yards in width, and flows some 500 feet below the mouth of the tunnel.\* The Shighnis boast of this place as the natural safeguard of their country, and call it their "father."

From Kuguz Parin the Oxus flows through the country of Shighnán, a State which is tributary to Badakhshán, and which extends for a distance of 60 miles down to the Darband Tower on the frontier of Roshán. This tower is situated on a high rock standing over the river, towards which it presents a perpendicular scarp of about 150 feet. The water beneath is very deep. The roadway winds round the tower,† and the ascent on both sides is very steep and difficult. The Shighnis call this place their "mother." It is a common saying in the country that if ever there should be a quarrel between Shighnán and Roshán, whichever State first seizes this tower will keep possession of both countries. The river is here barely a gunshot across, and there is no path whatever on the other side.

This country of Shighnán would appear to be richer and of much more importance than Wakhán and other districts of Badakhshán with which we are acquainted. From Kuguz Parin to Darband Tower there are numerous villages scattered along both banks of the river. These are surrounded with gardens, orchards, and well cultivated lands. The chief town, Bar Panjah,‡ is on the left bank, and, with its suburbs, probably contains about 1500 houses. The palace is inside the fort, and is built of stone. The fort itself is square, each side being about 500 paces in length. The walls are very strong, and about 40 feet high, built of clay, stone and wood. There are five loopholed towers, but these contain no big guns. There is a garrison of about 400 soldiers, who are mostly armed with swords manufactured in the country itself, and with guns, said to be made by the Kirghiz, viz., heavy rifled weapons which are fired resting on the ground, the muzzle being supported on a prong attached to the barrel of the rifle.

\* This portion of the route is not improbably the *Tangi Badascani* of Benedict Goetz.

† At the tower was a guard of soldiers from Wámur, who examine the passports of all travellers.

‡ Or "above Panjah" so named from having been built originally over a stone similar to the one at Kila Panjah, which was supposed to bear the impress of the *Panjah* or palm of Hazrat Ali.



Lead and all the materials employed in the manufacture of gunpowder are found in the country. The valley at Bar Panjah is about 4 miles wide, and contains a great many houses and gardens. The river runs in numerous channels separated by jungle covered islands. Short punt-shaped boats, similar to those in Central India, are used at the ferry. In July and August, when there is much water in the river, all travellers have to cross at Bar Panjah, to the other bank, the road on the left bank being then impracticable.

In its passage through Shighnán, the Oxus receives two considerable affluents on the left bank, the Shewa and Vacherv Rivers. The former is crossed by a good bridge, and was about 25 yards in width, and unfordable, when the Múnshi passed in May. It flows from a lake in the Shewa Pámír, a favoured pasture ground much frequented by herds of horses, sheep, and cattle from Badakhshán. The owners of these flocks are said to make payments to the King of Shighnán for the right of grazing there. The Vacherv River is about the same size as the Shewa stream, and joins the Panjah to the south of Bar Panjah. Along it lies a much frequented road from Shighnan, over the Shewa Pámír, to Faizabad.

On its right bank the Oxus receives one very large river, the Suchán, formed by two large streams, the Shákhdarah and the Ghund, which unite about half a mile before joining the Panjah. The two branches are of about equal size, and the united stream is about two-thirds of the size of the main river, which continues to be called the Ab-i-Panjah. The Suchán stream enters a few miles south of Bar Panjah. The valley opens opposite the junction to a width of about 4 miles, forming a beautiful well cultivated plain, with a good deal of pasture land, generally covered with horses and cattle from Bar Panjah, which place forms a most picturesque addition to the landscape, situated as it is on a white rock surrounded by trees and gardens, which extend uninterruptedly a distance of about 2 miles north of the fort.

Both the Shákhdarah and the Ghund rivers have numerous villages on their banks. On the former, at two days' march from Bar Panjah is the large fort of Rách, the residence of the Governor (Hákím) of the Shákhdarah district, which is said to contain about 500 houses. The Ghund Valley, the chief place on which is Chársím, is said to contain about 700 houses. Roads lie up both these valleys to the Pámír steppes. The Pámír at the head of the Ghund Valley goes by the name of Bugarúmál, and is possibly a continuation of, if not identical with, the Alichúr Pámír. The direct road to Kashghar up the valley is said to be a much easier road than that by Tashkúrhán.

At Sachary, 9 miles north of Bar Panjah, in the Shighnán Valley, the river narrows and becomes turbulent, and the road is very bad. Sixteen miles farther on is the Darband Tower before described. Beyond it lies the territory of Roshán, a dependency of Shighnán, and ruled by the same King, Yusuf Ali Khan.

Two-and-a-half miles beyond Darband is the junction of the Murgháb River with the Panjah. This is the river I have already traced from its source in the Lake of Little Pámír under the name of Ak-sú. The Panjah Valley, which at Darband is very narrow, rapidly widens to 5 miles, and would be fit for cultivation, but that the ground is frequently flooded by the Murgháb River. The Múnshi crossed the river about 200 paces above its junction with the Panjah; the stream was in three channels, and the torrent was so rapid that most of the horses lost their footing. The Panjah stream was very clear, but the Murgháb was red, thick, and muddy. The volume of the latter was considerably larger and its velocity greater than that of the Panjah. From bank to bank the width of the river-bed is about  $1\frac{1}{2}$  mile, and of this at least 1 mile was covered with water. The passage was effected with great difficulty. In the summer floods the water is said to extend from mountain to mountain, a distance of not less than 5 miles; it can then only be crossed by boats.

This river is generally called the Murgháb, but it is also known by the name of the Daria-i-Bartang, so called from the district of that name through which it flows. Three miles below the junction, on the right bank of the now united rivers, which still bears the name of *Panjah*, is Wámur, the chief town of Roshán, a flourishing place with a large fort about the same size as that of Bar-Panjah, surrounded by farms and orchards. Fruits and grain grow in abundance, and the soil is very fertile. Underlying the mountains which inclose the valley, at a distance of  $3\frac{1}{2}$  miles below Wámur is a somewhat famous rock—a soft fibrous stone—probably asbestos, which is utilized by being twisted into a wick, which, when saturated with oil, is said to burn almost for ever. From this rock, locally termed the *Fatila*, or wick-stone, the Múnshi went 2 miles farther down the river to the village of Pigish, the farthest point reached by him. At this point the *Oxus*, which from Ishkashím, a distance of about 100 miles, had been flowing due north, takes a sudden bend to the west, and going in that direction for a few miles turns apparently to the north.

The Roshán territory is divided into three districts—the Wámur on the right bank embracing the upper portion of the Oxus Valley, and containing about 800 houses. The district of



Pa-e-Khoja lies on the left bank of the Oxus, below the turn to the west before alluded to, and is said to contain about 1000 houses. It is at a long day's journey below Wámur. This district is inhabited by *Khojahs* who pay no tribute, but give their services as soldiers in time of war. The third district is that of Bartang, which lies up the river of that name, and is said to contain about 500 houses. The direct approach to this district from the Panjah Valley is very difficult, owing to the precipitous defiles through which the river passes; so that the most frequented road between Wámur and Sirich Fort, the chief place of the Bartang district, lies by the somewhat round-about way of the Ghund Valley.

The following additional information was supplied by the Múnshi:—

The country of Shighnán is sometimes called *Zuján* (or two-lived); its climate being so good that its inhabitants are said to be possessors of two lives.

Shighnán is said to have been formerly far more populous and prosperous than at present. Roshán now contains about 3000 houses, and Shighnán about as many more. The two combined could probably muster about 7000 fighting men, armed with swords manufactured in the country itself, and with guns made by the Kirghiz. In an armoury the Múnshi saw some 1500 English smooth-bore guns—many of them with flint locks—probably purchased in former years from the Afgháns. The natives prefer their own rifles to these smooth bores.

Shighnán and Roshán are subject to one ruler—Yusuf Ali Khan, locally designated the Shah-i-Shighnán, who generally resides at Kila Wámur in winter, but spends the summer at Bar Panjah. His ancestors are said to have come from Persia many hundreds of years ago, at a time when Shighnán and the whole of the neighbouring country was under the rule of the Zar-dushtis, or Fire Worshipers—then a very powerful race—many traces of whom still remain in the Oxus Valley, in Ishkashím and Wakhán. The Shah-i-Khamosh, as the leader of the Persian intruders was called, was a Mahometan of the Shiáh faith, and commenced to teach the Koran to the fire worshipping inhabitants of the country, and in about ten years' time his converts became so numerous that he was able to intrigue for the possession of the throne, and commenced a civil war, which ended by his wresting the government from Kahakáh, the then Governor of Shighnán, and founding in his own person the present dynasty. The tomb of Shah-i-Khamosh is at Bar Panjah, where it is an object of religious veneration.

The present King Yusuf Ali is intimately connected by

marriage with many neighbouring potentates—his three sisters were married—one to our ally, the late Amír of Kashghar, another to Khudoyar Khan, the late Ruler of Khokand, while the third was wife of the late Governor of Afghán Turkistan. The women of Shighnán are renowned for their beauty.

As far as our information goes, Shighnán and Roshán have always been tributary to the Mírs of Badakhshán—and since the permanent occupation of that country by the Afgháns—tribute has been paid to the representative of the Amír of Kabul. Formerly the tribute was paid in slaves, but the annual payment now consists of four horses, a small quantity of iron, and a few skins of *ghi*, or clarified butter.

The country is nearly self-supporting, and there is very little trade with any of the surrounding provinces. A certain amount of iron is exported, and foreign luxuries are obtained in exchange. The people appear to be fairly well off, and to live well, drinking very freely of a strong red wine, somewhat like curaçoa, large quantities of which are manufactured in the country from cherries. A fondness for wine is a failing very prevalent among the Shiáh, or unorthodox Mahometans of Central Asia.

At Wámur the Múnshi witnessed a game at Polo, locally termed Chaugán-bázi. It was played with a soft leather ball, and the rules appeared to be the same as in Ladákh, where it is also a national game.\* The King joined in the sport and displayed much skill, and at its conclusion hospitably entertained all the players.

I must now return to our own adventures. Our return route to Yárkand lay up the north branch of the Panjah River, which flows westward from the Victoria Lake through a portion of the Great Pámír.

Captain Biddulph meanwhile returned by the Little Pámír, with the object of visiting, *en route* from Sarhadd, the Baroghil Pass, the lowest known depression of the Hindu Kush. He successfully carried out this duty, and estimates the pass to be only 12,000 feet above sea-level.

I may mention, *en passant*, that Captain Biddulph is now the political officer at Gilgit, and has recently had considerable opportunities of extending our geographical knowledge of those still little known regions near the junction of the Hindu Kush and the Muztagh ranges.

Leaving Panjah on the 26th April (the day previous to which was the first warm day we had since leaving Yangi-Hissar, the thermometer in the shade going up to 74°, and in the sun to

\* See 'Ladák, Physical, Statistical, and Historical,' by Alex. Cunningham, 1854, page 311.



99°), we made a short march of only six miles to Langar Kish (9350 feet), the highest inhabited spot on the road up to the lake. We passed on the left the villages of Zang and Hissar, between which is a hot spring (temperature 120°) inclosed in a stone building, and said to possess valuable curative properties, for the sake of which the old Mír occasionally visits the spot. I may note that hot springs are of frequent occurrence in these mountains; some near Patuch in the Sarhadd Valley have a temperature of about 160°. These springs have a sensible influence on the temperature of the rivers they flow into, a fact which tends to neutralize any argument (such as that used by Wood) that the relative elevation of the sources of the two branches of the Oxus, may be estimated from the temperature of the streams at their junction.

Where the two Pámír streams meet opposite Zang, the united river was about 40 yards wide and  $1\frac{1}{2}$  deep, with a velocity of  $3\frac{1}{2}$  miles per hour. This measurement was taken at 11 A.M., at which period of the day the river had not attained its full size and velocity. In the hot weather, at Panjah, it cannot be forded, but is crossed by rafts made of skins.

Close by the village of Hissar (or Asshor) on a small isolated rocky hill, is the ancient fort (or kila or kalhai) of Zanguebar, which I examined in hopes of finding some relic of Zoroastrian worship. The ruined walls had, within memory, been used as dwelling-houses by the inhabitants of the neighbouring village, but I could discern no relics of antiquity, except fragments of a surrounding wall, and an arch formed by large slabs of stone resting on either side on solid rock.

At Langar Kish, a very picturesque village, a fair-sized stream from the north joined the main stream, passing through one of those characteristic fissures I have before alluded to. I tried to ascend it, but was very soon stopped by enormous boulders lying in the bed of the stream, which flows between perpendicular rocky banks. From this village we had to take all our supplies for the return journey to Sarikól, and as collecting sufficient even for a rapid journey was found to be a matter of considerable difficulty, we had here reluctantly to give up the idea of halting on the road, or making any detour for exploration.

The resources of Wakhán are miserably small, and we had to melt down our tent-pegs, while at Panjah, to get sufficient iron to manufacture horse-shoes for our party.

Our first march from Langar Kish was about 18 miles to Yumkhana (also called Jangalik). The road follows the right bank of the river, rising above it in several places as much as 1000 feet. From both sides occasional small mountain streams

help to swell the waters of the main river. We passed on our right several ruined huts formerly occupied by Kirghiz, who many years ago abandoned this part of the country. The descendants of the men who accompanied Wood on this same journey, driven away by the insecurity of life and property, are now many of them quietly settled, hundreds of miles away, in the neighbourhood of Kilian and Sánjú, under the rule of the Amír of Kashghar. Not a single Kirghiz, I was given to understand, remains even under the nominal sway of the Mír of Wakhán. As we advanced the valley opened somewhat, and the mountains on the south appeared to decrease in height, radiating from a pointed peak situated between the two branches of the Panjah River. After a time we came to the Ab-i-Zer-i-Zamin, a stream flowing from the north-west through banks 1000 feet in height. We had to descend to the bed of the stream, cross and ascend the opposite side, and then traverse a plain, formed by a broad terrace at the foot of the range on our left, and situate about 1000 feet above the bed of the Oxus. Four miles after passing the Zer-i-Zamin River we reached our camp, where some springs and rich soil had combined to produce a profusion of grass and fire-wood. From our tents we had a very fine view down the valley, seeing in particular one very prominent snowy peak, probably 20,000 feet in height, situated near the head of the glacier opposite Panjah. Next day we continued along the right bank of the river, passing, after 5 miles, the Ab-i-Matz, along which is the summer road to Shighnán from the head of Wakhán Valley. This road crosses the Joshingaz, a very high and lofty pass closed by snow throughout the winter and spring, and proceeds down the Shákh-darah Valley) to Kila Rách, the residence of the Hákim of the Shákh-darah district of Shighnán. From Rách a road continues down the stream to Bar Panjah.

On our own road, 2 miles beyond Ab-i-Matz, is Boharak, an occasional halting-place of caravans, stated by our guide to be the commencement of the Great Pámír. Here the valley, hitherto  $\frac{1}{2}$  a mile across, widens into a large flat open plain,  $1\frac{1}{2}$  mile in width, said to have abounded in former years with the magnificent Pámír sheep (*Ovis poli*). Of these we saw nothing but bones and skulls. Severe murrain has, within the last few years, carried off not only nearly the whole of the wild sheep, but also of the ibex. Six miles beyond Boharak was our camp at Yol Mazar (road-side temple), 2 miles short of which is a large stream joining the river on its left bank, and of equal bulk with it. Near the camp a smaller stream entered on the right bank. I ascended this for some distance, and found an open grassy valley, in which there were some huts in



ruins and some obvious traces of former cultivation; it was doubtless once the residence of Kirghiz. At our camp, which was at an elevation of about 12,300 feet above the sea, there was plenty of fire-wood and grass; this was the highest point in the valley at which good fire-wood was found, although farther up, and throughout this Pámír, there was abundance of "boortsee" and grass. Two inches of snow fell at night, but the morning, though cold, was fine.

We were now fairly in the Great Pámír; the grassy valley, about a mile broad, was bounded by terraces formed by low spurs coming down in gentle slopes from the mountain ranges on both sides. On the 29th April we continued our march along the Pámír to Bilaor Bas. The road was excellent throughout, as in fact it was the whole way from Panjah to Ak-Tásh, although at starting there are numerous steep ascents and descents. The valley gradually widens, but the flat grassy portion is nowhere much more than a mile in width, the ascent was steady, and the road everywhere first-rate. Shortly before reaching camp we passed on our left the Ab-i-Khargoshi which flows from and through the Khargoshi Plain, beyond which, at a day's journey from camp, is the Alichur Pámír, which nominally belongs to Wakhán, but practically to Shighnán. In it lies a small salt lake, Tuz Kul, from which no water flows, and beyond which the drainage goes to Shighnán. Two days' march from this lake, *i.e.*, three days from our camp, the Alichur stream is said to fall into the Murgháb. The Alichur Pámír is reported to be higher but smaller than the Great Pámír, and to possess roads going in every direction.

On the 30th we continued along the Great Pámír for 20 miles to Mazar Tupa, the plain getting gradually wider and wider as we advanced, until a breadth of 6 miles is attained. The valley is not so well defined as that of the Little Pámír, where steep mountains bordered the plain on both sides. Here low spurs from the mountain ranges north and south run into and are hardly to be distinguished from the plain. The mountains on the south are considerably higher than those on the north, the former rise to about 5000 feet, and the latter to about 2500 feet above the river-bed, giving absolute heights of 18,500 and 16,000 feet respectively.

The next day 5 miles of very gentle ascent brought us to the west end of Wood's Victoria Lake, which, like its sister in the Little Pámír, was supposed to have two outlets. Of that to the west there could be no doubt; through a channel some 12 paces wide, a little stream 6 inches deep, with a velocity of  $2\frac{1}{2}$  miles an hour, emerged from under the ice with which the lake was covered, and flowed steadily westward. The tem-

perature of the water was 38°, and it was evident that the lake was partially supplied from warm springs. A few wild fowl were congregated near this end of the lake.

The lake runs nearly due east and west, is about 10 miles long, and nowhere more than 2 miles in breadth.

The valley in which it lies is, opposite the lake, about 4 miles broad. The height of the hills to the north I estimated at 3000 feet above the level of the lake, while those on the south were at least 2000 feet higher.

The only name by which the lake is *well-known* to the natives is "Kul-i-Pámír Kalan," *i.e.*, lake of the Great Pámír. I have once or twice heard it called "Airán Kul," or Buttermilk Lake. To avoid confusion, and to make as little possible change in existing nomenclature, I purpose calling it "Kul-i-Pámír Kalan," or "Victoria Lake," the last name being the one originally bestowed by its discoverer, Lieutenant Wood. Our camp, which was about 2 miles east of its head was called by the Wakhis "Sar-i-kul" (head of the lake), a camp in a corresponding position at the lower end being called "Bun-i-kul" (foot of the lake). This may account for the other name erroneously given to it by Lieutenant Wood (Sir-i-kól).

After reaching camp, a distance of 16½ miles, I went to the head of the lake to investigate its drainage and determine its limits (for from a little distance off it was impossible to discriminate between the ice and snow on the lake, and the snow on shore). I was soon convinced that all the water from the hills at the east end drained *into* the lake, which therefore like its neighbour in the Little Pámír has but one outlet, although in the former case the water flows west, and in the latter east. To the east of the lake the valley opens out, and forms a large basin which extends ten or twelve miles from west to east, and six miles from north to south. At the lower portion of this basin, surrounding the head of the lake, is a great deal of marshy ground formed by the drainage which enters from numerous side valleys from the hills on the south. At the time of our visit this marsh was covered with snow and ice; but later on in the season, when the snow is melting on the surrounding hills, there is much water, and the place is said to become the favoured breeding place of thousands of geese.

Our march from Sarikul lay along the northern side of the valley, the whole of which was deep in snow, and was so level that I experienced considerable difficulty in determining the correct position of the watershed, which was crossed at a distance of 21 miles from the east end of the lake and at a height of 14,320 feet. A frozen stream here comes down from the north,



divided into two portions by a low ridge of gravel, one flowing eastward into the Ak-sú River, the other westward into the lake.

Eastward from the watershed the Great Pámír Valley contracts. We followed down a rivulet which, shortly before reaching the camp at Shásh Tupa, joins a considerable stream coming down a broad valley from the south. The name of our camp was derived from the "Shásh Tupa" or "six hills" by which it is surrounded, and between each pair of which roads issue to different parts of the Pámír steppes.

Our road from Shásh Tupa lay for nearly 8 miles due north on the right bank of the stream, and then continued down it for 10 miles in a north-east direction to the camp "Dahn-i-Isligh." On our left we passed three broad open ravines, containing streams coming from the west; one of them was nearly as large as the river we were following, and before joining it passed through a plain some 6 miles long and two broad. At Dahn-i-Isligh the river is joined by two more streams, the Kizil Robat coming from the south-east, and the Kara-sú from the west, both of which pass through broad grassy valleys. The ground is very open, and may be traversed in almost every direction. Two or three miles north-east of our camp the Great Pámír terminates, having extended for a distance of some 90 miles from Boharak.

From Dahn-i-Isligh I took a path which follows the Isligh stream, until it emerges into the Ak-sú Plain; this road is somewhat circuitous, and the rest of the party took a shorter line, going over a low pass, and rejoined the main stream about 16 miles from our starting point. The path I followed is rarely used by travellers; in summer it is quite impassable on account of floods. When I went down it (in April) the ice was breaking up, and travelling was somewhat dangerous, as the river had to be crossed many times. The hills on the north are very precipitous, and in places rise nearly perpendicularly to a height of some 2000 feet above the river-bed. Where the two paths unite, the valley opens, and down it a good road leads to the Ak-sú Plain, which is crossed diagonally in a south-east direction. Prior to reaching our camp at Ak-Tásh, we had much difficulty in crossing the Ak-sú River, which was much swollen by melting snow. On this march (37 miles in length) I had the good fortune to shoot an *Ovis poli*, the only one that has fallen to the rifles of our party.

At Ak-Tásh we rejoined the road we had followed on our outward journey, and returned by it, to Tashkurghán and Yárkand making the slight variations in our route, to which I have already alluded.

It appears from the foregoing narrative that although the name Pámír has been inaccurately employed as a generic term covering the whole of the elevated mass lying between the Hindu Kush and the mountains of Khokand, yet it is rightly applied to some of the *steppes* which occupy a large portion of this region. These *steppes* would appear to be a series of broad undulating grassy valleys, formed on the surface of an elevated plain, by lofty ridges running more or less parallel to the equator. The general slope of the plateau is from east to west. Its eastern portion is gently undulating, and comparatively flat, while its western edge merges into spurs, separated by bold and precipitous defiles. On the east the Pámír *steppes* are bounded by a transverse ridge, which has been termed the Pámír Range. This ridge runs in a northerly direction and is the true water parting between eastern and western Turkistan; at the Neza Tash Pass where we crossed it at a height of 14,915 feet, the watershed is very clearly defined, and the ridge rises some 2000 feet above the valley of the Ak-sú River which flows at its base. This watershed was again crossed by the Russian Scientific Expedition under Kostenko in 1876, at the Uz Bel Pass—15,200 feet above sea-level—also about 2000 feet above the valley of the Uz Bel and the Chon-sú Rivers.

To the east of the Pámír Range there is an extensive plateau which stretches from the Muztágh Range of the Himalaya Mountains, up to—as far as I myself saw—lat.  $38^{\circ}20'$ , but said by Kirghiz to extend up to the neighbourhood of the Kizyl-Yart Pass. This plateau is in turn bounded on the east by the range which Hayward designated the Kizyl-Yart, the name by which it is known to the inhabitants of Kashghar.

Mayef's description of the Uz Bel-sú shows that the Pámír Plateau, where he visited it, has much the same characteristics as where we ourselves did. He says that the rivulet runs a course of about 20 miles without any deviation from its original direction. In its lower course it is much confined by mountains of no great height, farther on, however, the valley opens out to widths of 2 or 3 versts, with a flat smooth surface gradually ascending eastwards. The mountain chains to right and left rise to 2000 and 3000 feet above the valley, those, however, skirting the valley on the left or south side are somewhat more elevated, attaining to 15,000 and 16,000 feet, and so rising above the snow-line. The declivities are bare and sterile, as is also the surface of the Uz Bel-sú Valley.

It is instructive to turn from this to Fedchenko's description of the Alai Valley,\* which he describes as a "tract limited by

\* Manuscript translation by Colonel Yule, C.B.



parallel mountain ranges, which rise gradually from 8000 to 12,000 feet in height, and widens gradually as it rises. Towards its lower end it is separated from the crests of the limiting ranges by outlying mountains, but towards its upper end it spreads towards these crests without any passable break in the surface. At the western termination of the steppe it becomes gradually narrower, hemmed in by other ranges which rise parallel to the principal chain and ends in a defile which affords room for the exit of the river and no more."

After a perusal of the description of the Alai by M. Fedchenko and of the northern portion of the Pámír Plateau visited by Kostenko, no doubt is left on my mind, but that the whole of the so called Pámír Plateau, including in this term the whole country between the Little Pámír on the south, and the Alai Plateau on the north—and bounded on the east by the Pámír ridge, may be regarded as having a common physical configuration, resembling in many important respects the system of the Tian Shán. This is in part what Fedchenko always contended for, but he went much farther and maintained that the whole mass of the mountain system which separates the Oxus and Tarim basins, was similarly divided into parallel mountain ranges running from east and west. He could not be brought to agree with Hayward, who was the first to resuscitate Humboldt's idea of a great meridional chain connecting the systems of the Himalaya and the Tian Shán.

Fedchenko argued that the line of snowy mountains seen by Hayward from the plains of Kashghar, really were the culminating ends of a series of parallel mountain ranges running east and west.

There can, however, I think, from what I have already stated, be no possible doubt that such a meridional chain does exist. I was myself enabled from various points on the road from Yarkand to Kashghar to fix with considerable accuracy the position of several peaks of this Kizyl-Yart Range; the four most conspicuous ones, embracing a length of 52 miles, I found to lie almost exactly in one straight line, having a direction of about 30° west of the true meridian. The most southerly and the highest of these, the Tagharma Peak of Hayward, I ascertained trigonometrically to be 25,350 feet above sea-level, while two others are at least 22,500 feet high.

Now this same Tagharma Peak has also been seen by M. Fedchenko from the Is'fairam Pass, and he rightly estimated its height at about 25,000 feet, which is three or four thousand feet in excess of the estimate made by Hayward. From Fedchenko's point of view the peak to which he gave the name of Mount Kauffmann, appeared to be a continuation of the

Trans-Alai Range, but the recent visit of Major Kostenko has put this question beyond all doubt. He saw these mountains from the west from the Uz Bel Pass 15,200 feet above sea-level. From this point, looking east over the valley formed by one of the sources of the Kashghar River, he says, "the valley a long way ahead seems bound by a grand mountain range rising considerably above the snow-limits and whose peaks appear to rise to a height of about 25,000 or 26,000 feet.

It will be recollected that on our journey to the Little Pámír, while travelling in a direction nearly at right angles to this chain, we crossed several spurs at heights varying from 13,000 to 15,000 feet, and separated by deep valleys, lying 3000 or 4000 feet below the crests of the passes. The streams down these valleys all flowed in a south-easterly direction towards the Yárkand River, in which direction the Kizyl-Yart Range diminishes very much in height. The Tashkurghán River pierces these same mountains, passing through a deep and precipitous gorge at a height of about 10,000 feet above sea-level. Little is known of the range farther south, but it would seem to be a connecting link with the Himalayan Ranges, so that the old Chinese geographers who did indeed link together the "Bolor" and the "Mustagh or Kárákorum" under the common name of "Tsung Ling," or "onion mountains," were not far wrong in their ideas.

To show the extent to which theorists may carry their views, and the inconvenient consequences that may sometimes arise therefrom, I may mention that one day at Yangi-Hissar we received a budget of three weeks' English letters and newspapers. On opening the last file of the 'Times' I was astonished to find a letter from the Berlin Correspondent of that journal stating that he had recently studied the latest Russian map by Fedchenko, from which it appeared that the range which I have been describing did not exist. From this he proceeded to argue that a railway might, without the slightest difficulty, be constructed from the Oxus basin to that of the Tarim, in the approximate latitude 39°. I glanced up from my paper as I read, and in the exact spot indicated I saw these vast inaccessible, apparently unbroken mountain-masses covered with perpetual snow, and rising to a height of more than 20,000 feet. I should recommend intending subscribers to the proposed railway to wait for further detailed surveys before they commence operations; but, up to the present time, these vast mountain masses have still proved inaccessible to all attempts at exploration.

It has been the fashion in England to assume that the Russians have for a long time been better acquainted with this



portion of Central Asia than we are; but this is a great mistake. Up till very recently they were as ignorant of the country as we ourselves; their maps showed the same extent of blank and *terra incognita*, and although we have hitherto been generally dependent on them for maps of the countries within and in the vicinity of their frontier-line, they have been equally dependent on us for all maps of countries in the neighbourhood of our own frontier, as well as of the head-waters of the Panjah branch of the Oxus. During the last few years, however, the Russian explorers have made such rapid strides, that the belt of *terra incognita* between their advanced surveys and our own has, I am happy to say, in the interests of geographical science, been very considerably reduced. I have already indicated the advanced lines followed by our British explorers, and I will now briefly indicate the most recent approaches of Russian geographers. In 1872 a Russian mission under Baron von Kaulbars came to Kashghar *via* the Lake Chatyr Kul, and when in the following year I myself made a route-survey from Kashghar to Chatyr Kul, I forged the first link in the chain of surveys common to both countries. I must, however, in all fairness, assign to the late Mr. Hayward the honour of having been the first on either side to take astronomical observations at Kashghar. It was a great source of gratification to me when I returned to India and worked out the final results of my astronomical work at Kashghar to find that my resulting position, both in latitude and longitude, practically coincided with that obtained by Colonel Scharnhorst, the astronomer of the Russian Expedition, while our joint positions of Lake Chatyr Kul accorded equally well. The heartbreaking discrepancies which had hitherto existed in the assumed position of Kashghar were thus finally put an end to, for which I confess I think geographers and map-makers ought to be thankful.\*

An almost equal source of gratification on my return to India—after all my computations were completed, and the details of routes transferred for the first time on to a correct graticule—was to find that my position of the west end of Victoria Lake (which was the extreme east point reached by the late Lieutenant Wood in his journey to the source of the Oxus in 1839), is practically identical with the independent determination of the same point by that distinguished traveller.

The second link in the chain of surveys common to the Russians and ourselves is the line from Kuláb to Kurghán Tapa and Kubádian, which was traversed and roughly sur-

\* For further details see Appendix at the end of this paper, which is extracted from my Report, originally submitted to the Government of India in 1875.

vayed in 1874 by the *Havildar*, one of the Indian Survey employés. He was the first to identify the *Vaksh* with the *Surkháb*, or river of *Kárátegin*, and to determine approximately the whereabouts of its junction with the *Oxus*. A Russian scientific expedition under Major Mayef surveyed the same route, with more care and precision in the following year, and, curiously enough, although its members were most anxious to fix rigorously the junction of the *Vaksh* with the *Oxus*, circumstances prevented them from accomplishing their desire. They, however, made most valuable explorations and surveys to the north-west of the line *Kuláb-Kubáidian*, filling up what was previously a large blank on both English and Russian maps, while the *Havildar*, on the other hand, has given us new and valuable information about the course of the *Oxus* to the east of *Kuláb*, and of the country of *Darwáz* through which it flows. Shortly before our visit to Kashghar the Russian traveller and savant, *Fedchenko*, did some very valuable pioneering work in *Khokand* and the *Alai*, and he was the first to visit the head-waters of the *Kizyl-su*. He was a most keen, enthusiastic and accomplished geographer, whose untimely and sudden end in Switzerland a few years ago was a very heavy loss to geographers. It is only a few days since I was reading some remarks by him on his mortification at being prevented from penetrating to the south of the *Alai*. Alluding to the 160 miles that then separated his own discoveries in the *Alai* from the English explorations from the south, he says, "This is as yet the *real neutral zone* (the name is suggested by the fictitious neutral zone lately concocted by diplomacy), on which neither Russian nor English foot has yet trodden, though the high scientific interest which attaches to the region makes its exploration the ambition of both nations—eminently so of the English, whose geographical emissary, *Hayward*, paid with his life his persevering efforts to penetrate the mysterious *Pámír*"—he continues, "My heart's desire, also my ardent hope, the vision ever before my eyes since I first set out for *Turkistan* in 1868—was to reach *Pámír*; but the hoped-for result was not attained."

I have already alluded to the work done in the *Pámír* district on the occasion of General *Skobeleff's* advance with a military force into the *Alai* in 1876, an account of which has been given to the Society by Mr. *Michell*.\* The exploring party under Captain *Kostenko* reached and surveyed the Lake *Kará Kul*, and advanced as far as the *Uz Bel Pass*. Another Russian exploration party, consisting of Messrs. *Severtzof*, *Skami*, and *Schwarz*,

\* See 'Journal' R.G.S., vol. xlvii., 1877, page 17.



visited the same district in September 1877; but, as far as I can learn, they did not succeed in penetrating farther south than Kostenko had done, but were prevented by deep snow and the running short of fuel and provisions from continuing their advance.

Another Russian officer, Captain Kurapatkin, in the autumn of 1876, travelled from Osh to Kashghar by the Terek Pass, and thence onwards by Marálbashi to Aksú, thence on to Kurla and Káráshahr. No account of his journey has, as far as I know, yet reached this country.

I cannot close this paper without an allusion to the recent wonderful success of Colonel Prjevalski farther east, a success which, I may say in the words of Fedchenko, "it was once my own heart's desire and ardent hope to attain." Starting from Kuldja, he reached early last year the celebrated and almost mythical Lake Lob, in the centre of the hitherto unexplored desert of Gobi. This lake is the sole final receptacle of the drainage of the mountain masses which inclose Eastern Turkistan on north, west, and south. He went 120 miles farther south, to the northern edge of the great Tibetan Plateau, where he saw and hunted the wild camel. This enterprising traveller is now engaged in an attempt to visit Lhása *viâ* Guchen and Hami.

There still remains, as we have shown, a broad belt of *terra incognita* on the Pámír Plateau. It will, we hope, ere long have its geography cleared up, although the laurels must necessarily fall to the Russian geographers; for their occupation of the country of Khokand, which has for a long time exercised some control over the nomadic Kirghiz tribes of the Alai, gives them opportunities and motives for farther exploration which we do not possess, and now that our recent ally, the late Amír of Kashghar, is dead, and his kingdom once more in possession of its former masters, the Chinese, who never in former years exercised more than nominal sovereignty over these interesting regions, I fear there will be little opportunity for farther explorations from the British side. In scientific questions there ought to be no politics, and I for one shall be glad to learn that the Russians have extended their surveys as far south as the line by which our party crossed the Pámírs in 1874.

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## APPENDIX.

*On the construction of the Map.\**

The positions of all places in Eastern Turkistan and Wakhán, that were visited by members of the Mission, depend upon the astronomically fixed positions of the Yangi-Shahr, or new city of Kashghar.

The final positions in longitude of Yárkand and other important places have been determined as follows:—

The true longitude of KASHGHAR (Yangi-Shahr is) .. .. .	..	..	76° 6' 47"
The difference of longitude between Kashghar and Yangi-Hissar as determined by Pundit Kishen Sing's pacing, corrected from latitude observations, is—			
On outward journey .. .. .	+ 0° 6' 15"	} mean 6' 8"	+ 6' 8"
On return journey .. .. .	+ 0° 6' 0"		
Giving for longitude of Yangi-Hissar .. .. .	..	..	76° 12' 55"
The difference of longitude between Yangi-Hissar and Yárkand, determined in the same manner—			
By outward journey is .. .. .	1° 3' 0"		
By return journey .. .. .	1° 4' 25"		
On the outward journey the survey was carried along the direct road, about 75 miles in length, and over a perfectly level country, whereas on the return journey the road followed a circuitous line of 180 miles, over one snowy pass and very rough ground. The first value is therefore accepted in preference, viz. .. .. .	..	..	1° 3' 0"
Giving a final value for YÁRKAND (Yangi-Shahr) of .. .. .	..	..	77° 15' 55"

which is 0° 3' 5" in defect of the astronomically determined value of the same place. I have determined to accept the value as deduced from Kashghar in preference to the independent results arrived at from observations to the moon.

Again, the final longitude of Yangi-Hissar (as above) .. .. .	..	..	76° 12' 55"
The difference between Yangi-Hissar and Tashkurghan by Pundit's pacing corrected for latitude is .. .. .	53' 25"	} mean 53' 54"	..
The difference ascertained chronometrically by Captain Trotter is .. .. .	54' 23"		
Giving a final value for TASHKURGHAN of .. .. .	..	..	75° 19' 1"

\* This Memorandum is extracted entire from the Report submitted by me to the Government of India in 1875.—H. T.



which is  $4^{\circ} 59''$  in defect of the value obtained from one night's observations to the moon at the same place.

The longitude of Kila Panjah (Wakhán) was determined chronometrically:—

1. On outward journey, from Tashkurhán .. .. .  $72^{\circ} 44' 18''$
2. On return journey, from Ighiz-yar (near to and connected with Yangi-Hissar by a traverse survey) .. .. .  $72^{\circ} 46' 40''$
- Giving a final longitude for KILA PANJAH of .. .. .  $72^{\circ} 45' 29''$
- Whilst the observations for absolute longitude at the same place give a result of .. .. .  $72^{\circ} 45' 30''$
- And a fourth entirely independent result obtained by Captain Trotter's route survey, corrected for latitude is .. .. .  $72^{\circ} 44' 10''$

The mean result obtained chronometrically is adopted for the final position. The wonderfully accordant results at Kila Panjah, although highly satisfactory, must perhaps, to a certain extent, be regarded as fortuitous; but the admirable rates obtained for the watch employed in the chronometric determinations, a silver lever watch, by Brock of London, specially made for explorations, are worth recording,\* and ought to give results in the accuracy of which great confidence may be placed.

\* TRAVELLING RATES obtained by CAPTAIN TROTTER for BROCK'S LEVER WATCH No. 1602, during JOURNEY from YANGI-HISSAR to KILA PANJAH, and RETURN JOURNEY to YARKAND.

STAGE.	DATES.	Number of Days from which Rate was determined.	Rate per Diem gaining in Seconds of Time.	REMARKS.
Yangi-Hissar to Aktala.	18th to 22nd March.	4	+ 6.0	(1) Rate obtained by comparing difference of observed times with difference of longitude as derived from Pundit's pacing, corrected for latitude.
Ak-tala to Tashkurhán.	22nd to 31st March.	9	+ 6.1	(2) Ditto ditto.
Yangi-Hissar to Wakhán and back to Ighiz-yar.	18th March to 18th May.	61	+ 6.1	During these 61 days almost an entire circuit was made. The difference of longitude between Yangi-Hissar and Ighiz-yar, viz., $1^{\circ} 45'$ only, was determined by Pundit's pacing.
Kogachak to Ak Tash.	3rd April to 5th May.	32	+ 5.7	During these 31 days a smaller circuit was made; the difference of longitude between Kogachak and Ak Tash is $1^{\circ} 35'$ . In both these circuits allowance has been made for the stationary rate (+ $2'' \cdot 8$ ) obtained during our halt in Wakhán.
Kashghar to Ighiz-yar.	15th to 18th May.	3	+ 5.5	Rate obtained in same manner as (1) and (2).

It should be noted that my watches and chronometers were always carried in a small box that I had specially made for them, carefully packed in cotton wool, and inserted in the middle of a large leather mule trunk, packed with clothes. They were thus kept at a tolerably uniform temperature and escaped in great measure the jerks and shakes they would otherwise have been exposed to. Of my pocket chronometers, having a regular chronometric escapement, one by Peter Birchall, London, No. 1096, was well suited for astronomical observations, keeping excellent time when stationary and beating half seconds very audibly. It was

I am much gratified to be able to state that after all my computations were completed, and the details of routes transferred for the first time on to a correct graticule, my position of the west end of Victoria Lake (the extreme east point visited by Wood in his travels) was latitude  $37^{\circ} 27'$  north, and longitude  $73^{\circ} 40' 38''$ , which is practically identical with the independent determination of the same point by Lieutenant Wood, which is given at page 232, new edition of Wood's 'Oxus,' with essay by Colonel Yule; London, 1872.

I will now indicate how the positions of points on the road between Leh (Ladakh) and Yarkand have been determined. The position of Ak-tagh (2nd camp) was fixed by myself in lat.  $36^{\circ} 0' 11''$  and long.  $78^{\circ} 6' 20''$ . It was the converging point of three different route surveys (by Pundits) starting from fixed points on the south, and is in the neighbourhood of a hill above Chibra, whose position was satisfactorily fixed by intersection (on the plane-table) of several rays from trigonometrically fixed peaks of the Kárákorum. The position of Ak-tagh in longitude with regard to these peaks may be looked on as correct within a mile, and its position in latitude is undoubtedly correct within a few hundred feet.

From this point three traverse lines have been carried by different surveyors to Karghálík, which, when corrected and adjusted on the proper parallel ( $37^{\circ} 53' 15''$ ), had a maximum divergence of  $3\frac{1}{2}$  miles, the mean of the three values gives a position in (true)  $\dagger$  longitude of  $77^{\circ} 25' 30''$ .

Between Karghálík and Yarkand I had also two independent traverses, i.e., on both outward and return journey, which differed from each other in the resulting longitude of Karghálík by less than a mile. The mean of these two when referred to the value of Yarkand as determined from Kashghar places Karghálík in longitude  $77^{\circ} 28' 30''$ . A mean between this and the value previously deduced from the south gives  $77^{\circ} 27' 0''$  which has been assigned as its final position. The smallness of the amount of the adjustment necessary to connect my own work, depending on my own astronomical observations at Kashghar, and that depending on the Indian Survey derived from the astronomically fixed position of Madras, is a gratifying proof of the general accuracy of the work.

This sketch would be incomplete without a few lines as to my connection on the north with the Russian Survey, which appears, I think, equally satisfactory with the above.

The only position in the Amír of Kashghar's dominions in Eastern Turkistan astronomically fixed by the Russians is that of Kashghar. This was done in 1872, the year prior to our own visit, by Colonel Scharnhorst of the

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always used by me in my astronomical observations, but it required very careful handling, as a violent jerk was apt to make it gain several seconds suddenly. A third watch, a pocket chronometer, by Dent, unfortunately got out of order before the Pámir trip, but I had found that, while travelling, neither its rate nor that of Birchall compared favourably with that obtained from Brock's watch. It is perhaps needless to add that my watches were daily carefully compared together, and also both before and after observations of stars. An omission to do this on a single occasion prevented my getting a chronometric value for the differences of longitude between Yangi-Hissar and Kashghar.

\* The position in longitude in the "Preliminary map" differs slightly from this, as the latter had to be prepared prior to the completion of the computations.

$\dagger$  True, i.e., depending on the most recent determination of the longitude of Madras. All the Indian Survey maps are based on the astronomically determined position of the Madras Observatory. Recent observations have shown that the old value, that is the one adopted by the Survey Department, is about 3 miles too much to the east. In my map I have been compelled to make allowance for this, and have shifted 3 miles to the west the whole of the positions in Northern India taken from the existing maps.



Mission under General Baron Von Kaulbars. A comparison of results is given :—

Position of Yangi-Shahr (Kashghar) determined by English Mission, 1873 :—

Latitude .. .. .	39° 24' 26" North.
Longitude .. .. .	76° 6' 47" East of Greenwich.

Position of Yangi-Shahr (Kashghar) determined by Russian Mission, 1872 :—

Latitude .. .. .	39° 24' 16" North.
Longitude .. .. .	76° 4' 42" East of Greenwich.

As the quarters occupied by the British Mission, where the observations were made, lies outside and to the east of the fort, while those occupied by the Russians were in about the same latitude and nearly 1 mile to the west of the fort, the difference in longitude is reduced to about 1 mile, our latitudes being practically identical. I would have wished to take the mean between the two as the final position of Kashghar, but as our stay there was of much longer duration than that of the Russians, and I had opportunities of taking many more observations than they did, I prefer leaving my own values intact.\* The slight discrepancy now noticed disappears on the road between Kashghar and Chatyr Kul, the only line of survey common both to the Russians and ourselves, and along which I carried a rough traverse survey in which the distances were estimated by the time occupied on the line of march. Prior to my departure from India, Colonel Stubendorff, of the Russian War Office, had sent to Colonel Walker, the Superintendent of the Great Trigonometrical Survey, the positions of a number of points in Russian and in Khokandian territory that had been astronomically determined by Russian officers. Amongst them was the north-east corner of Lake Chatyr Kul. Bearing this in mind, when at the most northerly point on the road reached by us, I took a bearing tangential to the east end of the lake, which lay nearly due north at a distance of about 3 miles from us. On my return to India, when I plotted in my work from my own astronomical position of Kashghar, I found that by adopting the Russian value in latitude of the east end of the lake, viz., latitude 40° 43' north, our positions in longitude† of the same point exactly coincided.

In determining the position of Khotan I have made use of Pundit Kishen Sing's route from Karghālik to Khotan, and thence *via* Kiria back to Ladākh. As a result of this route survey, our previously accepted value of the longitude of Khotan has been altered by more than 30 miles. It may appear bold to make this extensive change in the position of a place that has been visited by a European explorer (Mr. Johnson), but the route survey executed by this Pundit is so consistent, and the plotted results agree so closely with the observed latitudes throughout the whole of his work, that I have no hesitation in accepting it as correct. I may further add that I have been in communication with Mr. Johnson on the subject, and that he freely admits the possibility of a large error in his longitude of Khotan.

\* Since the above was written Colonel Walker has heard from Colonel Stubendorff that the Russian astronomical observations at Kashghar which were taken by Colonel Scharnhorst were referred to the most northern angle of the Yangi-Shahr, a position almost identical in latitude with my own, and differing by two-fifths of a mile only in longitude. Colonel Stubendorff mentions that the Russian observations depend on the eclipse of the sun on the 6th June, 1872, and that corrections for error in the lunar tables have not been applied. This last remark applies to my own observations also.—H. T.

† 75° 24' East of Greenwich.

He states that in commencing his reconnaissance from the Kuen Luen Mountains (which he carried on with the plane-table only), one of the three trigonometrically fixed points on which his work was based, turned out subsequently to have been incorrectly projected on his board. This, together with the doubt that must always exist when rapidly passing through an unknown country as to the identity of the different peaks visible from the line of march, is quite sufficient to account for the discrepancy. In my preliminary map I have assigned to Khotan a longitude of  $79^{\circ} 59'$  instead of  $79^{\circ} 26'$ , the position it has recently occupied on our maps. About its latitude there can be no doubt. Mr. Johnson took several observations there with a 14-inch theodolite and obtained a mean result of  $37^{\circ} 7' 35''$ , whilst from Kishen Sing's observations with a sextant, extending over nearly a month, we have a mean result of  $37^{\circ} 7' 36''$ . The points east of Khotan, i.e. Kiria and the Sorghak gold-fields, are derived from Kishen Sing's route survey, combined with his latitude observations. We also have from the same source a complete survey for the first time of the road *via* Polu to Noh, and thence to Leh. As a specimen of the accuracy of this Pundit's work, I may mention that when the road from Karghálík to Pal, a distance of 630 miles, was plotted out on the scale of 2000 paces to the mile, without any correction or adjustment whatever (although  $4\frac{1}{2}^{\circ}$  were added to each magnetic bearing in order to allow for magnetic variation) starting from my own value of Karghálík, the plot closed at Pal (fixed by the Great Trigonometrical Survey) almost absolutely correct in latitude and only eight minutes out in longitude, and in no single portion of the whole route, which passes over elevations exceeding 17,000 feet in height, did the plotted value differ by as much as 3 miles from his own observed astronomical latitude.\* Of this discrepancy of eight minutes in longitude it is possible that a portion may be due to error of position in the starting-point (Karghálík), but it may be noted that the amount is no more than would be accounted for by an error of  $1\frac{1}{2}^{\circ}$  in the assumed value of magnetic variation. It is not to be supposed that such accuracy is generally attainable, but in the present case, although the surveyor laboured under certain disadvantages from the absence of inhabitants, yet there were the compensating advantages that he was under no necessity for concealment; he was therefore able to take and record bearings when and where he pleased.

As regards the work executed to the north-east and east of Kashghar; the position of Marálbashi, on the road to Ak-sú, was fixed in latitude by Captain Biddulph, and its position in longitude is roughly determined by a few bearings, and estimated distances taken by him on the road from Kashghar.

On the road to Ush Túrfán I carried on a rough route survey wherever I went, and took observations for latitude and obtained chronometric determinations of longitude as far as Úi Bulák, in latitude  $40^{\circ} 26'$  north, and longitude  $77^{\circ} 36'$  east. Thence by route survey I got a determination of the position of the Belowti Pass; calculating from this the probable position of Ush Túrfán, I place it about three-quarters of a degree to the east of the position given it in the early edition of Colonel Walker's Turkistan map. On examining the latest Russian map, it appears that the position of Ush Túrfán has been recently altered, and placed very near where I would myself locate it. I have therefore in my map adopted the last Russian values of Ush Túrfán, Ak-sú, and all places to the east. It will be found that the cities of Ak-sú and Kuldja are more than 40 miles to the east of the places assigned them in all but the most recent maps.

The details inserted to the north of the map are taken almost exclusively from the Russian topographical map of Central Asia (corrected to 1877).

Most of the details to the south of the map, with the exception of those

\* See Geographical Appendix, Section A, of Captain Trotter's Report.



portions north of Leh that have been traversed by members of the Mission, have been taken from the last edition of Colonel Walker's Map of Turkistan, but all the positions in the latter have been shifted three minutes to the west in longitude in order to allow for the most recently determined value of the longitude of Madras, viz.  $80^{\circ} 14' 19.5''$  east of Greenwich.

In the portion of country traversed by Members and Attachés of the Mission, use has been made of all the material collected by them. The maps of Messrs. Shaw and Hayward have also been called into requisition.

The reductions of the astronomical observations, and the computations of heights, have all been made in the Office of Colonel Walker, R.E., the Superintendent of the Great Trigonometrical Survey, in whose office also the map compiled by myself has been drawn and photozincographed. A large amount of work has been got through in a moderate space of time, and I am deeply indebted to Colonel Walker for the facilities he has given, and to Messrs. Hennessey, Keelan, and Wood, in the Computing Office, and Messrs. Atkinson and Sindon in the Drawing Office, for the assistance afforded by them in their several departments.

H. TROTTER, Capt. R.E.

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## VI.—*Haiti, or Hispaniola*. By Major R. STUART, *H.M. Minister, Haiti*.

LITTLE is commonly known of an island which, from its size, natural wealth, and position, was, not far back in modern times, the theme of widespread speculation, which was marked out to be the metropolis of a prospective empire, but is now in a state of poverty and decay, in painful contrast with the grandeur of its early destinies.

The island I allude to is known by the names of *Haiti* and *Hispaniola*, and also, but with insufficient warrant, by that of *Santo Domingo*. The object of this paper is to give some account of it, and recall attention to its forgotten importance, seeing that one day the force of progress and the march of events must restore to it a prominent place in commerce and in political consideration.

When speaking of the island as a whole, I shall call it by the name of *Haiti*.

Looking in any good atlas to the map of the West Indies and Central America, one will find this island lying between the 18th and 20th parallels of N. latitude, and between  $68^{\circ} 20'$  and  $74^{\circ} 26'$  W. longitude from the meridian of Greenwich. Its extreme length from Cape Engano on the east, to Cape Irois on the west, is 356 nautical miles;\* its greatest breadth is 140 miles, from Cape Beata, in latitude  $17^{\circ} 53'$  in the south, to the highest point on the north coast, which is  $19^{\circ} 58'$ . The coast

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\* Throughout this Paper the miles given are nautical miles.

line, measuring indentations, may be taken roughly at 1100 miles, and the superficies, with a nearer approach to accuracy, at 26,000 square miles, or, to bring it home at once to the reader's mind, about the same as that of Ireland.

The axis of the island lies nearly due east and west; the south line of coast ranges north of the 18th parallel of latitude, which cuts through the promontory of Beata. The 20th parallel almost shaves the north coast.

In outline *Haiti* bears a resemblance to a turtle, the eastern promontory forming the head, the two western promontories answering to the animal's hinder extremities. A view of the island in profile is also suggestive of the same likeness, presenting, as it does, a swelling mass emerging from the deep and attaining its greatest height in the middle.

The island is essentially of a mountainous character; and there are three distinct formations: the central, the northern, and the southern, which have no common nucleus or connecting bands. The northern and the southern are well-defined single chains; the central, from its extent and more complex tracing, deserves the name of *system*. It is complete in itself, and constitutes an integral feature in the physiognomy of the island.

Speaking figuratively, this system forms an oval crest on the turtle's back, conforming to the contour of the shell, equidistant from the sides, and approaching the tail in an irregular line. To a bird's-eye view it would resemble a racket with an elongated palm, the handle being the low ridge which, starting from the oval in lat.  $18^{\circ} 54'$ , long.  $70^{\circ} 8'$ , runs through the eastern promontory to its extremity, a distance of about 95 miles.

This ridge is in no part more than a thousand feet high; but at the point of junction with the oval it rises in a dome-shaped mountain of considerable elevation, out of which emerge, on the other side, two distinct chains, of which one holds a direct and nearly continuous course through the whole body of the island, terminating at Cape St. Nicolas, the north-western point. The other deflects to the south-west for about 40 miles as far as Mount Ocoa, when, taking a westerly direction, it stretches away in a slight curve until stopped by the sea on the west.

When at their greatest divergence these two chains are connected by a lofty ridge, which bends away south-west from the northern chain, about 125 miles from the eastern end of the oval, and, after an S-shaped course of some 70 miles, impinges on the southern chain, about 18 miles from its extremity.

The oval thus formed constitutes what may be called the



mountain-system proper of the island, the disconnected chains on the north and south being only subordinate outliers.

The northern side of the oval is the dominant chain, and is the backbone of the whole island. It is called *Cibao*, said to be from *Ciba*, the Indian word for *rock*. From end to end, that is, from Point Macao, its eastern extremity, to Mount St. Nicolas, its western, it may be stated at about 300 miles in length. It is divided into three segments: the eastern terminal part, which, as already stated, is about 95 miles long; the central, which extends from the parting of the chains to the deflection of the connecting ridge, about 125 miles; and the western terminal part, which is about 80 miles in length, making altogether 300 miles of rough measurement.

The topography of the region adjoining the eastern terminal segment of the chain belongs to the southern division of the island. The central segment therefore stands first in order for notice, as well from its relative position as from its richness in materials for description.

This part of the chain is in fact par excellence "The Cibao." Starting from the point of divergence, it is at first broken and so irregular as almost to lose its trend among the foot-hills of the southern bend; but at Mount Guana, about 23 miles to the west, it asserts itself again, the ridge becomes clearly defined, and, rising as it advances, attains towards the middle an average height of nearly 7000 feet. From distance to distance it throws up peaks from 1000 to 1500 feet higher still; such are Mount Entre los Rios, Mount Gallo, and Mount Jicome, all three within a space of about 15 miles, on the middle part of the segment.

The highest points, however, are not on the crest, but in the angle at the east end of the oval, which is filled with a confused mass of mountain heights, connected at the base but without any defined trend. Out of this mass emerge the two highest points of the island, namely, Loma (Mount) Tina, and the Pico del Yaqui, also called "El Rucillo," from the wreath of silvery clouds that always encircles its summit.

Between Sir R. Schomburgk and Mr. Gabb, the well-known American topographer, there is a difference of opinion as to the respective claims of these two mountains to the pre-eminence. And, strange to say, Schomburgk, in his excellent map of Haiti, committed the oversight of marking in figures on Yaqui the height which he designates in the marginal tracings for Tina. That height is 2955 metres = 9695 feet English.\* According

\* 1 metre = 39.371 inches English.

this altitude for the present to the Pico del Yaqui, I proceed to say that that mountain stands in lat.  $19^{\circ} 2' N.$ , long.  $70^{\circ} 54' W.$ , a little south of Cibao, and occupying, as nearly as may be, the central spot of the island. It rises from the midst of its own group of satellites; and from its flanks issue the head-waters of the northern and the southern Yaqui, two out of the four principal rivers in Haïti. The former forces a passage through the broken part of Cibao, and, reinforced on the other side by the Jimenoa, one of its main affluents, it holds its course nearly due north, to Santiago de los Caballeros, situated 24 miles north of the crest of Cibao, at the main watershed of the great northern valley. Here the river bends westward, and, after a tortuous course of about 60 miles, as the arrow flies, falls into the bay of Manzanillo.

Between this river and the mountain-chain and great valley of Cibao there are such close topographical relations that, as I proceed, it will be necessary to combine them in description.

The southern or lesser Yaqui, also called "The Neyba," springs in part from the Pico del Yaqui, in part from the higher slopes of Mount Entre los Rios, and, after collecting its affluents into one volume, it finds a passage through the southern ridge of the oval, and flows due south to the sea at the Bay of Neyba, a course of about 50 miles.

At a direct distance of 37 miles south-east of the Pico del Yaqui, the rival mountain, Loma Tina, lifts its head. It is the culmination of a cluster of heights which, intervening between it and the Pico del Yaqui, nearly fill up the angular inclosure. A deep valley separates it from Mount Ocoa in the southern ridge of the oval, and through this valley flows one of the head-streams of the Las Cuevas, a tributary of the southern Yaqui or Neyba.

Speaking of this mountain, Mr. Gabb makes the following observations:—"I cannot believe that Loma Tina is as high as Schomburgk's figures make it (9695 feet). So far as an eye-estimate will warrant me in the expression of an opinion, I do not think it so high as the peak of the Yaqui, although it is certainly a high mountain. It is a long slope ending in a point, from which the opposite side descends precipitously. It is surrounded by many other points approaching it in height, say over 6000 feet, so that it is not so prominent nor so imposing an object as the silver-capped 'Rucillo,' the father of the two Yaquis."

"The people of the country," observes the same author, "say that it is impossible to reach the summit of Loma Tina, the route lying through dense forests, every step impeded by vines and bushes, and on reaching its flanks it must be necessary, as



is the case in all other highlands of St. Domingo (or Haïti), for the traveller to cut his way through thickets of fern, often so close that he must crawl on hands and knees through a tunnel, as it were, scratched by thorns and blinded by the fern spores at every step."

I have thought it opportune to quote the authority of the learned writer on this point, in his own graphic words. And I would add that not only in mountain exploration are difficulties encountered in this country, but also to a greater or less degree in every department of local research. For, of the means of passage and communication constructed by the Spaniards and the French in former years, but few traces now remain, while a luxuriant nature has long since reasserted her reign, almost as of old. Hence a liberal margin must be allowed for shortcomings in the attempt to portray, under such circumstances, the physical aspect of the country.

The Cibao chain, with the heights and ridges connected with it, forms the main watershed and river-source of the island. El Rucillo is the father, as Mr. Gabb says, of the two rivers Yaqui. The river Yuna springs in part from the heights around Loma Tina, in part from the southern rim of the oval. Working its way through the broken heights from which Cibao proper emerges, it flows N.N.E. about 20 miles to La Vega Reale ("the royal plain"), where it is joined by its great confluent the Camu, that gathers the waters of the transverse watershed, and thence the united streams roll, in a full but meandering volume, about 28 miles to Samana Bay.

From Mount Guana, a detached height at the eastern end and in the line of Cibao proper, a low spur strikes out north for a distance of about 12 miles, then bends to the west for 7 miles, then again north about 20 miles, where it mingles with the spurs of Monte Christi, the northern chain of the island. This transverse ridge is an important feature in the structure of these regions; all the waters east of it belong to the Yuna, those west of it to the Yaqui, for it is the watershed—*divortia aquarum*—of the great valley that lies between Cibao and Monte Christi. This valley it cuts into two nearly equal parts, the one declining eastward to Samana Bay, the other westward to Manzanillo Bay. The planes of these valleys intersect, at Santiago, at about 650 feet above sea-level, in lat.  $19^{\circ} 28'$  N. long.  $70^{\circ} 41'$  W. Westward of this line of longitude the main chain throws out ridges and spurs too numerous to be named in detail, if, indeed, that were possible in our still imperfect knowledge of the country. The hollows between these counterforts are, in general, deep and precipitous, and are all watered with streams of varying volume, which, spring-

ing from the main crest, descend to swell the waters of the Yaqui. The head streamlets, in their downward course, unite by pairs and by trios; and, this process again and sometimes again repeated, a considerable tributary is formed at length for the main river.

The chief of these tributaries, beginning from the east, are: the Bao, Amina, Mao, Gurabo, Cana, Caoba, Magnaca, and the Macabu, which joins the Yaqui at the apex of its delta.

These affluents vary somewhat in volume; in length, however, but little, because the course of the Yaqui runs nearly parallel with the crest of Mount Cibao; and the horizontal distance between the crest and the river is about 25 miles. But the streams acquire a much greater length from the sinuosity of the deep channels through which they flow. The inclosing ridges necessarily exhibit the same sinuosity: they are high and precipitous, and many of them so sharp at the crest as to have suggested the name "Cuchillo" ("knife"), given to them by the Spaniards.

Along this central part of the chain a continuous pine-forest clothes the ridge on the north side from the base to a height of some 4000 feet. Above this there is a broad belt of forest trees, and thence to the summit a dense growth of fern prevails.

The northern foot-hills consist for the most part of high rolling lands of a red gravelly soil, cut up by deep ravines and water-courses. Like the lower levels of the chain, these lands are covered with pine-forests, in the shade of which they yield also a growth of rank, coarse grass, which is utilised by the inhabitants for live stock of different sorts. Rain is scarce in these regions, and the soil is barren; settlers consequently are few, and cultivation scanty in proportion. Nevertheless, good tobacco in considerable quantities is raised on some of the lower table-lands and in the valleys wherever a breadth of alluvial deposit is formed. Indeed the ridge between the Gurabo and the Cana is so congenial to this plant as to have obtained the name of "Sierra Tabaco."

The Yaqui is almost wholly fed by the tributaries supplied by the central part of the Cibao chain. From Santiago to San Lorenzo, a distance of about 45 miles, the river flows through a valley flanked on the south by a low range of heights that border the foot-hills of Cibao, on the north by the precipitous slopes of Monte Christi. This valley gradually widens as it stretches from east to west; and at the river Caoba, where it is freed from the southern confine, it expands into a wide alluvial plain, which reaches to the river Dajabon (Massacre), a distance of about 15 miles.



Beyond the band which forms the western end of the oval, the main chain, after a break, is prolonged in two ridges, of which the northern, called "*Plaisance*," terminates at Port-de-Paix, lat.  $19^{\circ} 56'$  N. long.  $72^{\circ} 50'$  W.; the other, as already mentioned, at Cape St. Nicolas. Between these two ridges flows "*Les Trois Rivières*," a small river, so called from its three fountain-heads.

The great northern valley, already alluded to in part, calls for a more detailed description. It lies between the central part of Cibao and the parallel chain to the north, which Mr. Gabb has aptly christened "*Monte Christi*," the name given by Columbus to the peak forming its western extremity. The valley stretches from Samana Bay to Manzanillo Bay, is about 125 miles long, and 12 in average breadth. When first seen by Columbus on clearing the pass called "*Puerto de los Hidalgos*," the great explorer, in his admiration, called it "*La Vega Reale*"—the royal plain—which name, commonly shortened to "*La Vega*," is now confined to the eastern half of the valley; the western half being called "*the valley of Santiago*," while the aggregate name for the whole is the valley of Cibao.

The valley of Santiago has already been in part described, together with the river Yaqui, which flows through it.

The Vega is watered by the Yuna, which, in volume and length of course, is about equal to the Yaqui. The sources of the Yuna and of its main confluent, the Camu, have already been noticed. It remains to add that below the point of junction the river is further enriched by tributaries from the north and south, but chiefly from the south. It enters Samana Bay by several channels, and one channel more strikes due north and isolates the promontory of Samana. This channel is called "*Gran Resterio*"—"Great Creek"—a name that would lead to the conclusion that in the time of the Spaniards there was here an inlet of the sea that penetrated nearly to the bay. And in fact Charlevoix, who wrote in the early part of last century, says that the peninsula was then joined to the mainland by a marshy isthmus a quarter of a league broad, whereas the same isthmus is now more than two leagues across.

The Yuna and the Yaqui have some points of resemblance: they are of nearly equal length and volume, and they are both very tortuous from source to mouth. But while the only craft on the Yaqui are ferry-canoes, vessels of light draught can and do navigate the Yuna as far up as its confluence with the Camu; and thence, as far as Concepcion de la Vega, loaded canoes are continually plying up and down. The difficulty with the Yaqui is owing to the shallows which obstruct the mouth of the river, and even reach some distance up the channel. By reason of

these shallows and mud-flats, the Yaqui, I may add, shifts its lower channel; for, when discovered by Columbus, its embouchure was close to Monte Christi, about 6 miles north of the present mouth. The bed of the forsaken channel can still be easily traced.

The Yuna suffers, but in a much less degree, from the like impediments. In both rivers they could easily be removed, and the channels kept clear, by the employment of ordinary dredging machines.

About 5 miles north of Concepcion de la Vega, an eminence called "*Santo Cerro*"—"Holy Hill"—forms a conspicuous feature in the panorama: it is nearly 800 feet high, and is crowned by a church. From its summit one beholds La Vega in its whole length, from its broadest expansion beneath his feet, as it narrows away towards the sea, and the view is lost in distance.

The story goes that this eminence owes its name to an apparition of the Blessed Virgin at a critical moment of battle between Columbus and the Indians. Acting the part of the Dioscuri with the Roman armies, the heavenly vision, having alighted on the arm of a cross hard by, defeated the heathen enemy by turning their arrows back on themselves. A church was built on the spot in pious remembrance of this miraculous intercession; and within the church the hole is shown in which stood the foot of the cross, the same hole having by this time become a good-sized pit, because the earth in it, being holy, is sold to pilgrims at a shilling per measure of an ounce or so.

Between the Vega and the valley of Santiago there exists a noteworthy difference in respect to climate, and consequently of vegetation. For the north-east trade-winds, which are almost perennial in this part of the Atlantic, not only strike the headlands close outside the Vega, but draw through the Bay of Samana as through a funnel; and, compressed as it were between two walls of mountain, they discharge their load of moisture as they advance, diffusing coolness, verdure, and fertility on both sides. On arriving at the ridge which parts the two valleys, these winds are well-nigh relieved of their burden. As they press onward they become harsher and drier; the aspect of the country and the character of the vegetation change under their influence, until at length we come to a region of unkindly aridity, and of droughts that sometimes last a twelvemonth through.

The chain of Monte Christi, which forms the northern boundary of the valley of Cibao, is about 150 miles long, from Cape Samana, on the east, to Sella de Caballo, the terminal peak, on the west. In breadth it varies from 10 to 30 miles; and while



its southern flank is scarped and precipitous, on the north it slopes with an easy incline that reaches in places to the shore.

Only in a topographical sense can the ridge of Samana be said to belong to the Monte Christi chain. Though apparently a disconnected segment of the mainland formation, it differs from it, as will further on be shown, and from all the northern part of the island, in geological structure and composition.

As circumstances of recent date have lent a certain interest to Samana and the adjoining bay of the same name, it may not be out of place here to bestow on both a brief descriptive notice.

The island, or peninsula, as it is generally called, is about 30 miles in length, 10 in greatest breadth, diminishing to 6 miles at the west. It may be described as a mountain-ridge projecting into the sea, abounding in fertile slopes and terraces, and well watered on both flanks with rivulets that never fail. The crest of the ridge rather hugs the southern shore; it is in no part of any great height, and it terminates at the east in two conspicuous points, Pilon de Azucar, or the "Sugar-loaf," the more northern, 1936 feet high, and Monte Diablo, which I need not translate, about 1300 feet. Both these eminences are a little inland, and are well-known landmarks to the navigator.

Beyond these peaks the land terminates in a triangular expansion, of which Cape Cabron is the northern point, Cape Samana the middle, and Cape Balandra the southern. Cape Samana lies 5 miles south-east of Cape Cabron. The intervening shore curves inland, forming the shallow bay of Rincon, behind which lies a tract of fertile land stretching up 3 miles or so to the mountains. From Cape Samana, which is very prominent, a wall of red cliff strikes nearly due south about 3 miles to Point Vacca, where it trends to south-west for nearly 8 miles to Cape Balandra, a bold, rocky headland, formed by a spur of Mount Diablo. This part of the coast is peculiarly wild and repulsive: a rough, sea-worn face of limestone, against which the waves of the Atlantic beat with unceasing violence.

The soil on the heights is in places scant; but in the numerous dells and on the terraces it is deep, rich, and well watered, whether by perennial streams, or the heavy rains almost daily swept in from the Atlantic. Here every natural requisite exists for the profitable cultivation of sugar, coffee, tobacco, cocoa, and other tropical and extra-tropical products. The fruits are of great excellence, especially the pine-apple, which for size and flavour can nowhere be surpassed. The mountain-slopes are clothed with wood to the water's edge; and

wherever there is a piece of sandy beach, tall coconut-trees and palmettos skirt the shore in close file and cluster in the re-entering nooks.

The inhabitants of the *Peninsula* are comparatively few; and among them are a remnant and some descendants of American negroes who immigrated into the country in 1824. They are settled chiefly in Santa Barbara, the chief town of the peninsula, and in the immediate vicinity. Quiet, of good repute, and moderately industrious, they retain the English language, and faithfully hold to the Wesleyan denomination; they mingle but little with their neighbours, and they maintain their isolation by habitual intermarriage.

Of the other inhabitants there is but little to be said: they are mostly a light-coloured cross between Spanish and Indian blood, with a sprinkling of British subjects from the Bahamas, of Americans and Italians, all congregated in and about Santa Barbara. The Creoles are excellent in the chase of wild swine (*cochons marrons*), with which the woods and uplands of the peninsula abound. And for this chase they have imported and otherwise got together a breed of dogs of great strength, activity, and courage.

The Bay of Samana presents a superficies nearly corresponding in outline and measurement to that of the peninsula. It is about 9 miles across from north to south, and some 26 miles in length due east and west, giving an area of say 240 square miles. The bay opens to the east, and is therefore exposed to the force of the north-east trades, which, once drawn within the inner barrier, conform to the line of the land. A chain of coral reefs, springing from the south coast outside the entrance of the bay, stretches obliquely across to within a mile and a half of the northern shore within the entrance; and the space thus left is further narrowed to about three-quarters of a mile by a cluster of islets that stand out from the northern extremity of the coral reef. Between these islets and the shore there is an easy passage for ships of the deepest draught; and, once inside, they are in a place of safety proof to all weathers. For, in the first place, the coral reef acts as a breakwater against the seas rolling in from the Atlantic; and, secondly, the bay, in addition to the shelter it could afford on its own bosom, has side-harbours on both the north and the south coast, of various capacities, where vessels, if still hard pressed, could run for safety.

The Bay of Santa Barbara on the north, 16 miles west of Cape Balandra, cannot be entered by vessels of more than 14 feet draught; and, when entered, careful pilotage is needed



to avoid the coral reefs and mud banks that obstruct the interior. The bay is protected on the south by a chain of islets, a mile or so in length, nearly parallel with the shore, and about a third of a mile distant from it.

The chief side ports on the south are San Lorenzo and Savana la Mar. By constructing roads across the eastern prolongation of Cibao, these ports might be made the commercial outlets of the great plain of Seybo, which occupies one-half of the eastern peninsula of the island. Samana Bay is already the natural outlet of the valley of the Yuna, La Vega Reale; and if to the commercial capabilities of these fertile regions be added the fisheries of the bay, it must be evident that here is to be found an extraordinary concentration of the material sources of wealth.

Speaking of the fisheries, I may mention that the inhabitants of the neighbouring shores affirm that whales sometimes visit the bay in great numbers, when vessels put out or follow in pursuit, and make well by their captures. I am inclined to think that, in such cases, the name of *whale* is given by mistake to the common dolphin, which abounds in these waters, and attains in them its largest size.

The advantages, maritime and territorial, of Samana, have, from an early date, been recognised. Passing over the attempts made upon it by the filibusters before they formed a settlement at Tortuga, and by the French when they wanted to expel the Spaniards from the island, let us come down to the present times, and we shall find that the position has been but yesterday, as it were, openly coveted by foreign enterprise, if not by foreign power. During 1869-70 the United States had there a naval station at a rent of 30,000*l.* a year. In 1872 the peninsula and bay were actually conceded to an American Company, which proceeded at once to operations. Santa Barbara de Samana was declared a free port; a commercial agent, with quasi-consular powers, was appointed; the American flag was hoisted. Further, the three islets that command the entrance to the bay, namely, Pascal, Alevantado, and Arona, were leased by the company to the United States Government for a naval and coaling station.

The subsequent history of the company is too fresh and too well known to need repetition here. The object of the company was that of all other companies, namely, profitable speculation. That object was not attained, and, after a short time, did not appear to be attainable. The enterprise consequently fell through, and disappeared without leaving a tangible vestige behind.

However that may be, Samana, with all its natural advantages, political and commercial, is still there, awaiting in solitude the enterprise of a future day—the advent of more auspicious times. It cannot be that it will have long to wait. For, be it observed, it lies at the entrance of the Caribbean Sea, on the direct line of traffic between Europe and Central America. Such a position is not to be neglected: and its value will be tenfold increased when the imperious duty shall have been accomplished of cutting a canal through the narrow ridge that separates the Atlantic from the Pacific.

It is now time to return to Monte Christi chain, from which I was led into a partial digression by the special interest attaching to Samana.

The chain is highest towards the east, where it may average 1200 feet or so for a length of some 40 miles as far as Mount Cucurucho; here there is a break in the ridge; and thence westward a slight diminution in height. At irregular distances along its whole length the chain throws up dome-shaped heights, some rising from the crest, some detached from it. Towards the middle part there is quite a group of those heights, of which the chief is Mount Diego Campo, with an altitude of nearly 4000 feet. This height is in the longitude of the Pico del Yaqui. About 4 miles south-west of Sella de Caballo, the western terminal point is Monte Christi, a table mountain about 800 feet high, from which the whole chain has been called, as well as the adjacent bay, district, and port-town.

From causes already explained, Monte Christi chain ministers but little to the waters of the Yaqui, but rather abundantly to those of the Yuna. The greatest breadth of the mountain is at the eastern end, where the spurs and foot-hills reach down to the sea, and form a somewhat precipitous line of coast extending from the neck of Samana round by Old Cape François to the rivulet Jobo, a distance of about 50 miles. Here the spurs recede and give room to a fine plain reaching as far as Mount Isabella, the conspicuous mountain that rises aback of Porto Plata to the height of about 2300 feet. From the middle of this part of the coast-line protrudes the bluff headland called Point Macoris, which, as well as old Cape François, gives useful bearings to the coast navigator; the former being in  $19^{\circ} 47' 50''$  lat. N. and  $70^{\circ} 22'$  long. W., the latter in  $19^{\circ} 40'$  lat.,  $69^{\circ} 52' 20''$  long.

There is no want of mountain streams in these parts; and the plain just mentioned is abundantly watered in its whole extent, especially by the meandering Yasica, which may almost claim the title of *river*. Some miles up this little river, a rather numerous settlement of American negroes is esta-



blished on its banks, the descendants of a colony of slaves brought into the country in 1824 from Florida by their owner, Mr. Kinsley. They were to be made free by a graduated process, intended to cover some years. But seeing the prize within easy reach, and waiting only to be grasped, they summarily asserted their freedom soon after landing; and at the same time settled down into a quiet, hard-working community, a character still maintained by the "Kinsley boys," their well-known appellation throughout the district and along the coast. The lands they occupy pass for the best cultivated and the most productive in the whole island, the staple of produce being the sugar-cane, to which the soil is eminently congenial.

At Porto Plata the coast and the back-lying country resume a mountainous character, which they retain for a distance westward of about 30 miles. The salient points of this segment of the coast are Capes Patilla and Isabella. The latter is commonly reckoned the most northern point of the island,  $19^{\circ} 58' 30''$  lat. N., which is less, however, by  $30''$  than the lat. of "Grande Pointe," the eastern barrier of Port-de-Paix.

From Mount Isabella, that overlooks Porto Plata, issues a small river of the same name, which drains this hilly quadrilateral, and falls into the sea hard by Cape Isabella to the westward.

One will, perhaps, be struck with the frequent recurrence of the name "Isabella" in the topographic nomenclature in these parts. There is the mountain, the river, and the cape of that name, to which is to be added "Fort Isabella," the ruined stronghold of one of the earliest Spanish settlements—a settlement abandoned almost as soon as established. When we work round to the south we shall come upon another group of the same name. Both north and south the name was thus profusely bestowed by Columbus in grateful homage to Ferdinand's wife, the Queen of Castile, who from the first had been his staunch patroness, and his main support in the accomplishment of his grand project of discovery.

From Cape Isabella to Point Fragata, a direct distance of 33 miles, the coast bends slightly to the south; and, curving inwards, approaches the main ridge of Monte Christi, which here exhibits a serrated and irregular outline. The line of coast is broken by frequent indentations which lie between the projecting roots of the mountain. And the prevailing rock here being limestone, a close-lying breakwater of coral reefs conforms exactly to the contour of the shore. This coral formation is called "the great mangrove reef," because on some of the islets which it throws up a soil has accumulated,

on which the mangrove (*Rhizophora mangle*) has taken vigorous root.

Here the chain of Monte Christi terminates in the peak Sella de Camballo, about 3900 feet high, and situated in lat.  $19^{\circ} 53' N.$ , long.  $71^{\circ} 30' W.$

From Point Fragata the coast bends abruptly to the south in a very irregular line, and forms the Bay of Manzanillo. This bay, though presenting a broad sheet of well-sheltered water, will never be much frequented by foreign navigation, or even by the coasting trade; for the coast is in great part formed of the alluvium brought down by the Yaqui and the Dajabon (river of Massacre), and is therefore low and marshy, while a broad band of shoal water renders approach difficult. A little outside to the north-west lies a group of coral islets, called from their number "the seven brothers." And at the inner angle or bottom of the bay, a deep creek, shaped like a pruning-knife, penetrates 5 miles into the alluvial plain of Canonigo, which lies between the Dajabon and the Macaboa, the lowest affluent of the Yaqui.

Dajabon is the Indian word for massacre; and the river of this name was so called because of the bloody conflicts that used to take place on its banks between the early Spanish and French settlers. From this river a plain extends westward with varying width between the mountains and the sea, nearly 40 miles, as far as the little River Rouge or Limbé, which springs from the north flank of the prolongation of Cibao. This strip of maritime land is called "the Plain of the Cape." It is chiefly composed of the detritus of the neighbouring heights resting on a foundation of limestone and coral, and is traversed at broad intervals by counterforts from the main chain, which exercise a beneficial influence both on the climate and the soil. The plain runs up in tongues between these protruding ridges, and is happily well watered by mountain streams and rivulets, otherwise it would be scarcely habitable by reason of the protracted droughts that but too often visit it.

Moreau de St. Méry, whose work closes with the year 1789, speaks of an anchor found at 900 fathoms from the sea, and at a depth of 4 feet in the soil, on an estate in the district of Limonade, which nearly adjoins Port Caracol, one of the ports of the plain of the cape. The anchor was of Spanish make; its stalk was 9 feet 9 inches long; and as it was off Port Caracol that the *St. Mary*, Columbus' ship, was wrecked on the night of December 24-5, 1492, St. Méry concludes that it belonged to that ill-fated vessel.

But how, it may be asked, did it get to the spot where it was found? The *St. Mary*, according to Charlevoix, stuck on a



reef about a mile and a half from the shore, and between that reef and the land there is deep water. Could the anchor have been ejected by submarine volcanic disturbance, and, wrapped up in other less ponderous matter, washed in by the landward rush of upheaved water that follows such disturbances? The region hereabout, let me add, is subject to violent earthquakes.

But another conjecture may be offered. In 1504 a small colony of Spaniards was established at the Bay of Caracol, at first called "Puerto Reale." Both then and subsequently in 1519 attempts were made to work the gold-mines found on the neighbouring heights; and the colonists, wanting iron for the works, and thinking they could reforge the anchor, may have hauled it so far inland, when, unable to get it farther on, they abandoned it on the spot where it was found.

From the River Rouge to Port-de-Paix, 25 miles, Mount Plaisance flanks the coast, and its spurs descend to the sea-line. Between the projecting ends of these spurs are hollowed out numerous little bays and inlets, in which the small coasting vessels of the country can find shelter, and fishing craft ply their trade.

Port-de-Paix is more an open roadstead than a port. But it affords safe anchorage, being sheltered by the island of Tortuga, or La Tortue, about 5 miles distant to the north.

The space between Port-de-Paix and Cape St. Nicolas is the *débouché* of the valley between the two terminal ridges of Cibao. The coast is low; and the back-lying lands are for some distance inland quite devoid of trees.

The harbour of Nicolas-mole, as it is called, is entered from the west, between Cape Mole on the north and Cape St. Nicolas on the south, three-quarters of a mile apart. Lying due east and west, the harbour gradually narrows for about a mile, when, having a breadth of not more than two furlongs, it bends to N.N.E. about three-quarters of a mile to the bottom. The inner harbour is separated from the outer sea on the north by a low isthmus about half a mile across. It is quite landlocked, with deep water and good anchorage throughout. At the bend lat.  $19^{\circ} 49' 30''$  N., long.  $73^{\circ} 22' 34''$  W.

It was here that Columbus first landed in Haïti, on the 6th of December 1492, having quitted Cuba on the preceding day with the firm conviction that that island was terra firma. He was struck with the security of the harbour, but did not fail to note the barren aspect of the surrounding country.

Negotiations, I may add, have not very long since been attempted for the acquisition of this port by a foreign power.

I have been somewhat particular in delineating the northern

features of the island, because to those parts the chief historic interest of the country belongs. As regards the present, they still maintain their relative importance. And it would not be in the nature of things that, with the manifold advantages they possess, they should fall to the rear in the future.

Returning now to the mountain-formation, I proceed to note that at the western extremity of the central segment of Cibao a ridge turns off to the south, and bends back like a retort for a distance of about 25 miles. Eight or ten miles from the end of this retort a fine peak stands out, from its crest called "*Nalga de Maco*," from which numerous spurs precipitously descend on both sides. In the recess formed by this retort the Artibonite, the chief river of *Haiti*, takes its main source, while its chief confluent, the *Guayamuco*, is supplied by the outer concentric ranges. This latter head-stream, enlarged in its progress by numerous tributaries, waters the fine valley-plain called *Savana de Guaba*, and joins the Artibonite nearly in lat.  $18^{\circ} 50' N.$ , long.  $71^{\circ} 45' W.$  About five miles farther down the Artibonite is further swelled by the junction of another confluent from the south-east, the *Cana*, which collects the waters that descend into the western division of the great plain of *St. John*. Thenceforward the Artibonite flows in a very meandering course, through the plain to which it gives its own name, and falls into the sea in about lat.  $19^{\circ} 16'$ , long.  $72^{\circ} 46'$ .

The southern rim of the oval, as far as yet explored, would not seem, in any respect, to offer to the topographer the same amount of interest as the northern. It has already been noticed, in a cursory way, it is true, but sufficiently perhaps for the purport and limits of this paper. Of the mountain formations, therefore, of the island there remains only for notice that part which I have designated the secondary chain of the south.

This chain is separated from the central system by a succession of valley plains and lakes which reach from the Bay of *Neyba* to the neighbourhood of *Port-au-Prince*, a distance of about 75 miles. Its east end rises abruptly from the water's edge, in long.  $71^{\circ} 5' W.$ , whence the chain runs nearly due west to *Cape Tiburon* (the cape of sharks), its western extremity. Its whole length is about 170 miles, of which say one-half lies within the main body of the island; the other half forms the ridge and backbone of the horn-like promontory which projects from the south-west.

Near its middle part the chain is somewhat broken in continuity, not far from the place where the southern promontory springs from the mainland. There is no integral name for the whole ridge; but it is called *Bahuruco* at the eastern end



La Selle in the middle of the eastern half, from the peak of the same name, that rises to a height of nearly 9000 feet, and towards the western end La Hotte, a lofty crest culminating in a peak.

Besides these names, the intermediate heights and peaks have local designations of their own, which it would not be easy to collect or allocate.

From Bahuruco as a base a triangular promontory extends south as far as lat.  $17^{\circ} 37' N.$ , where it terminates in Cape Beata. The surface of this promontory is mountainous, well watered, and densely covered with primeval forests. The whole region, up to the crest of Bahuruco, is possessed by a colony of pure negroes, who hold no intercourse with the other parts or inhabitants of the island. They are said to be descendants of French maroon (runaway) slaves; at any rate, they speak, it is said, a language that resembles the creole patois of the *Haïtiens*. In habit and mode of life they are described as savages of the most unalloyed type, wandering naked through their untouched forests, and living by hunting and fishing. Never crossing their own frontiers, they are most jealous of the intrusion of strangers. Armed with bows and poisoned arrows, they warn off all approach, whether by sea or by the difficult passes of their mountain barrier.

Of the streams that water this promontory, the chief are the Nayanco, on the east, and the Pedernales, on the west. This latter marks on the south, as the Dajabon does on the north, the boundary line agreed upon in 1776 between the Spanish and the French parts of the island.

The whole of this southern chain keeps close to the shore. At the western extremity a secondary chain, called "*Mornes de Macova*," runs parallel to La Hotte for a distance of about 40 miles. So that the whole promontory may be said to consist of a mountain ridge and its counterforts. Between these counterforts there are some fertile dells; and a strip of fine land nearly margins the coast all round, spreading out in places on the north side into undulating plains. Such are the plains of Nippes, Miragoane, and Leogane.

The coast lands are well watered by streams that descend through the dells and ravines. These streams are too inconsiderable to be particularised, with the exception of La Grande Rivière, which falls into the Bay of Jacmel on the south, and, with more pretension, the Leogane on the north, which, rising in the Sierra de la Selle, runs a course of nearly 40 miles. Parallel to the Leogane, and within short distances, are the lesser streams Le Bateau, La Froide, and, farther east, La Grande Rivière du Cul-de-Sac, La Blanche, and La Creuse. The three

latter rise in the Sierra de la Selle, and fall, the two first into the sea, north of Port-au-Prince, the third into the Laguna del Fondo, of which more presently.

Springing from Loma de Barranca, on the southern rim of the oval, a broken and irregular ridge strikes eastward and loses itself in the mountain mass that intervenes between Azua and Sto. Domingo. Through a deep gorge in this ridge the southern Yaqui, or Neyba, one of the four primary rivers of the island, finds a passage, as already noticed, to the sea. Going on eastward, we cross in succession the Tabara, Hura, Ocoa, and Nizao, all secondary rivers, which descend from the oval, and, forcing their way through the ridge just mentioned, work their difficult courses, in parallel lines, to the sea. The Nizao hems in on the west the core of the mountainous block we are traversing. This core past, we come on the Nigua, then on the larger Jaina, and, farther on, to the Ozama, which bounds on the east the mountainous region.

The Ozama has numerous outspreading confluent and tributaries, which give to it on the map the likeness of a leafless oak. It may be considered the chief of the secondary rivers of the island. Yet it is not navigable, except for canoes, for more than 10 miles from the sea, namely, to the point of junction with its confluent, the Isabella.

Observe, the name *Isabella* here crops up again.

The segment of country between the Jaina and the Ozama is abundantly watered by transverse streamlets, which not only serve to fertilize the soil, but offer to help in turning to account the known wealth of the district in precious minerals.

Stretching eastward from the Ozama is the great plain of Seybo, about 85 miles in length and 15 in average breadth. It occupies the southern half of the eastern extremity of the island, being the correlative of the terminal part of Cibao which covers the northern half. This plain is abundantly watered by five rivers which traverse it in their descent to the sea. Their names are: the Ozama, Macoris, Soco, Quiabon, and the Yuma. There is a sixth, called the Bruguelas, which, flowing midway between the Ozama and the Macoris, disappears under ground about 20 miles from the coast. All these rivers are formed from numerous, wide-branching affluents supplied by the cross-valleys of the mountain range to the north. The Macoris is navigable for a greater distance into the interior than the Ozama.

The sea margin of the plain of Seybo consists of a honey-combed wall of limestone rock some 40 to 50 feet high, from which the land slopes upwards about as much more, then subsides so as to form a natural embankment. Along this line of



coast there is no sea inlet where vessels might ride at anchor. The mouth of the Macoris could receive sea-going vessels, but it is open to the south, from which quarter the most dangerous winds in these parts blow.

The great plain of Seybo is in part savana, in part forest. I cannot here do better than quote the description given of it by Mr. Gabb: "The savanas continue to beyond Higüey, interrupted by strips of timber along the streams, and a little clump occasionally in low places, where the drainage of the water supplies a greater amount of moisture than over the other parts of the plain."

"Coming from the west, the first intimation of the savana is the occasional appearance of a little grassy opening in the woods. These become larger, more numerous, and close together, until finally the country becomes one continuous park, carpeted with green, dotted by clumps of trees, through which the cattle roam in herds, while here and there may be seen the palm-thatched cottage of a herder, embowered in a cluster of coco-nuts. On its northern margin the boundary of the savana is exceedingly irregular; it is encroached on by numerous spurs of the mountain, and, in its turn, not only sends long tongues back into the hills, but even surmounts them in places. A very few of the hills are entirely grass-covered, while many of the outer ones are divided between grass and forest."

Such is the grand plain of Seybo. It has the character of being specially adapted to pasture and cattle-breeding, as the plain of the lower Artibonite is to cotton, and the plains of Cul-de-Sac and Azua to the sugar-cane. Accident may at first have determined these special cultures, and habit continued them; but wider experience cannot fail to show that the productive capabilities of those lands admit of no such restriction.

*Lakes.*—There are but few lakes in those countries where the disposition of mountain and valley, and the nature of the component rocks, are favourable to the growth and constant flow of rivers. The foregoing pages show that the conformation of Haïti favours the free flow of water. Accordingly there are but few lakes or marshes in the island. In the northern and central parts none are to be found. But in the depression which separates the oval from the detached chain on the south there are land-locked reservoirs, which may be said to constitute all that there is of lake-system in the country.

These lakes are three in number, two large and one small. The former lie end on, that is, they have the same axis, and they are separated by a low belt of land about 6 miles wide, which is often covered in the rainy season. When this happens, the united expanse of water is of rather imposing dimensions,

being about 45 miles long by 8 in greatest width. Taking the lakes separately, the larger lies to the eastward, and is about 27 miles in length by 8 in greatest breadth. It is called in French, *Etang salé*, in Spanish *Xaragua*, and also *Henriquillo*, because the Indian cacique Henry, who so long withstood the Spaniards, had his hiding-place in a small islet standing in the middle of the lake. This islet conforms to the contour of the lake, is about 5 miles long and 1 broad, and is called Cabrito, from the wild goats which are now its sole tenants.

Etang Salé receives on its north side the waters that descend from Mount Barranca; on the south, those of Baburuco. It is very deep, and as it has no outlet the waters are carried off only by evaporation, which in these regions is very active all the year round. Hence the waters that remain are very salt, and emit a strong odour. The lake swarms with fish in great variety, together with caymans, the alligator of the country.

The other lake bears the name of Lago de Fondo, and also of Etang Saumâtre, because of its brackish waters. It is about 16 miles long by 4 in average breadth, and is chiefly fed by four streams from Mount La Selle that enter it on the south side.

The level of these lakes above the sea has been stated to me at 300 feet. From a glance at the features of the surrounding country, this figure would appear to be, at least approximately, correct.

The small lake alluded to is called Icotea de Limon; it lies on the south side of Etang Salé, and is about 5 miles in length by 2 in breadth. It is of fresh water, and must therefore have an underground exit, for there is none on the surface.

The other lakes are Rincon, which communicates with the River Neyba (southern Yaqui), about 15 miles from its mouth, and Lake Miragoane, on the north coast of the south-western promontory. To these may be added three reservoirs called Lakes Navarro, curiously placed on the top of a lofty eminence near Loma de Tina, and also a few perennial pools at the western end of the plain of Seybo.

I do not include in the list the few coast lagunes of the island, as they belong more to the class of salines than to that of lakes.

*Ports.*—The island is but sparingly furnished with ports, and the distribution of those it possesses is partial and unequal. Two stand out immeasurably before the rest, namely, Samana Bay and Port-au-Prince. The former has already been described, not as a port *in esse*, but *in posse*, reserved for future enterprise. The latter merits a rather detailed notice.

Port-au-Prince lies at the bottom of the great triangular bay



embraced by the two horn-like promontories that project, the one from the north-western, the other from the south-western, extremity of the island. The island of Gonave, 36 miles long and 27 miles distant from the apex of the triangle, acts as a barrier against the western winds, and a breakwater against the western waves; so that inside of it there is never a tumultuous sea or a force of wind dangerous to well-secured shipping. The island of Gonave divides the breadth of water into two channels, which, with moderate care, are of safe navigation, both going in and going out. The area of anchoring ground may roughly be taken at 200 square miles. But close into the apex there are coral-reefs, which oblige vessels of deep draught to lie out about a mile and a half. These reefs could easily be removed, or, at any rate, a passage could be cut through them; and then, with the construction of piers and quays, vessels of any tonnage might safely move close in shore, and the shipping and landing of goods and passengers be rendered as easy as at Liverpool or New York.

Proceeding northward from Port-au-Prince, we come first to St. Mark's, lat.  $19^{\circ} 7' 0''$  N., long.  $72^{\circ} 45' 0''$  W., a small bay open to the west, with deep water close in shore; a good deal frequented on account of the trade it supplies in coffee of a superior quality.

Gonaïves, lat.  $19^{\circ} 25' 42''$  N., long.  $72^{\circ} 42' 52''$  W. In reality a large bay open to the west,  $3\frac{1}{4}$  miles wide at the entrance, and nearly 4 miles deep; but divided into two by a little island, separated from the mainland by a narrow channel that projects from the bottom and bends to the north. The southern division is called Tortue (Turtle) Bay; the northern, Hospital Bay. The harbour of resort, as well as the town of Gonaïves, lies to the north of this latter; it is exposed to the south-west.

The next port is St. Nicolas-mole, which has been described further back, and also Port-de-Paix, the first anchoring-place on the north coast for vessels bound eastward.

Passing over some 25 miles of coast which offers nothing to arrest attention, we arrive at the Plain of the Cape, which is rich in ports and harbours. The first is Acul Bay, lat  $19^{\circ} 50'$  N., long.  $72^{\circ} 17' 16''$  W., an inlet 4 miles deep and nearly 2 in average width, with deep water, good anchorage, and complete shelter inside. But it is difficult and sometimes dangerous of approach by reason of the coral-reefs and sand-banks that beset the entrance.

Next is the harbour of Cape Haiti, lat.  $19^{\circ} 46' 40''$  N., long.  $72^{\circ} 10' 42''$  W., a large roadstead open to the north and north-east, and obstructed inside by numerous coral-banks, which can be avoided only by careful pilotage. These passed there is a fine

expanse of deep water and good holding ground. Here was the first capital of the French settlement in Haïti, Little Paris, as it was called by the colonists. It was destroyed by an earthquake in 1842, and as yet has been but partially rebuilt. Still it is commercially an important place, and is the chief, almost the only, outlet of the great plain of the north.

Some 10 miles farther eastward is the Bay of Caracol, called by the Spaniards Port Royal. It is open to the north; the entrance is a good deal obstructed by coral-reefs, and on account of the numerous streams that enter it the water all round the land is very shoal. This port is but little frequented. Lat.  $19^{\circ} 41' \text{ N.}$ , long.  $72^{\circ} 0' 0'' \text{ W.}$

Still holding eastward, we come next to Fort Liberté, the Port Dauphin of the French, lat.  $19^{\circ} 44' \text{ N.}$ , long.  $71^{\circ} 51' \text{ W.}$ , a perfectly land-locked basin of about 15 square miles, with deep water and good anchorage over all; safely approached from without, and entered by a narrow strait about a mile and a half in length. Yet its many advantages notwithstanding, this port is scarcely used, chiefly owing to the shipping monopoly acquired by the neighbouring harbour of Cape Haïti.

Manzanillo Bay offers no good harbour, for the circumjacent land, as already noticed, being all alluvial, the inshore water is shoal for a considerable distance seaward. In fact, from Fort Liberté to Samana there is no good port or harbour on the north coast. Port Isabella is little more than an indentation in the land-line, and is only permissively called a port, in compliment perhaps to Columbus, who, as before noticed, thought to establish there his metropolitan settlement. Porto Plata presents the surface appearance of a safe and commodious harbour, and may, in reality, have been so in former times. But now the entrance is beset with coral formations, and the inshore curve is rimmed with concentric bands of alluvium, which are constantly pushing the anchorage farther out.

From Samana round by the east coast of the island there is no port until we come to Santo Domingo, the capital of the republic of the same name, situated at the mouth of the river Ozama. The pretension of this place to be a port can be admitted only by craft that draw less than 12 feet of water, and that can turn round within half a cable's breadth. Large sea-going vessels must lie off near a mile from land, where there is good anchorage in 7 or 8 fathoms, but where there is always a heavy swell, at times forbidding communication with the shore.

No amount of expense or labour can ever make of Santo Domingo a port or harbour for sea-going ships of the present day. Nor is it a well-chosen sight for a metropolis and arsenal, seeing that it is exposed to easy bombardment from the sea.



Coasting westward, we come, after some 50 miles, to the great opening which terminates inland in the twin bays of Ocoa and Neyba. This inlet forms the area of an amphitheatre of mountains, which in some places descend to the water's-edge, forming a steep, repellant coast; in other places they recede, leaving a shore of easy approach. On entering this opening from the east, we come at once upon an inlet which seems to promise all that can be desired for the reception of shipping. This inlet is called Calderas Bay, lat.  $18^{\circ} 12' \text{ N.}$ , long.  $70^{\circ} 36' \text{ W.}$  Lying east and west, it is about 2 miles long by 1 broad, with entrance at the north-west, so that it is thoroughly sheltered from every wind that blows. Nothing could look better to the eye. But soundings give a different story. The entrance and nearly the whole interior are so obstructed by mud-banks and coral-reefs that this attractive basin is almost inaccessible to vessels of deep draught. These obstructions could be removed, and, comparatively, at no great expense. Removed they will be some day, and then Calderas Bay will become one of the chief ports of the south; for it is within easy distance of auriferous mountains, of some of the finest sugar-cane lands in the island, and of fisheries that might be made to rival in value both the gold-mines and the cane-fields. Such a well-placed harbour cannot for ever remain neglected.

Round the southern promontory that ends in Cape Beata there is no harbour. Holding a still westward course, we arrive at Jacmel, lat.  $18^{\circ} 13' \text{ N.}$ , long.  $72^{\circ} 34' \text{ W.}$ , a nearly circular bay about a mile in diameter, open to the south-east. The necessities of commerce have made a harbour of this bay, although it is often dreadfully scourged by storms from the south and south-east.

Twelve miles farther on is the Bay of Bainet: it is like that of Jacmel in character and position, but on a much smaller scale.

Five or six miles westward of the Bay of Bainet we pass Cape Raimond, in lat.  $18^{\circ} 6' \text{ N.}$ , long.  $72^{\circ} 51' \text{ W.}$ , the eastern extremity of the Sierra de la Hotte. This chain hugs the sea in its whole length, except at its culmination, where it throws out a mountainous promontory terminating in the points Abacon and Gravois. Separated from Point Abacon by a channel about 5 miles wide is the island La Vache, 9 miles long and about 2 broad, parallel in its length to La Hotte, of which it is in fact a typical outlier.

In this part of the coast a number of deep inlets penetrate more or less inland between projecting spurs of La Hotte. They all contain deep water for a good way down, some to the very bottom, and would constitute excellent ports if they were more

accessible, and if they were backed by a greater breadth of productive country. Acquin, lat.  $18^{\circ} 12' N.$ , long.  $73^{\circ} 23' W.$ , and St. Louis, lat.  $18^{\circ} 14' N.$ , long.  $73^{\circ} 33' W.$ , are both ports of easy access. But the adjoining lands yield but little to attract commerce. Caution must be used in approaching the parallel inlets of Meste and Flamand, for coral formations of rapid growth and immense extent obstruct the way.

Due north of the passage between Point Abacon and Ile de Vache is situated, on the coast, the town of Cayes. It is fed by a fine tract of rolling country, extending far back among the roots and counterforts of La Hotte. Cayes, however, is not a port, but is fronted by a roadstead which is not at all protected from the south wind, and but partially from the east and south-east. For vessels of deep draught, the approach to it is rendered intricate by the coral formations already noticed. And here I would observe that the soundings in these waters, published with corrections to 1868, are no longer an infallible guide for navigation.

Observations taken from the north-west point of Ile de Vache give for the Bay of Cayes lat.  $18^{\circ} 6' N.$ , long.  $73^{\circ} 43' 40'' W.$  Hence all round to Port-au-Prince the only good natural harbour is the Bay of Baraderes, situated on the north side of the promontory in lat.  $18^{\circ} 34' N.$ , long.  $73^{\circ} 40' W.$  It is, however, but little frequented, owing to the scarcity of local produce and population. But so imperious are the exigences of commerce, even in an early state of development, that several indentations of the coast are made use of as ports, and some of them are visited occasionally by the foreign steamers that trade with the country. Such are—Jeremie, Miragoane, and Petit Goave.

*Adjacent Islands.*—Taking the dependent islands in the order of magnitude, the first is Gonave, the natural breakwater of Port-au-Prince. It is 32 miles in length by about  $8\frac{1}{2}$  in breadth, and is covered with forests of mahogany and other valuable woods. The soil is excellent and the climate delicious; yet the island is uninhabited, unless by a few unnoticed squatters.

La Tortue, or Tortuga, off the north coast, opposite Port-de-Paix, is 22 miles long by about 5 in greatest width. Like Gonave, this island abounds in fine timber of various sorts, and was once celebrated for its coffee and tobacco. The historic associations of La Tortue, connected as they are with buccaneers, filibusters, and the first settlement of the French in these parts, are of more than common interest.

La Saône, or Adamanay, is separated by a narrow strait, called Bocca Catuano, from the south-east point of the mainland. It is 15 miles long by about  $3\frac{1}{2}$  in breadth. Though very fertile, it has lain uninhabited since the disappearance of the Indians.



L'Île de Vache, off Cayes, has already been mentioned. It is admirably situated for a fishing station, abounds in feathered game of great variety, and is of such fertility that it could produce live stock, fruit, and vegetables in quantities sufficient for the supply of the neighbouring mainland.

Great Cayemite, 5 miles long by about 3 in breadth, lies off the peninsula of Bec à Marsouin (Porpoise's Snout), which helps to inclose the Bay of Baradères on the north coast of the southwestern promontory.

La Beata, 5 miles long by about 2 broad, is separated from the cape of the same name, the most southern point of the mainland, by a channel some 4 miles wide. It is, I believe, at present uninhabited, although formerly it contained both plantations and cattle-pens.

Besides those islands there are numerous islets in various parts off the coast, but all too small to merit notice, mere specks emerging from the waves, some with names, some without. Of those with names I would merely mention Catalina and Catinita, off the south-east coast; and Alta Vela, 7 miles S.S.W. of the island of La Beata. This islet covers an area of about 500 acres, and owes its name to its conical shape, which gives to it at a distance the appearance of a ship under sail. This bit of land has a little history of its own in connection with a deposit of phosphate of alumina which it contains. The transactions respecting this deposit within the last few years have acquired a certain notoriety in commercial circles both in London and Paris.

One more island is claimed by Haïti, but the claim is in abeyance. I mean Navasa, which is situated (north-west point) in lat.  $18^{\circ} 24' 30''$  N., long.  $75^{\circ} 3'$  W., 33 miles from Cape Tiburon (Haïti), and 70 from Point Morant (Jamaica). It is about 2 miles in length by a mile and a half in breadth, and is a flat rock, apparently of volcanic origin, rising to a height of about 300 feet above sea-level. All round the coast line exhibits an abrupt overhanging cliff, some 20 feet high, with only one break admitting of approach, which is at the north-west. There is no spring or fountain on the island, and no vegetation beyond a covering of low shrubs; but sea-fowl in great quantities inhabit the cliffs, and the surrounding waters abound in excellent fish of infinite variety.

Here, on this island, there is a valuable deposit of phosphate of chalk, in working which an American company has successfully been engaged since 1855. All necessary plant and machinery have been brought from the United States; and a body of skilled hands are constantly at work, for whose wants every provision has been regularly organised.

The deposit would seem to be of great extent, and the substance to be of good quality, while no diminution is heard of in the *out-put*. The undertaking would therefore appear to be attended with profitable results.

Omitting Navasa, the islands and islets above mentioned share respectively the physical characteristics of the coast they outlie. Saona is rather low, like the adjacent margin of the plain of Seybo; but through each of the others there runs length-ways a fragment of mountain-chain, which might easily be identified with the parent mass.

*Tides.*—The rise of tide depends in a great measure on the prevailing wind, which in these regions is an almost perennial north-east. On the north and east coasts the rise may, approximately, be taken at 3 feet; on the south or lee side of the island, at from 2 to 3 feet; and at 1 foot on the west, that is, in the great western bay, where the air-currents of the outer ocean are but little felt.

*Variation of the Compass.*—The variation of the compass is at present, and has been for a good many years, with an eastern tendency. At Samana it was  $1^{\circ} 20'$  E. in 1872, and  $4^{\circ}$  E. at Cayes in 1868. At Navasa it was  $4^{\circ} 20'$  E. in 1862, and was nearly stationary. The notes which I have at hand show an annual decrease of about two minutes in the amount of variation.

*Climate.*—Mr. Moreau de St. Méry writes as follows of the climate:—"From the conformation of the surface of the island, which alternates in mountains and plains, there results a great variation in its climate and temperature. This is chiefly owing to the situation of the island in the region of the trade-winds; for the prevailing east wind, of which the island feels the influence in its whole length, produces currents of air between the mountain-chains which refresh and temper the same—an advantage not shared by the plains, inasmuch as the ridges sometimes intercept these currents or change their direction. Moreover, a host of local circumstances, such as the elevation of the land, the quantity, more or less considerable, of water which irrigates the plains, the scarcity or abundance of forests, &c., have a sensible influence on the character of the climate.

"Without these counterbalancing causes, the temperature would be insupportable, unless by those designed by nature for such a climate.

"To the tempering influence of the wind must be added the nearly equal length of day and night throughout the year; and also the abundant rains, which refresh the atmosphere, and, after saturating the soil, reascend in part in cooling evaporations.



"The summer and winter seasons are more marked in the mountains than in the plains; and, as a rule, atmospheric changes are more frequent in the former. On the heights one never feels an intense heat, and those violent winds are unknown which parch rather than refresh the air. The thermometer seldom rises there above 76° Fahr., while on the plains and in the towns it often marks 100°. The nights sometimes approach even to coldness, so that a fire in the evening is a real enjoyment. Not that the cold is excessive, for the thermometer on the mountain-slopes seldom falls below 60° or so; but any change of temperature is so sensibly felt in tropical latitudes that the words *cold* and *heat* have not there quite the same meaning as in temperate regions."

Such are the observations of an accurate observer, slightly abridged in translation.

The unequal fall of rain in the eastern and the western regions of the northern part of the island has already been noticed: and its causes and effects have, in part, been explained. The south coast is somewhat differently affected in the matter of rain, being subject to a more equable atmospheric action, which guarantees those parts, if not from excessive rains, at any rate from droughts. While the central parts of the island, thanks to the lofty wood-covered mountains, never lack a full supply of moisture.

The western coast—that is, the land which lines the western bay—is provided for in this respect by a different law. The outer winds are drawn aside from their westward course and sucked in to replace the strata of rarefied air that ascend from the heated lowlands during the middle hours of every day. This sea-breeze, bending round the two horn-like promontories that inclose the bay, sets in nearly every forenoon, and, as it advances down the bay, discharges its load of moisture in partial showers along the coast. It often happens that the whole supply is exhausted before Port-au-Prince is reached, or that the rain-bearing strata pass over to the highlands of the interior. Hence occasional droughts are known in the low-lying circumference of the capital; and there are seasons of dry weather every year which act very sensibly on health and vegetation.

In this district the period included between the middle of November and the middle of February is normally rainless. Heavy rains, with thunder and lightning, are expected about the spring equinox; they fall in abundance in April, May, and June; are less frequent, and sometimes fail altogether, in July and August, usually to recommence in September, and continue, with intervals, until November.

These remarks are confined to the western plains, and are by

no means of strict or regular application. For, though meteorology has its fixed laws, its action appears to our limited knowledge to be sometimes capricious.

No meteorological observations have for many years been made in this island. For the following notes I am indebted to the work of Moreau de St. Méry. They were taken at Trou, on the plain of the cape, in lat.  $19^{\circ} 35'$  N., long.  $71^{\circ} 53'$  W., about 8 miles from the coast, at the foot of the mountains, at what elevation above sea-level is not mentioned.

1783	.	51 inches rain in	76 days.
1784	.	77	109 "
1785	.	43	81 "
1786	.	58	85 "

The rainy months in that region are, adds the same writer, June, July, August, September, October, and November. (Instead of calling these "the rainy months," it would be more correct to say that they are "the months in which rain usually falls.") They gave as follows in rain and rainy days:—

1783	.	24.50 inches in	38 days.
1784	.	49.00	71 "
1785	.	20.25	51 "
1786	.	40.50	61 "

It was remarked, continues M. de St. Méry, that of these four years the most favourable to agriculture was 1785, because it had been preceded by a very rainy year, during which the rains had been equally distributed—a circumstance which infinitely increases their effect. On the other hand, the year 1786 was one of drought, the wells dried up, the pools, the mountain streams, and even some rivers failed, although more rain fell in that year than in 1783 or 1785. But the drought had prevailed from November, 1785, to July, 1786; so that the evaporation was very great in the first rains that succeeded this long period of expectation.

"During these four years the greatest elevation of the barometer was 28 inches 4 lines; its least, 27 inches 6 lines.

"The thermometer marked  $104^{\circ}$  for the greatest heat in the shade; 66 for the least.

"The dominant winds were N.E. by day and W.S.W. by night; the most rare, the N.W. and S.E.

"Fifteen shocks of earthquake were felt in those four years, of which only two were very sensible, namely, those of June 18, 1784, and July 11, 1785. They undulated from W. to E., and without a trembling movement (*mouvement de trépidation*).

"The 5th of May, 1786, there prevailed at Trou an insup-



portable heat. The wind was s., varying to eastward and westward. More than two hundred mahogany presses and tables flew and were split from top to bottom."

To these notes of St. Méry I would add that this is a country of earthquakes, though now perhaps in a less degree than formerly. In 1564 the town Concepcion de la Vega was destroyed by one of these disturbances. In 1760 the same fate befell the nascent metropolitan city of Port-au-Prince; and so lately as 1842, the beautiful town of Cape Haïtien, the pride of Western Haïti, was in the same way reduced to a heap of ruins. I was near forgetting the terrible earthquake of 1751, which, among other widespread damages, entirely destroyed the town of Azua in the south.

Shocks still occur in various parts of the island; but, as it would appear, with decreasing intensity.

In the plain of Cul-de-Sac, lying aback of Port-au-Prince, a subterranean detonation is sometimes heard in the spring and autumn, followed by a sharp vertical shock of double or treble movement. This phenomenon, locally called "Gouffre," is produced by some cause as yet unexplained. It is much feared by the inhabitants, more perhaps from superstition than an apprehension of danger; for, so far as I have been able to learn, the Gouffre is not a destructive sort of disturbance.

St. Méry concludes, from certain indications to be met with in the eastern parts of the plain of the cape, that volcanic action once existed in the neighbouring mountains. He may be right, but later observers are silent on the subject. It must, however, be borne in mind that this island has as yet but in part been subjected to scientific exploration.

The skirts of the hurricane which, starting from the Caribbean Sea, swept through the West Indian Islands in September, 1875—its skirts, I say, brushed along the south coast of Haïti, extending some leagues inland, but without doing much damage. And this year an unusual heat prevailed through all these western regions during the month of August, when England was visited with unseasonable cold and rain.

*Geology.*—All the lands washed by the Gulf of Mexico and the Caribbean Sea are in a state of continual emergence. This is made evident by an examination of the upland soil, which in many places will be found to consist of rocks of submarine formation.

The following notices are taken from Mr. Gabb's treatise on the geology of this island, published in vol. xv. of the Transactions of the American Philosophical Society.

"No formation older than the Secondary has been found in the island; the oldest group being the great mass of slates,

conglomerates, and limestones which form its core. These are uptilted and broken by numerous intrusive masses of crystalline rocks, which may be, for convenience, grouped under the generic name of Syenite, since they almost invariably consist of the three necessary minerals, quartz, feldspar, and hornblende.

"Flanking the slates, &c., of the Sierra, there is a broad development of Tertiary marking all the northern and a part of the southern side of the island; and this, in turn, is bordered by a more recent deposit of limestones and gravels, which I shall call 'the coast formation.'

"The Sierra group forms all of the mountain mass of the interior length of the eastern republic; and it seems to form at least one, if not both, the long peninsulas of the west. It also constitutes the greater part of the peninsula of Samana, and appears as a single little outlier, under the Tertiary, near Porto Plata. It everywhere shows the evidence of active subterranean forces, being not only metamorphosed, with hardly a single local exception, but is everywhere much uptilted, and usually strongly folded.

"In the interior of the mountains, especially in the western two-thirds, the disturbance has been greatest; and the reason appears in the existence of great masses of eruptive rock, which have pushed up the slates, broken them, and, in some cases, penetrated them by dykes, to a distance of several miles from the parent mass."

"In its original state, this group of beds seems to have consisted of a series of clay-shales, thinly bedded, others more heavily bedded, and with layers of sandstone conglomerate, limestone, and heavy-bedded sandstones. The changes produced in these rocks by metamorphism are almost infinite."

Farther on Mr. Gabb says: "Almost everywhere the metamorphosed slates carry quartz-veins, sometimes barren, sometimes auriferous." Those nearest to the intrusive rocks are always gold-bearing, and those at a distance from them are invariably barren. Further, every stream running through the metamorphic rocks, in the immediate neighbourhood of masses of syenite, carries gold in its sands, while all those running exclusively in the Syenites, or at a great distance from them, are without the precious metal."

In conformity with these data it has been found that the waters of the Nigua and Jaina, of the Nizao and Ocoa, all flowing through the mountainous region west of St. Domingo city, carry gold; and the same may be said of nearly all the tributaries of the Yaqui which descend from the northern flank of Cibao.



Mr. Gabb sums up his opinion of the auriferous capabilities of the country in the following observations:—

“I do not wish to be understood as stating that there is sufficient inducement to bring foreigners here with the exclusive object of mining gold. Usually the gravels are not rich enough intrinsically; or where they are, the quantity in any one spot is so limited, that mining on any large scale is not likely to be profitable. Nor, again, do I wish to discourage the detailed examination of the quartz-veins. They are numerous; and some of the pieces I caused to be examined gave returns that would be considered very encouraging in California. Occasionally a vein can be found that, on account of its thickness, extent, general appearance, and the results of assays of its quartz, would certainly be opened in California. I know of no reason why it should not be in *Sto. Domingo*.”

These opinions, the result of personal researches conducted under the light of modern science, must command respect, and even be deemed authoritative. In deference, therefore, to them, we must consent to modify the ideas previously entertained of the abundance of the precious metals in this country; which ideas were derived from the older writers, who were themselves led by the reports of others, and who, in their enthusiasm for the subject, were sometimes apt to paint everything occidental in hues of gold.

Upon the subject of coal Mr. Gabb speaks in terms so absolute and decisive as here to merit a full place. “So much has been said,” he observes, “about the coal of this island, that it is necessary to refer to it more explicitly than circumstances would otherwise warrant. Throughout the country, wherever the upper parts of *Miocene* are found, there are small beds of an exceedingly impure lignite. In no case do the seams exceed three or four inches; and in no case is the material more than an imperfect lignite, earthy, and crumbling readily on exposure to the air. In a country like *Sto. Domingo*, where the demand for fuel is so limited, and the supply so extensive, a coal must be of extraordinarily good quality to warrant mining. In that case it might be made available for sea-going vessels or for export. It could never be much in request for home-consumption; and, unless sufficiently good for export, it is necessarily valueless.”

*Mineral Waters.*—Minerals naturally suggest the presence of mineral waters. Of these there is an abundance in the island; but they are little noticed, and not even commonly known. The virtues of chemical waters are not always instinctively appreciated; and springs of extraordinary quality are by many regarded only as something curious, without any idea of the

value of their properties. It is chiefly from memorials of the last century that I cull the following notes:—

*La Cuvrière.*—A short distance inland from the bay of Moustique, between Port-de-Paix and St. Nicolas-mole; so called from a very fetid source that issues from a calcareous rock, and falls into a basin 10 feet in depth and in diameter, whence it escapes by a fall of some 20 feet.

The water, on issuing from the rock, is cold, limpid, and colourless; but it emits a strong odour of decomposed sulphur, and suffocating exhalations at the approach of rains and storms. In the basin it is white, bluish, and soapy.

*Port-à-Piment*, in nearly the same longitude as the Bay of Moustique, on the south coast of the horn; seven springs within a small area; very curative.

*Dondon*, Plain of the Cape, mineral springs; ferruginous, vitriolic, and aluminous.

*Plaisance*, in the upper valley of Les Trois Rivières, which falls into the sea at Port-de-Paix, ferruginous springs.

*Arcahaie*, on the west coast, at the foot of Mount Terrible; copper, very abundant; emit an odour so strong as to have obtained for the waters the name of Sources Puantes.

*Banica*, on the upper confluent of the Artibonite; four copious springs.

*Mirabalais*, on the Artibonite.

*Jacmel*, on the south coast.

*Dame Marie*, or *Dalmarie*, *Irois*, and *Tiburon*, on the extremity of the south-west promontory.

These springs, it will be observed, are all in the western part of the island, where the French were established. I have no notes on the subject relating to the eastern part. But I may observe that the acidity of Lake Xaragua or Enriquillo is popularly attributed to percolation from the mines of rock-salt in the foot of the mountains that descend to the northern shore.

*Vegetable Kingdom.*—The vegetable kingdom of *Haïti* is very extensive, and it has been considerably enlarged by the introduction of exotics. Descourtilz has done much for the illustration of this subject in his voluminous work entitled '*Flore pittoresque et medicale des Antilles.*' To afford an introductory glance, I transcribe as follows from a useful little volume called '*A Guide to Haïti*,' edited by Mr. James Redpath, and published in Boston, U.S., in 1861:—

"An inhabitant," says Mr. Redpath, "of the temperate zones can hardly conceive how rich *Haïti* is in every species of vegetable wealth. She has every tree and fruit and flower of the tropics in her plains; and there is nothing that grows in the



States or in Canada that cannot be successfully cultivated on her highlands. Land alike of the pine and the palm, of the bread-fruit and the strawberry, of the gigantic cactus and the lowly violet, for richness of verdure and variety of vegetable products *Haïti* is not excelled, perhaps not equalled, by any country in the world."

As tropical trees and plants are now pretty generally known, it will suffice here to note a few of those productions of the island that are chiefly made use of by man, beginning with plants:—

*Indigenous*.—Tobacco, cotton, rice, Indian corn, cocoa, ginger, indigo, castor-oil tree, arrow-root, pimento, manioc or cassava, banana, plantain, artichoke, pine-apple, yam, sweet potato.

*Imported*.—Sugar-cane, coffee, indigo (distinguished from native by epithet "*franc*"), bamboo, grape, bread-fruit, peas, beans, melons, lucerne, cabbage, guinea-grass, &c.

*Imported Fruit-trees*.—Orange, almond, apple, mulberry, fig, mango, caïmite.

The two last have taken readily to the soil, especially the mango, which has now spread over nearly the whole island; and its fruit has become, one may say, a necessary article of food to the people.

On the exotics a few remarks may not be without interest.

Foremost in commercial and economical importance stands the sugar-cane. The first plant was introduced in 1506 by a Spaniard named Pierre d'Atenza, who brought it from the Canary Islands; and the first sugar-mill was set up by a proprietor in the eastern part, named Gonzalez de Veloza.

There are extensive tracts of land in this country where the cane has gone on these fifty years past, annually reproducing itself by spontaneous growth, often attaining 24 feet in height and 5 inches in diameter; whereas in other sugar-producing countries, and some, too, of high repute, the cane must be planted afresh every three or four or five years, and in Florida even every year. Here, in fact, it requires no further care than to be cut down when it reaches maturity.

Of the coffee-tree a story is told that two young plants were sent as a present by the Superintendent of the Botanical Gardens at Amsterdam to Louis XIV., who sent them to the establishment of Jesuits at Martinique. Here they were successfully cultivated; and, some years after, the Jesuits sent some plants to their brethren settled at Dondon, in the northern part of this island. Tended with skilful care, these plants thrived abundantly, and became the fruitful origin of a product which soon took its place next to sugar as a commercial staple of the island.

The native indigo, called *bâtard*, *marron*, or *sauvage*, was at one time largely cultivated, though inferior to *l'indigo franc*, which had been introduced some time in the 17th century. In some places both suffered fatally from the attacks of a peculiar insect; nor can the plant resist torrential rains. In 1694 Governor Ducasse wrote home to say that, with a monopoly, he would undertake to furnish *Haïtian* indigo of prime mark in quantities sufficient for the whole consumption of France, and have a large surplus for other markets. The offer was not accepted. The cultivation of indigo has long ceased in *Haïti*.

The bamboo was imported from Martinique in 1759. At first it thrived marvellously; but, after a while, it was attacked by a destructive insect, which to this day prevents its wide diffusion through the island.

The poplar and the willow were introduced about the same time as the bamboo; but neither succeeded.

The grape, orange, almond, apple, mulberry, and fig have degenerated, chiefly, perhaps, from want of care.

The breadfruit-tree took well to the soil, and is now common throughout the island. But the fruit is not esteemed by the inhabitants.

Amongst the botanical productions, medicinal, narcotic, and poisonous plants deserve a more detailed mention than can be here accorded to them. The use of poisonous plants is, from time immemorial, a revered science in the estimation of *Haïtian* negroes, known to but few, and jealously regarded as the distinguishing right of hereditary priesthood. The African word "*wanga*," which would seem to denote the art of poisoning, the poison, and the poisoner, is heard with awe by the *Haïtian* of African origin.

*Woods*.—Under this head the variety of production seems to be almost infinite, and the supply inexhaustible. Of the class called *incorruptible* the following are only a few. The locust-tree (*Hymenda courbaril*), Brazil-wood, rose-wood, cinnamon-wood, gri-gri, iron-wood, cypress or cedar of Bermuda, which often yields a spar 60 feet long and 18 inches in diameter; the yellow *Acoma*; the *Yarai* Palmetto, excellent for submarine pile-driving, as it is proof to the effects of sea-water; and many others. The island furnishes magnificent pines, of which some may be seen 80 feet high and 2 in diameter; also a species of oak (*Bignonia quereus*), as firm as that of Europe, and impervious to worms. Then there are forests of mahogany of the best quality, both speckled and wavy; satin-wood, red and yellow; and of dye-woods, fustic (*Morus tinctoria*), *Myrthus cotenifolia*, *Saurus sassafras*, *Malphigia ureus*, and many others,



including logwood, which was imported from Campeche in 1730, and is now widely naturalised in the country.

The palm-tree of the Cape of Good Hope, the date-tree of Senegal, and the paper-mulberry of China, together with the bread-tree, were brought to the country late in the past century, and were entrusted to the care of the Jesuits at Cape Haïtian, who had an extensive nursery attached to their Hôpital de la Charité. How it fared with the three trees first mentioned I have not been able to learn; the bread-tree has already been noticed.

I must not forget the Manzanillo, which seems to be confined to La Tortue. But it is diligently burnt down by the natives, lest the land-crabs on which they love to feast should eat of the fruit and become poisonous.

*Aborigines*.—When Columbus discovered Haïti in December, 1492, the island was peopled by a couple of millions of a very low type of the human race, an off-shoot, as was afterwards seen, of the inhabitants of the mainland.

As this insular branch of the widespread American family is now extinct, it may not be out of place here to borrow, through the pages of Charlevoix, a few notices of them from the historians Oviedo and Las Casas.

Columbus, still possessed with the idea of an East Indian discovery, called these people *Indians*—a name which, with the progress of discovery, spread to their congeners on the mainland, and, by a singular admission of error, was allowed to remain, and is now stereotyped by almost universal sanction.

These so-called Indians, however, are of Mongolian origin: and the group of them in Haïti, nearly isolated as they were, acquired some peculiar habits and characteristics of their own. In appearance these islanders had a debased resemblance to the continental Indians: the men were beardless, and all were of a feeble temperament, phlegmatic and melancholy, weak in intellect, almost without passion or impulse, and both morally and physically defective.

This is the general description that has been handed down to us; and yet we know that some of these Indians, under their cacique Henry, were able to make a long stand against the Spaniards; and that their kinsmen in Samana and all the eastern parts could repel the invasions of the ferocious Caribs. These Caribs were cannibals; they inhabited Florida and some of the lesser Antilles; and the object of their descents on the coast of Haïti is so tersely described by Charlevoix that I cannot do better than describe his words:—"When these barbarians made prisoners, they first killed the men, ate their entrails, and salted their flesh; the male children they kept to

eat at their feasts, to which end they used to shut them up in pens to fatten. The young women they took to their homes, and made slaves of the old."

The necessity of repelling such evils as these could not fail to breed courage in the faintest heart.

How and when the Indians first reached Haïti is wholly a matter of conjecture; for they had no records, and their traditions, which were embodied in popular songs, did not reach farther back than the beginning of the reign for the time being. With the accession of a new cacique began a new series of songs, and the old series was consigned to oblivion.

According to the belief of the country, the human species took its origin in Haïti. The first man, say they, accompanied by the sun and moon, issued from the sacred cave near Dondon in the north. This cave is about 150 feet deep and as many high; the entrance is narrow, and the walls are covered with rude sculptures representing the objects of Indian worship, such as frogs, turtles, snakes, caymans, and monstrous imitations of the human figure.

And here I may mention that the late Sir R. Schomburgk, when her Majesty's Consul at St. Domingo, became there possessed of a rude stone sculpture representing a serpent forming a circle by grasping its tail in its mouth, the Greek emblem of eternity. The circle is about 18 inches in diameter; and, if I am rightly informed, Sir Robert presented this curious relic to a museum in Berlin.

Some silver pieces of 25 and 12 sous, coined for the Haïtian Government in 1815, bear this emblem on the obverse, to signify, perhaps, to the world that the Haïtian Republic, then in its eleventh year, was to last for ever.

The Indians called their idols by the name of *Zemés*; they made them of chalk, stone, or baked clay, and placed them as *Penates* in all the corners of their houses, and on whatsoever articles of furniture they possessed. They used also to tattoo outlines of them on their skin.

Their religion was entirely of a deprecatory nature, and was administered by priests called *Butios*, who, skilled in simples, practised at the same time as physicians, surgeons, and druggists. Charlatanism was one of the chief ingredients of their skill, of which the Spanish historians record some amusing instances. It was not, however, without risk that the *Butios* exercised the art of healing, for he was liable to be torn to pieces if a patient died under his hands.

In infancy the foreheads were flattened by compression, in order to render the skulls hard and strong; and this end was so effectually attained, that, if the early historians are to be



credited, Spanish swords have been broken on Indian heads without cleaving them.

Their domestic habits were very primitive, but by no means innocent. The grown people of both sexes went nearly naked; those in adolescence, like the children, quite so. Their food was chiefly vegetable, relieved at times by fish and game. Of the vegetables most in use may be mentioned—rice, Indian corn, millet, cassava, yam, and potatoes. Of these last they had several varieties, all good, including one called the “potato of six weeks,” because it was ripe within that time after planting.

They were hard smokers, and often indulged to stupefaction. On these occasions their way was to spread undried leaves of tobacco on slow charcoal embers, and, conducting the smoke into the stalk of a pipe shaped like the letter Y, inhale it through the two branches, into the nostrils. This pipe was called *tabaco*, which name was transferred by the Spaniards to the plant, the Indian word for the same being *cohiba*.

But it was not alone on tobacco that the Indians got drunk: they had also an intoxicating beverage obtained from Indian corn. Benzoni relates that women used to masticate the grain, and eject it from the mouth, when reduced to a pulp, on a platter or leaf, from which it was thrown into a jar with other ingredients, boiled, strained off, and left to cool, when it was fit for use.

Polygamy was common among these Indians; and when a cacique died, two from the number of his wives were buried alive with him. It was a case of volunteering which was always zealously responded to. The bodies of the caciques were preserved before interment in a rough way, very unlike the elaborate process of embalming practised by the ancient Egyptians, as described by Herodotus.

The agriculture was carried on chiefly by means of fire. Implements for the purpose the islanders had none; but after burning the savana, they scratched the surface with a stick, and then threw on the seed which the rain beat into the soil deep enough for germination. They understood the mode of producing fire by the friction of hard wood against soft. It was with fire also that they hollowed out their canoes from the trunk of the sand-box tree (*Hura crepitans*)—a tree useful for no other purpose.

Hatchets of a greenish, vitreous stone, of various sizes, but of the common form, are still found in considerable numbers in different parts of the island. They are now used by the Obee priests and priestesses of the blacks in their religious ceremonies.

Their arms were limited to a javelin of hard wood and a thick pointed stick.

Their houses were of two kinds; the one was a superior style of wigwam, that is: a capacious, single-chambered hut, generally of polygonal ground-plan, with upright walls about 6 or 8 feet high, from which sprang a conical roof. The other differed but little from the ordinary two-roomed houses of our own backwood colonists. Both kinds were built of timber, strongly put together, and well thatched, so that they were proof to both wind and rain.

Of the Indian language scarcely a vestige remains. Charlevoix pretends that it has bequeathed to us the words *tobacco*, *canoe*, *hammock*, and *hurricane*. The first I am disposed to admit, because it is from Haïti that the plant so called was first obtained. Still, it is curious to note, there is the Turkish word *chibook*, which, like *tabaco*, also means *pipe*; and the Persian word *tumbeki*, the tobacco smoked in the *nargileh*. About the other words I am sceptical, because we have the Latin *canna*, Greek *κάνα*, which came to signify a *small boat*. *Hammock* might, I think, be *Hangmatté* of the Germans, who have supplied so many of our naval terms. And for *hurricane* there is the low Latin *auragium* (from *aura*), whence the French *ouragan* and *orage*.

When discovered by Columbus, Haïti was divided into a pentarchy. The pentarchs were called *cacique*, which, in the language of the country, meant *prince*. They were hereditary; and, in default of direct issue, collaterals on the female side were preferred to those on the male, because of the less uncertainty of the blood.

The *cacique* ruled despotically; his judgments on crimes touching person or property were draconic, but they had the effect of maintaining order and security.

Such were the natives of Haïti when first brought under the eye of European observers. Not a remnant of them now survives; they died out with unexampled rapidity under the withering contact of the Spaniards. Self-destruction, the last resource of despair, exotic vices and diseases, and grinding labour under relentless taskmasters, swept them off by thousands and tens of thousands; so that in less than thirty years from the day Columbus landed on Haïtian soil, they had nearly all disappeared. There were a few Spaniards, and but a few, who were touched with the sad picture of a whole people dying out. Among these few was the licentiate Barthélemy de las Casas, who had been some years in the island as a teacher of Christianity. His mission was to the oppressed natives; and, by his active sympathy with their cause, he has merited the name of



"The Friend of the Indians." In 1517 this zealous apostle succeeded in procuring the issue of a royal edict, authorising the importation into Haiti of 4000 negroes a year, from the West Coast of Africa. The monopoly of this trade was granted to a Flemish nobleman, chamberlain of Charles V., who sold it for 23,000 ducats to a commercial house in Genoa.

This was the beginning of the "African Slave-trade." For, although some Africans had been brought to Haiti by Portuguese traders as early as 1505, and some more afterwards at odd times, no recognised trade of the kind existed across the Atlantic until 1517. And a good many years elapsed after the warrant had been issued, before the trade acquired a regular systematic form.

Passing over a hundred years or so, we find the Indians extinct, and Africans strongly planted on the soil of Haiti. The greater strength and endurance of the negro enabled him even to thrive under the discipline which had exterminated his predecessor; and to this day he holds his ground, though under very altered conditions. For in the beginning of the present century he became a free man; and there are now on this island two independent republics, in membership with the family of civilised nations, namely: the Haitian Republic, of French origin, and the Dominican, of Spanish. Of these the former, with one-third of the island as territory, has a population of about 550,000;\* the latter, with two-thirds of the island, a population of 150,000. In all 700,000 to a territory of 30,000 square miles, that is, 23 to the square mile. Now, speaking well within bounds, the island could support a population of 7,000,000.

Of the 550,000 Haitians, not less than 500,000, or ten-elevenths, are of pure African descent; and amongst them the female sex largely preponderate in numbers. They do not increase; indeed, many are of opinion that they decrease; and grounds can be stated for such opinion that would seem to be conclusive.

The Dominican population does not contain more perhaps than one-sixth of the pure African element; and while the creoles in that part of the country increase and multiply at a rapid rate, the most that can be said of the negroes is that they keep up to their number.

The black population of this country is descended from contributions furnished from all the tribes inhabiting that part of the West Coast of Africa inclosed between the rivers Senegal and Niger, together with contingents from Madagascar and

\* Others say only 450,000.

Mozambique. These tribes differ much in type, intellect, religion, and language. But here their descendants seem to have fused into one mass, and to have forgotten the distinctions of their forefathers.

But the African does not always change by transplantation; and in Haïti, left as he now is to the free exercise of his own instincts, he is as typical in tastes, habits, and mode of living as if he had never quitted the land of his fathers.

The language of the blacks at the east end of the island is good Spanish; at the west end, a very impure French patois.

Of the mixed races, or the mulattoes, there are about 175,000 all told, viz. 125,000 Spaniards and 50,000 French.

Attempts have from time to time been made to increase the population by immigration. In 1764 some 800 Germans were tempted out here by French proprietors. They were established near Dondon, where, in a few years, the most of them were buried. Some of the survivors were removed to St. Nicolas-mole; and there too they soon disappeared.

It fared better with the Canariens. I have no note of the time of their arrival in the island; but there is a settlement of them, numbering about a thousand souls, inhabiting one of the suburbs of Santo Domingo city, which they built for themselves and occupy exclusively. They possess extensive lands not far off, which they cultivate with care and profit.

Another prosperous colony of the same people is established at Savana la Mar, on the south coast of Samana Bay.

It is difficult to account for the failure of repeated attempts to attract hither black settlers from the Southern States and from the neighbouring islands. On three different occasions since the declaration of Independence, namely, in 1806, 1824, and 1859, the Haïtian Government has seriously taken up the question. Agencies were appointed, guide-books written, and large inducements offered, but all to little purpose. A few families came each time; of these, some went back in disappointment, some, to use a homely expression, went to the bad, and some held on with indifferent success.

The Indian names of this island were Haïti and Quisquica, the first signifying a mountainous country, the second a vast country. Columbus gave to it the name of *Espagnola* (Little Spain), which was latinized to *Hispaniola*. When the French had established themselves in force in the western part, they called the territory they occupied *Saint Domingue*, which name they extended to the whole island in 1795, when by the Treaty of Basle they became possessors of the eastern part. When the French blacks achieved their independence in 1804, they restored the name of *Haïti* to the portion of the island they had won: while



the Spaniards retained, and still retain, the French name of St. Domingue, modified to the Spanish form of St. Domingo.

Let me, then, for clearness' sake, briefly recapitulate. The island was called "Haïti" by the Indians, "Hispaniola" by the Spaniards, "St. Domingue," or "Santo Domingo," by the French. *Haïti* is now the territory of the Haïtian Republic in the west; Santo Domingo, of the Dominican Republic in the east. There is no integral name at present for the whole island.

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## VII.—*A Visit to the Gold-Fields of Wassaw, West Africa.*

By J. A. SKERTCHLY, F.R.G.S.

EARLY in March of 1877 I arrived at Cape Coast Castle in command of an expedition whose object was to inspect the gold-mines of Wassaw, one of the late subjugated districts of Ashanti. Several English and foreign expeditions had been fitted out for a similar purpose, in the hope of establishing a gold-mining company, in order to reap a portion of that rich auriferous harvest a few ears of which were being culled by the native miners. From one cause or another all these expeditions have failed: a principal reason being the attempt to form a mining company upon a plan similar to that on which companies are based in Australia, California, and other civilised portions of the globe. In Africa, however, we have difficulties to contend with which are not met with elsewhere. A climate enervating in the extreme, and which speedily finds out the weak spots in a European constitution, want of means of transport, a lack of food on the scene of operations suitable to Europeans, and lastly the innate and universal laziness of the natives—all these difficulties have to be met and overcome, rendering the task a by no means easy one. Still, however, I was determined to ascertain the practicability of Europeans working the mines of the Gold Coast, not by their own personal labour, as was attempted by the French and Dutch, but under their supervision. On the Western Coast of Africa, however energetic a man may naturally be, the enervating character of the climate is such as to take all the "go" out of the greatest enthusiast in a few months, while it would be impossible for any white man to work day by day in a similar manner to our navvies and miners.

Our first difficulty was to obtain carriers for our tools and stores. Everything had to be carried to the scene of operation on the heads of men and women along roads for the most part

mere hunters' tracks. The usual difficulties were met with. Half-a-dozen men would present themselves and agree to our terms, which, as we were anxious to get off ere the rainy season set in, were liberal. In a few hours they would return and say that they would *not* accept our offers, and the palaver had to be gone over from the very beginning. A shilling a day wages and 3d. per day subsistence was offered, accepted, and declined half-a-dozen times a day. Now a man educated in the mission-house would present himself and state that *he* could obtain us as many carriers as we required in a very short time if we would but engage his services. This would be done. The terms would be stated to the man, and he would be instructed to engage men upon those terms and no others. After some delay, perhaps a third of the number of carriers we required would be marshalled before us, and the head man would come in and state that he had engaged so many. Every little helps, and out we would go to inspect the gang. Yes, all were quite willing to go to Wassaw, but as to pay they would not accept anything like our terms, although they were higher than the government scale. The head man had gone to the villages and engaged men hap-hazard, never mentioning any scale of pay at all, and the result was disappointment. Again and again did this occur; but at last, through the influence of Capt. Hay, we did manage to secure a sufficient number of carriers for our requirements. Then came the question of loads. When carrying for themselves, a hundredweight is not over-weight, but when working for a white man, anything over 30 lbs. is "too much." I verily believe that if a Fantee had to carry 10 lbs., provided all the loads were of that weight, he would declare he could not sustain such a weight. The women carried better than the men, as was noticed during the Ashanti war.

At length loads were adjusted—I was going to say to the satisfaction of the carriers, but to a people who never are or will be satisfied such a thing is impossible; but at any rate the long line of carriers was started off to march along the beach to Chumah, where we, going by sea, were to meet them. From time to time, for hours after the main body had set out, carriers would return and declare that their loads were too heavy, and after long and energetic debate the matter would be settled, and they would start on again hours behind their comrades. At midnight on Sunday, 9th, we, the European portion of the expedition, set out by canoe for Chumah, taking with us our personal attendants and our cook, George Field, who afterwards proved the best man of the whole company. The water was "lumpy," the sea-breeze having been very strong all day; and



as our progress was directly to windward, we had not been long on board our vessel ere symptoms of *mal de mer* began to show themselves in some of the company. At daylight we were off Elmina, and rum was frequently served out to the canoe-men, in hopes of inducing them to keep on to Chumah; but they put into Commenda, and, dispersing among the houses, were speedily cooking their "chop" and indulging in deep potations of trade gin. Starting again at 3 A.M., we reached Chumah at daylight, and shortly after our arrival our carriers came trooping in, until the open space in front of our house was converted into a chaotic bazaar of tools, provisions, tents, powder, and guns, with salt fish, caukic, plantain, and other kinds of "chop" scattered among the packages, while a perfect Babel of tongues rendered the scene one of noisy confusion. By the aid of a little "spiritual" persuasion, the carriers were induced to go on 5 miles to Jembo, a hamlet situated on the top of a hill, where we camped for the night, distributing ourselves as best we might among the huts. In the morning, just as we were enjoying our early tea, one of the head men came in to say that the carriers refused to go on any farther. Inquiry elicited that the chief of Jembo had been tampering with the men, telling them that the road was very bad, the towns few and far between, and that in Wassaw they would be unable to buy food. The villain had done this in hopes that our men would desert us, leaving us and our property at his mercy, so that, after plundering us to his heart's content, he would be able to charge exorbitantly for carriers to convey our goods on to Wassaw or back again to the coast. A little strong language, however, brought this estimable chief to his senses, and after a lengthy harangue to our carriers we succeeded in getting away at 8.30 A.M. Our way led through a few villages, and then we plunged into a dense forest, with scarcely a sign of animal life except the butterflies and other insect forms which enlivened the open spots on the banks of the numerous creeks, now happily dry. At 4, a heavy thunder-storm, accompanied by deluges of rain, hurried us on to Monsu, a village of perhaps 500 inhabitants, where we resolved to stay for the night. The chief came to see us, and after accepting our "dash," a present of cloth and gin, promised to procure a sheep for us. Of course he never intended to perform such an unheard-of absurdity as keeping his word, and though we remained all the next day, drying our clothes and recruiting ourselves, no sheep made its appearance, although the chief turned up about every alternate hour with loud assurances that he had *sent* for it, and wished to drink our health. If everything that is "sent for" in Africa turned up,

what a happy land it would be! The next day's march brought us to Bansu, distant about 12 miles from Monsu, but with a long train of carriers with heavy loads this was quite a good day's work. Leaving Bansu the next morning, after spending a miserable night among the ants and mosquitoes, we reached Essecoomah on Saturday, fully determined to take a good day's rest on the following Sunday, for the heavy travelling up one hill and down another had told severely upon the staying powers of the carriers, while all the Europeans were only too glad of a spell.

By 11.30 on Monday morning we had reached Tacquah, our destination, and our carriers setting down their loads in the centre of the town, while we waited the advent of the king under the shadow of a clump of bananas, speedily became objects of speculation and curiosity to all the idlers in the place. Audience with his Majesty Quabina Anjo being over, we were conducted to our quarters, followed by the "tag-rag and bob-tail" of the town; nor did they leave us until darkness setting in shut us out from their unpleasant espionage. The next day we paid a visit to the property we had come to prospect; and, paying off all the superfluous carriers, set to work clearing the ground and making preparations for blasting the rock containing the auriferous reef.

At the time of our arrival there were upwards of 6000 men and women at Tacquah, all engaged in working the gold. The auriferous metal is found in a series of parallel reefs, descending at about the angle of 45, encased by walls of hard quartz and pseudo-quartz of a ruddy greasy look. These reefs have been worked from very early times, the country for miles around being honeycombed with holes and washing-pits. Of geology and mineralogy the natives have not the slightest idea, since we continually came across shafts put down in the most absurd positions. Indeed, it required a very sharp eye to detect the deserted shafts in many places, for they were sunk close alongside the path, or, indeed, in the old pathway itself, so that one had to travel by a series of zig-zags between the pits. These shafts are quite curiosities in themselves, being in some cases as much as 80 feet deep, and about 2 feet in diameter, sunk as straight as if they had been bored with a huge auger, and in not one of them was there a single stick of timbering. The mouths of the old shafts were in many cases covered loosely with fallen branches or leaves, so that the unwary traveller stepping upon them would suddenly find himself precipitated to the bottom, or, as was generally the case, into the accumulated water, which, in some cases, rose to within



a few feet of the surface. The shafts are dug by means of a small hoe, shaped somewhat like an Indian bassoolah, the iron being about 2 inches broad and 4 or 6 inches long. The workman squats on his hams and scrapes the sandy earth into a small calabash, which, when filled, is drawn up to the surface by his companions. The shaft is just large enough to allow the miner to turn round in, and means of ascent and descent are afforded by holes cut in the sides, into which the miner inserts his toes, after the fashion of the old chimney-sweepers' boys when ascending a chimney. Of course having no pumps, and baling, except on a very small scale, being impossible, operations have to be suspended as soon as water is reached, and indeed but little can be done at all during and shortly after the rainy season. In alluvial ground the gold is found in and beneath a stratum of blue clay, resting upon a substratum of hard rock, or in a layer of gravel. In some districts the whole of the sandy gravel below the surface-soil is auriferous.

Where reefs are worked, they have either been struck by sheer luck when sinking a shaft, or are outcropping reefs worked downwards from the surface to water-level. The latter is the case at Tacquah, where the strike of the reefs runs along the side of a hill, dipping towards the west at an angle of about 45 degrees. The head- and foot-walls are composed of syenite as hard as flint, through which the natives are unable to penetrate, so that, unless the reef itself is wide enough to allow a man to work in it, with elbow-room on each side, they can do nothing with it. The shafts run down with the reef at an angle of 45 degrees, and at Tacquah are about 40 feet deep. The tools employed are hammers, generally of European manufacture, about 2 lbs. in weight, and chisels made by native blacksmiths from the commonest bar-iron, tempered hap-hazard by being plunged into cold water. Others use chisels fixed into wooden handles like gouges, and with these rude implements, aided by the light of a palm-oil lamp, with a piece of rag for wick, they work in gangs of two or three day and night. At Tacquah there are rude ladders constructed of bamboo as means of access, and the mouths of the shafts are covered with a shed. By working all day, two men can cut out about a cubic foot of the reef. The quartz is placed in a calabash, which is tied upon a handkerchief and sent up to the workmen at the surface. These convey it to their homes, and set about the process of pounding it with hammers until it is reduced to powder. This, again, is placed on a slab of syenite or granite about 2 feet square, resting at an angle sloping from the operator on a crutch of three sticks, held

together by what sailors would term a grommet of rope. A handful of the pounded stone is placed upon the slab and rubbed fine with a stone shaped like a baker's roll, to which a slight rotatory motion is communicated as it is rubbed backwards and forwards on the slab. The ground quartz is caught in a calabash placed at the lower edge of the large slab, and, as a rule, it takes the whole night to grind down a cubic foot of stone, it being the custom for the miners performing this branch of labour to work all night, enlivening the time with songs and frequent potations of trade gin. The accumulated dust is carefully swept together, and the floor carefully gone over, so that every particle of the auriferous quartz is gathered up, and every three months or so the floor of the grinding-shed is hoed up and washed or "panned" off.

The ground quartz is then handed over to the wives of the operators, who invariably perform the operation of washing, and not unfrequently that of grinding too; and during the whole of my stay in Wassaw I never saw a male washing the dust, although female children of six or seven years of age not unfrequently engage in the work. The implements consist of a large wooden bowl about 3 feet in diameter, cut out of the solid, one or two similar but smaller bowls, a few feathers, a few calabashes, and a shell or two of the large edible snail.

Taking their stand knee-deep in the creek on one of the numerous water-holes on its banks, they place a handful or two of the dust on one of the smaller bowls, dip it under water, and pick out any large pieces which appear to contain gold, and which have escaped grinding. The residue is then washed, with exactly the same oscillatory motion as do the Australian miners with their prospecting dishes, the bowl being held above the larger one, which floats on the water beneath, being prevented from being drifted away by the current by the knees of the operator. As the bowl is rocked from side to side the lighter particles separate from the heavier, and are, after being carefully inspected, thrown on one side. This process continues until nothing is left in the large bowl except a mass of black sand, amongst which a few grains of gold sparkle in the sunlight. This washed sand is then placed in one of the calabashes and subjected to very careful washing, the calabash being rocked over a larger one, and this again over the largest, so as to catch every particle which might run over the edge. Gradually the amount is reduced until a thin line of auriferous particles is seen glittering along the upper edge of the sand; and this is then picked out with the feather and washed in a still smaller



calabash, until the dust is cleared of every particle of black sand. The gold is then carefully brushed into the snail-shell, with the feather, and thus the operation continues until the whole mass of rock is washed over. Each woman, as a rule, takes her stand in a particular hole, and when the washing has continued for some weeks, the water is baled out of the hole and the mud at the bottom panned off, and at the same time the floors of the huts where the stone is crushed are also subjected to their periodical washings.

The results vary considerably. The gold is so exceedingly fine, that in spite of all their care, and the expenditure of unlimited time and patience, the washers lose a very large percentage. Taking a fair average, we may say that cutting out will occupy one day, crushing a second, and washing two more—four days in all; the return being three pennyweights, to be divided amongst four miners and four washers.

The reefs belong to the king or to chiefs, who receive or are supposed to receive one-half of the stone cut out; but in most cases, when any stone is given as royalty, the miner takes particular care to pay the landlord in stone either utterly barren or from the least auriferous portion of the reef. The discovery of a pocket is the signal for a general debauch among the lucky finders and their friends; so that, as a rule, they are poorer after their rejoicing than before, for gin is up to 4s. 6d. a bottle at Tacquah, and he is a very poor miner who cannot put away a bottle on his own account before total insensibility deprives him of the power of swallowing. All large nuggets are the perquisites of the king, but these are seldom found, or, if found, are broken up so as to avoid the claim. The miners come in the dry season to Wassaw from all parts of the Gold Coast, and even as far as Monrovia and Lagos, while many arrive from the interior. What becomes of the gold dust is more than I am able to say; but it is certain that the quantity which makes its way down to the European factories is no criterion of the quantity raised. A large percentage is buried in the floors of the huts of the miners, who like to accumulate the precious dust in this manner, though its acquisition is of no more real use to them than are the hoards of the miser. It is true the natives have but few wants to supply—gin, cloth, tobacco, and powder being their principal articles of purchase; but it is strange that after the severe toil of the mines they should be content to bury the gold in jars in the floor of the huts during their lifetime, while at the death of the owner the precious metal is interred with him. A "resurrectionist" would be a lucrative profession in West Africa, for there are millions

buried in the graves of the chiefs and principal men, who during their lives lived from hand to mouth in apparent penury.

The gold is worth as it comes from the mines about *3l. 17s. 6d.* per ounce; but it must not be supposed that it would pay any one to go there to purchase it, for the "simple" natives are as well up in the arts of making "Brummagem" as their lighter-hued brethren.

Wassaw itself is situated between  $5^{\circ} 10'$  and  $5^{\circ} 40'$  N. lat. and between  $1^{\circ} 25'$  and  $2^{\circ} 20'$  W. long. The Prah forms its eastern, Duckera its northern, Aowen its western, and Ahanta its southern boundary. Of the number of its inhabitants I am unable to form an estimate, since the mines are resorted to by natives from all parts of the coast. Awuduah, the chief town of the district of Apintoe, has about 500 inhabitants, and Monsu about an equal number. Like all the West Coast, Wassaw is but sparsely peopled, the country being for the most part one vast forest, with meagre villages of a dozen huts or so, scattered at long intervals along the roads between the chief towns and the coast. The Prah and the Ankobar are the principal rivers, the latter running through the heart of the country, and being navigable for small craft as far as the rapids above the junction with the Boyinsa. The bar at the mouth, near Axim, has about 6 feet of water on it at low water, spring tides. The country is hilly, the ranges averaging about 400 feet, though the Okawe hills are stated to be nearly double that elevation. Most of the ranges are quartzose, more so towards the north, those to the south being basaltic. The forests abound with fine timber, some 8 feet in diameter; but the want of means of transport prevents their being used, except in the immediate vicinity. The average daily temperature is  $75^{\circ}$ , that of the night  $65^{\circ}$ . The climate is exceedingly moist, rain falling on the hills even in the height of the dry season on the coast. The rainy season commences in May and lasts till the end of August, when the dry season commences. In November and December we have rain again, followed by the short dry season, which continues till May. At Apintoe, in May, 16 inches of rain fell; in June 21, and in July 36, inches. With such a heavy rainfall as this, the aspect of the country is of course completely changed in the wet and dry seasons. The level patches of the dry season become either stagnant lakes or clayey morasses, while mere creeks or dry water-courses develop into mighty torrents or swiftly rushing rivers. As an instance of the change which a few hours will effect, I one day travelled from Tacquah to Apanukroom, a distance of 12 miles, without wetting my ankles.



Rain set in at 4 P.M., and continued till midnight. On the return journey the river Awabeh had risen 26 feet, and the creeks were overhead in water, each having to be waded through or swam over. Of roads properly so called there are none. A track, worn smooth by the passage of naked-footed carriers, winds with perplexing zigzags through the forest. If a tree falls across the path, the next traveller crashes through the bush to get round it, such a thing as clearing the way being undreamed of. As an instance on this point: beyond Insenunah there is a track a mile long, across which hundreds of trees have been thrown, apparently by some mighty tornado. Rather than take the trouble of cutting through these, the carriers step laboriously over each limb, the road being about as practicable as if a number of chairs were arranged side by side to be walked over, the traveller stepping on the floor at each footstep.

Though so rich in gold, the people are miserably poor both as regards clothes and food. The simplest product of the loom at Manchester suffices for a cloth, worn toga-like over the left shoulder. Maize boiled and made into a kind of hasty-pudding, called "cankie," or boiled plantains form the staple articles of diet, the occasions when animal food is eaten being rare indeed. Not that they are at all fastidious; for snails as large as rolls, mud-fish, frogs, rats, snakes, &c., are greedily devoured. We had the greatest difficulty in providing ourselves with fowls, while a goat was far more often thought about than seen. The houses are of the usual type, built of bamboo (*B. vinifera*), tied together with woody fibre, and thatched with the broad leaves of the palm or cane. There are very rarely windows, and the door is usually an oblong bamboo pane sliding from side to side on a strong wood fibre. The floor is of beaten earth, sometimes raised a foot or so above the level of the ground. Cooking is performed in black earthen pots set over three clay heaps, the boiled maize or plantain being mashed in a wooden mortar made from the stump of a tree, with a pestle like a short section of a clothes-prop. Knives and forks, plates, dishes, *et id genus omne* are unknown, though they fashion curious spoons out of the solid wood, or by tying a small calabash to a stick by way of handle. Those who are not miners support themselves by rearing stock for the Coast towns, or by making palm-oil obtained from the wild trees; for cultivation is unknown, and, if it were, too much trouble. Tobacco grows wild, but the lazy natives prefer to buy American leaf to that which grows at their own door. Cotton, rice, indigo, india-rubber, ginger, coffee, sugar, &c., grow abundantly, or would do so if cultivated. In their social and religious customs the Wassaws differ but little from

the Fantis and Ashantis. Fetichism is the prevailing form of belief, though the miners are far more superstitious than their agricultural countrymen. For instance, they believe that gold will run away from a man who has boots on, and on several occasions I have, by stepping on a heap of quartz, driven the owner shrieking away. Then again, if a man works on the king's birthdays (a weekly institution), he will obtain no gold; and if his lamp goes out he must do no more work that day. Gold moves about under the ground, and can only be found by a select few.

Such is a brief account of a country which, but for its being peopled by a race whose laziness is only equalled by their mendacity, might become as productive as India, but, until foreign labour is introduced, will remain in utter stagnation.

# VIII.—*From the Gold Region in the Transvaal to Delagoa Bay.* By Captain C. WARREN, R.E.

[Communicated by His Excellency Sir BARTLE FREER, Bart.,  
Governor Cape Colony.]

THE few observations I am able to make upon the country above mentioned refer to that portion between the Gold Regions about Leydenburg and Delagoa Bay, about 40 miles north of the proposed line of railway.

There appear to be three roads or tracks from the Gold Fields to Delagoa Bay, viz:—

1st. From Pilgrim's Rest by Macmac to Pretorius Kop to Lorenzo Marques.

2nd. From Leydenburg by Spitzkop to Pretorius Kop to Lorenzo Marques.

3rd. From Leydenburg to New Scotland, and thence to Lorenzo Marques.

The road from Pretoria to Delagoa Bay also lies by New Scotland. The route taken by our party in June 1877 was (No. 2) that from Leydenburg *via* Spitzkop Diggings.

The distances, approximately, are as follows:—

	Miles.
Leydenburg to Spitzkop .. .. .	35
"      Pretorius Kop .. .. .	30
"      Lions Spruit .. .. .	17
"      Crocodile River .. .. .	15
"      Komatie River .. .. .	15
"      Lebomba Bounds .. .. .	10
"      Lorenzo Marques .. .. .	46



The heights, ascertained roughly with an aneroid berometer, are as follows:—

	Feet above the Sea.
Leydenburg .. .. .	4350
Top of Pass .. .. .	6700
Spitzkop diggings .. .. .	4050
Pass .. .. .	4700
Niekerk's farm .. .. .	4200
Top of Pass .. .. .	5050
River .. .. .	1800
Camps near Pretorius Kop .. .. .	2100
Lions Spruit .. .. .	1350
Crocodile River .. .. .	450
Komatie River .. .. .	250
Lebomba Boundary .. .. .	450
Lorenço Marques .. .. .	..

From Leydenburg a district road has been laid out as far as Macmac with some care, with numerous cuttings in the rocky sides of the mountains, extending for several miles. Along this road the route to Spitzkop extends for about 20 miles, until the Macmac road passes near the Devil's Knuckles down by the Sabia River, and the Spitzkop track leads on over the mountains.

This road to Spitzkop at present is not much used, as the diggers at Spitzkop communicate with Pilgrim's Rest over the Spitzkop Pass *via* Macmac; it appears, however, to be used by the Boers to some extent.

No attention has been paid to draining or metalling that portion cut in the steep mountain sides, and consequently there are gutters running along and cutting up the roadway often two feet deep, making travelling with waggons very dangerous.

It has been laid out with due regard to the requirements of a Boer waggon-road, that is to say, it is carried along the sides of the hills at a slope of about  $\frac{1}{40}$  to  $\frac{1}{50}$ , and on reaching a very steep place is carried straight down it. In some cases these passes resemble a series of broken staircases with steps two feet high; in other cases they are simply steep slides. The road, as it at present exists, is only available for the transit of the strongest kind of South African waggon. We took down with us, on the occasion of our visit, a Scotch-cart with four oxen; the two wheels were lashed tight, and yet the slopes were so steep that it was necessary for four men to pull behind in order to prevent the carrying the oxen down the hill.

This road could not be made useful for general traffic without a very heavy outlay.

As far as could be learnt, the road from Pilgrim's Rest to Pretorius Kop is vastly superior to that from Leydenburg to Pretorius Kop, and could be made a good carriage-road. We

had no opportunity of seeing this road, which we heard had been much improved by M. Nellmapius, the ex-director of the Delagoa Road Company.

We joined this road of M. Nellmapius at Pretorius Kop, and proceeded along it to Delagoa Bay.

From Pretorius Kop to the Komatie River the ruling gradient is very gentle, the whole fall being only 1850 feet in 47 miles.

The ground here passed over consists of a succession of rounded hills with a fall to the north-east, with gulleys about 10 feet deep, at intervals of about one mile.

At 10 miles from the Komatie, the Lebomba range is crossed, at this point only 200 feet above the Komatie and 450 feet above the sea-level. Here is the boundary stone between the Transvaal and Portuguese territory.

From the foot of this range for about 20 miles the slope of the ground is scarcely apparent, and the soil is moderately hard for a road, but for the remainder of the distance into Lorenzo Marques the ground is swampy and uncertain, and is so light that even when quite dry the oxen sunk in 18 inches. On this road M. Nellmapius had evidently expended much labour to great advantage. Through the bush veld he has cut down a belt of trees about 15 feet wide; in the rocky ground he has removed the more prominent rocks, and in the marshes he has made a log-road in the worst places. He has also erected station-houses at intervals of about 15 miles, which are still in a good state of preservation, although they have been plundered during the Kafir war, and one of the station-masters murdered.

*Timber and Fuel.*—In the deep kloofs of the mountain-side there is much timber between Leydenburg and Spitzkop, but it is difficult of access. From Pretorius Kop to Delagoa Bay the bush veld extends, with more or less dense forests of hard- and soft-wooded trees; these trees do not grow to any size, being seldom more than five feet in girth. Various varieties of the acacia-tree abound. The wood might be made available for log-timber through the marshes, though not so well adapted to this purpose as pine-trees. It would also be sufficient for the supply of fuel for a line for railway for many years, provided the trees are properly thinned instead of being cut down *en masse*. The wood would also be available for sleepers, but it seems probable that they could be obtained cheaper from Europe.

*Labour.*—At the present time Kafirs from Delagoa Bay are coming to work on the Cape Town Railway. They take readily to clothes, are a merry people, and work well on a spurt, but are not steady workmen. These men would be available in

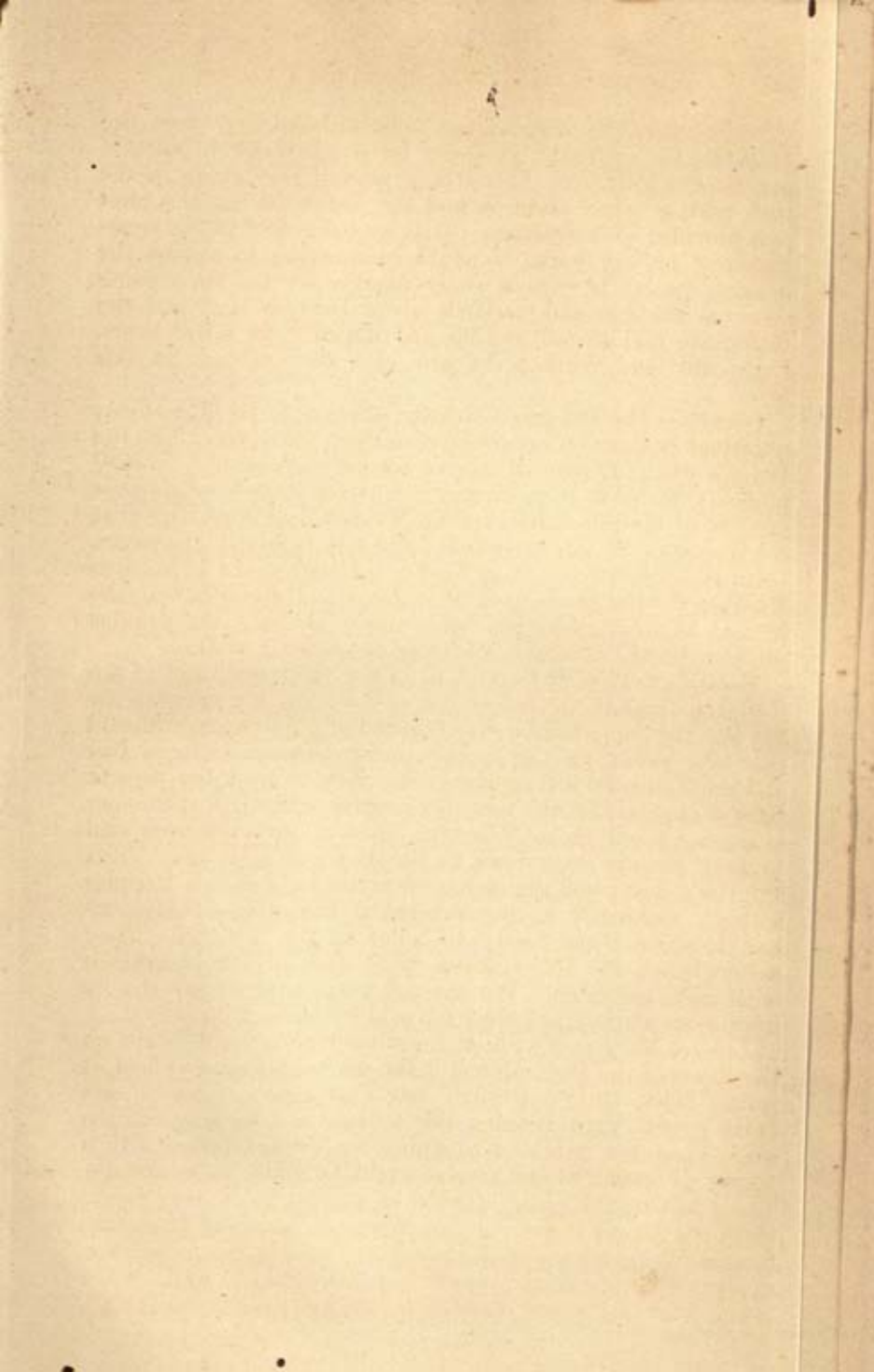


great numbers for any railway from Delagoa Bay into the Transvaal; they could probably be obtained for about 20s. per month, with food. Food is at present very cheap in the bush veld, as game abounds, and the Kafirs are for the most part provided with fire-arms. It is probable that in the prosecution of railway works it would be necessary to confine the working period to certain winter months, for the fever rages over the marshes and lowlands about Delagoa Bay, and the Kafirs are said to fall victims and die of it in a few hours. Europeans and Afrikanders are also very subject to this fever.

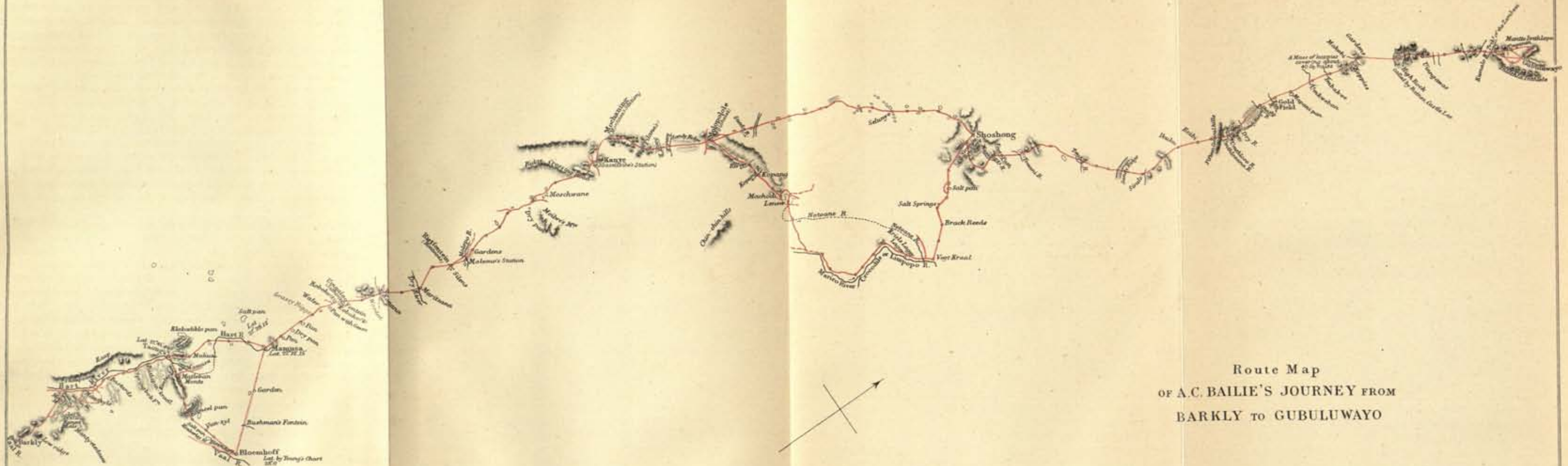
*Climate.*—The Delagoa Bay fever appears to be of a bilious remittent type, and is ascribed generally to the malaria from the swamps around Lorenzo Marques; the intensity of the fever may probably be due to these causes, but as the same fever prevails in some of the hill districts of the Transvaal, it is possible that the true cause of this dangerous fever may be found elsewhere. Until the present year every facility has been given at Lorenzo Marques for the production of malaria and fever, but at the present time exertions are being made to drain the swamps surrounding the town and otherwise to render it healthy.

*Tsetse-fly.*—This fly is said to follow the game, and if the Kafirs continue their present use of fire-arms, not only the fly but also the game will be exterminated in a few years. Should this take place, one bar to easy transit between Delagoa Bay and the Transvaal will be removed. But even at the present time it appears that the tsetse-fly country can be passed through at times without great difficulty. Two of our oxen were said to have already been down to the Bay and back again from Pilgrim's Rest; and the four oxen arrived at Lorenzo Marques without apparently having suffered in any way, although we had to drive them nearly 40 miles on the last day. They accomplished the 165 miles in eight days, giving an average of 21 miles per diem. We are not aware that we saw the fly during our journey, and the oxen sold for 5*l.* each on arrival.

*Lorenzo Marques* is a small town built on a sand beach on the shores of the Bay: around it the sea has hitherto washed, at spring tides, with impunity; but Portuguese engineers are at the present time draining this lowland and banking out the sea. There is a headland adjoining the town, supplied with a spring of water, where houses might be built to advantage. The trade in the place appears at present to be very slack; there are but six stores. There appear to be about fifty white men in the place, and very few white women. No jurisdiction appears to be exercised over the Kafirs beyond the walls of the town. There are several Banyan traders, who possess small shops.







Route Map  
OF A.C. BAILIE'S JOURNEY FROM  
BARKLY TO GUBULUWAYO

*Prospects of a Road from Delagoa Bay to the Transvaal.*—Judging by the high price of all European produce at Leydenburg, it would be highly advantageous to the country to open up a good road from the Bay, and, as far as we could ascertain from the state of M. Nellmapius' road, after it had been closed for several months during the war, the original road company commenced their work very thoroughly. The station-houses are as well made as the better class of Boer houses in the Transvaal, and the kraals for cattle, &c., are well designed.

The country between Pretorius Kop and the Bay appears to be swarming with Kafirs, who, though fond of hunting, evidently pay great attention to their crops, principally mealies and manioc.

At present the Kafirs carry up burdens of about 75 lbs. weight on their heads from the Bay, and from their kraals to Pilgrim's Rest. An organised party of men to carry goods along the road might assist in supplying the Gold Fields, but the difficulties of establishing a waggon transport with oxen do not seem insurmountable. The climate does not appear to be adapted to horses.

*Railway.*—As regards the prospects of a railway:—looking to the expenses of such works in other parts of South Africa, it does not seem probable that it could be constructed under 12,000*l.* per mile. Assuming that the distance to the high veld will in no direction be less than 150 miles, the cost would not be less than 1,800,000*l.*; but 3,000,000*l.* is not too high a sum to allow, keeping in view the nature of the work. The maintenance expenses over a line which passes for 40 miles over a swamp, and for 110 miles continually ascends to a height of 7000 feet will be very great. There appears to be no prospect of such a line paying for several years to come; but that it would materially help and hasten the development of South Africa there can be no doubt. At the present time, progress is very much retarded for want of iron and timber at reasonable prices.

IX.—*Report on the General Features of the Interior of South Africa, between Barkly and Gubuluwayo; to accompany Map of the Route.* By ALEX C. BAILIE, Government Land Surveyor.

THE route about to be described leads *viâ* Taongs, the Batlapin capital, where Mankoroane is chief; Mamusa, which is David Massouw's station (he being head of a very large Koranna family); Rietfontein, which is where Montsioa, the chief of the Baralongs, now lives; Kanye, the chief town of the Bamanketsi,



whose chief is Gaseitsibi; Molopolole, where Sichele, chief of the Bakwena, lives; Machodi, the head station of Leuceve, chief of the Bakgatla; and Shoshong the most central station of the interior, where Khame, chief of Bamangwato, lives.

Before proceeding further, I will give in a tabular form the approximate distances (as obtained by trochiameter measurements by me) from Barkly to each of the different stations, giving also the distances between each station for the convenience of reference.

From.	To.	Miles.	From.	To.	Miles.
Barkly ..	Taongs .. ..	78	Taongs ..	Mamusa .. ..	51
" ..	Mamusa .. ..	129	Mamusa ..	Rietfontein ..	98
" ..	Rietfontein ..	227	Rietfontein	Kanye .. ..	88
" ..	Kanye .. ..	315	Kanye ..	Molopolole ..	61
" ..	Molopolole ..	376	Molopolole	Machodi .. ..	44
" ..	Machodi .. ..	420	Machodi ..	Shoshong .. ..	166
" ..	Shoshong .. ..	586	Shoshong	Gubuluwayo ..	300
" ..	Gubuluwayo ..	886	Molopolole	Shoshong (direct)	128

From Kimberley to Barkly is 24 miles, making the whole distance from Kimberley to Gubuluwayo 910 miles round by the Limpopo River, and 828 when the direct road from Molopolole to Shoshong is used.

The first 18 miles from Barkly to Taongs is over strong hills and through sandy flats, after which, to the Hart River the soil is good and hard; the road then follows the east bank of the river over a series of limestone and sandy ridges, the latter studded with trees (fine mimosa), and then crosses the river into Taongs.

The Hart River is a narrow stream, with low sedgy banks in the wet season, which takes its rise above Mamusa and winds along the Transvaal border into Batlapin Territory, entering the province of Griqua-Land West above Springbok-fontein on the N.E. boundary, and joining the Vaal at Likatlong. In very dry seasons it often ceases to flow, but, even in great droughts, water is to be had by digging a few feet in its bed.

Taongs is situated among very stony hills, and contains a large population. It is not, however, a strong position for natives.

The soil about Taongs is very fertile, and capable of raising large crops of grain; but as the Batlapins do not irrigate, their crops are entirely dependent upon the rainfall.

Leaving Taongs for Mamusa the road crosses a hill, and after travelling 12 miles, a small Baralong village, called Mulium, is reached on a tributary of the Hart.

After leaving Mulium, the road crosses a succession of hills for 11 miles, when water is found in a small kloof about 200 yards on the east of the road. Thence down a long gentle slope and the Hart River is crossed. Then over a low flat sandy ridge. After this the road sometimes follows the Hart for a short distance and at others strikes across low grassy ridges with grey granite cropping out, until near Mamusa, when some sandy ridges are crossed.

Mamusa is situated on and about a grey granite hill, with one or two trees studded about its summit.

After leaving Mamusa the road crossed a hill or two and a level grassy plain was reached. About 9 miles from Mamusa water is found in a pan about  $1\frac{1}{2}$  mile to east of road.

Eleven miles further on there was a pan with water about 100 yards to east of road, and about half-way between this and the previous outspan was a dry pan, which in good seasons has water.

Then for about five miles you have low grassy ridges or swells—the soil is red and sandy. The next trek brings you to a pan about 50 yards to west of road, with water. Four miles further across a plain, and water is found in a large pan about 500 yards to east of road. This is rather a marked spot, as at the road, on the west side, there is a low stony ridge covered with scrub. Five miles again brings one to a very large pan, marked on the map as “Pan with geese.”

Nine miles over an undulating country, almost hilly, brings you to a pan, with a permanent fountain at the west corner. This is called Umgala—the resident so-called chief is a bushman called Jachim. The fountain at this place is slightly tainted with sulphur. Eight miles more, over grassy plains, undulating country, and a grassy ridge studded with bush, and a hollow is reached between two ridges. Here water was found down the hollow, about 1000 yards to west of road.

The country from Mamusa to this may be described generally as high and level, undulating gently, with occasional saucer-like pans, and not a tree the whole way.

Three miles further on, you come to the first hills from Mamusa. Here one road from Taongs comes in on the west. The country is pretty, being well wooded with mimosa-trees.

Nine miles through hills, where there are trees and Kaffir gardens, and Konana is reached,—this is one of “Montsioa's” out-stations, and is in charge of “Nathaniel.” Here there is a



permanent supply of water, obtained by making shallow wells in the bed of a dry rivulet.

And here I would like to say that wherever water is mentioned as being "in Pans," the supply cannot be depended upon for drought; although I believe that in every place where I found water on my way up, the supply must (except in very exceptional seasons) be permanent. My reason for this supposition is that I travelled this part of the journey just before the *very* dry season of 1876 was broken up by rains.

Eighteen miles through a country that is bushy and undulating (almost hilly), and you come to the Maritzana River. Here, although water is always obtainable in very dry seasons, it gets scarce. Maritzana is a sandy river which seldom runs, but water is found at a few feet below the surface.

From Maritzana to Rietfontein is 18 miles. This portion of the road is grassy with wood—not thickly wooded. The soil is red and good, though sandy: a succession of low, flattish ridges are between Maritzana and Rietfontein. Rietfontein is where Montsioa now lives; it is a tributary of the Molopo River, being 7 miles from that river over a gentle decline. At Rietfontein there is abundance of water. Molemo's station is on the Molopo. He is a subject (younger brother) of Montsioa's. Up to this, what wood there is is all mimosa.

After leaving Molemo's, the road for 33 miles crossed a succession of well-wooded, sandy ridges. Water is, even in the best seasons, very scarce here. Limestone occasionally crops up. At this outspan there are cross-roads, one running east and west, and another branching to west. Two miles on, road comes in from Konana on west. About 1 mile on saw a hole, where water was got at about 8 feet under a red sandstone boulder. Trees of different kinds and capital pasture.

About 6 miles further on, hills are seen E.N.E. about 12 miles off; these were said to be at Moilwe's station. Two miles on, a pan is on the east of road, and about 100 yards off the road in a direct line to the middle of the mountains mentioned above. A mile further on, and a large flat ridge with a sandy soil and abundance of wood of different kinds of acacia.

From this place to the Matabeli country the country is thickly wooded with good timber for beams or poles. The trees put out leaves without rain early in spring—at least they did in the spring of 1876—which, together with other observations of my own, and information gained from traders and natives, leads me to believe that water can be found very near the surface all over the interior along the route traversed by me. The absence of underwood in the interior forests strikes one.

The country consists of large, flattish, sandy ridges, with

shallow valleys, occasional pans, and limestone cropping up on the ridges.

Ten miles on, a large pan is reached, where a road branches off to north-east. There is a small stone hillock in this pan:  $\frac{1}{4}$  mile on, a large pan is crossed, with groups of boulders in it. Quarter mile more and road joins from lower Molopo on west. Three miles more brings one to a large pan, and 4 miles beyond this is a permanent water called Moschwane or Vaal-pense-pan. From here a range of hills is sighted, running from south-west to north-east roughly.

The last stage described is a very heavy one, the sand sometimes reaching one-third diameter of the wheel. Six miles on, a dry valley was reached in a hollow. Road crosses a few small hills from this, and winds among the range of hills sighted before, for 15 miles, to a stony valley. From this the road winds among hills up a broad valley, with gardens and trees; range of hills still continuing to east. This range is really a succession of ranges or double hills. After travelling along 5 miles, water is found in shallow wells, about 6 or 8 feet deep, dug in a rivulet. Four miles more bring you, after winding through a gorge, to Kanye, Gaseitsibe's station. About 3 miles from Kanye, a road enters from south-west. Kanye is 3756 feet above the level of the sea.

From Kanye to Mochaning, where Montsioa lived at the time I went up country (September 1876), is a distance of about 12 miles over a few rather stony ridges. At Kanye a large supply of water is obtained by sinking wells less than 10 feet deep, through a yellow sandy soil.

At Mochaning there are very strong fountains.

From Mochaning the road winds up a long valley for about 15 miles, and then crosses between a row of stone koppies (huge boulders piled upon each other), the passage where the road passes being not more than a hundred feet wide. Then another mile on and a similar range of koppies is passed, parallel with the former, though not so marked. The first range of koppies is very peculiar, the hills in some cases being terminated in a single stone.

Three miles more and a petty chief, Pilana, who has married one of Sichele's daughters, is found located among some stony hills. From Kimberley to Molopolole, the only country which can be said to be naturally fortified by hills, stones, and cover, is that lying between Mochaning and Pilana's, its only drawback being the want of water. At Pilana's there is abundance of water. From this to Sichele's is an undulating country with sandy soil, and two sand rivers in which water can be got by digging a few feet. From Pilana's to Molopolole is 28 miles.



Molopolole is situated on a hill with other hills in the foreground, which command it. It would still, however, make a good fortress if there were any probability of getting water on the hill. The hill on which Sichele's town is built is very rocky, and, in addition to this, is covered with hillocks of stone and great boulders under which the native huts nestle. The water supply is abundant, even in dry weather. In the immediate vicinity of the town there is no wood. This remark applies to all native (interior) locations, even where I have described the country as well wooded.

From Sichele's to Shoshong is 128 miles by the nearest route, but as this is in the tropics and is across a gently undulating country, with only two permanent waters, and the heaviest sand I have seen in the interior, it is only traversed in the best seasons without risk. Here again, at the risk of becoming tedious, I am confident that water could be obtained at a very small cost. At each end of this road the country becomes hilly. Indeed every native town in the interior, except Montsioa's, is among hills.

In consequence of the disadvantages mentioned in connection with the short road from Molopolole to Shoshong, the more circuitous route by Machodi and the Marico and Crocodile, or Limpopo, rivers is often travelled.

From Molopolole to Machodi is 44 miles, through a rich undulating country, with a yellowish sandy soil and two permanent waters which divide the road moderately equally for travelling purposes into three stages. The trees still remain principally acacia. The grasses all over the interior are exceedingly rich. Thirty miles from Machodi, crossing a dry river, called the Notoane, in which water is found only in the best seasons, twice within a few miles, across a heavy, sandy country, which undulates gently, and the Marico is reached.

From this the road follows the Marico for 27 miles to its junction with the Crocodile. Thence it follows the Crocodile for 45 miles. After striking the Marico, to where the road leaves the Crocodile, the soil is deep and black. From the Crocodile to Shoshong is 64 miles, over an undulating country with a deep yellow sandy soil, a salt spring about 32 miles from the river, occasional pans, and two permanent waters, both of which have been obtained by digging.

At the first, 23 miles from the Crocodile, an abundant supply has been obtained by digging 3 feet through peat. At the other, which is 27 miles from Shoshong, water has been found at about 20 feet, through soft cheesy-looking soil, very like the surface-soils of the Du Toit's Pan and Bultfontein. After leaving Molopolole, acacias become less and less prominent

as one advances, although they never quite disappear. Twenty miles from Shoshong, hills are reached.

Shoshong is one mass of hills. It is just in the tropics, and has very rich soil in the basin between the hills and about the station. Here Messrs. Francis have a splendid well, 86 feet deep, on a little rise in the basin, which is about 20 or 30 feet above the surrounding country.

From Shoshong to Magalapsi River is through hills, over a deep black soil for the first 12 miles, and then over a ridge with sandy soil and granite boulders for the next 16 miles. This is a permanent water. Not many years ago this place was infested with tsetse fly, and now, since buffalo and other game have been driven out, it is so healthy that the chief Khame has made it one of his principal cattle-posts. Both Khame and Lobengula are of opinion that the fly disappears from a district when buffalo do. They are both thinking, experienced men.

From Magalapsi to Tati water is scarce, but yet not so scarce as to make travelling dangerous in any season except extreme droughts. The distance is 142 miles, through hilly country. The road follows, very nearly, the summit of the watershed between the Zambesi and the Limpopo.

Several dry sandy rivers are passed, where water can be had by digging.

From Tati River (Gold Fields) to Gubuluwayo the country undulates for 38 miles, when it becomes hilly, and the road winds through masses of small stony hills made of huge blocks of granite piled up. These hills appear to be in concentric circles, and are nearly all conical. From this to Gubuluwayo the country is hilly, well wooded, with innumerable rivulets, and very deep rich soil in the valleys.

The distance from Tati to Gubuluwayo is 129 miles. The first 38 miles mentioned above take one over an undulating country, with three permanent waters at Mapani-pan, Umkweban River, and Imbakwe River. The soil is deep and black, except near the river, where it is sandy.

The Matabeli or Amandebele country produces an abundance of rice, and all kinds of grain grow well. It is also one of the richest gold countries in the world, if reports be true. Lobengula, the chief, has promised me not to allow any one in to prospect who is not recommended by the British Government. The Portuguese had made several attempts to get concessions.

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X.—*Voyages of the Steamer 'Egeron' in the Indian Archipelago, including the Discovery of Strait Egeron, in the Tenimber, or Timor Laut Islands.*

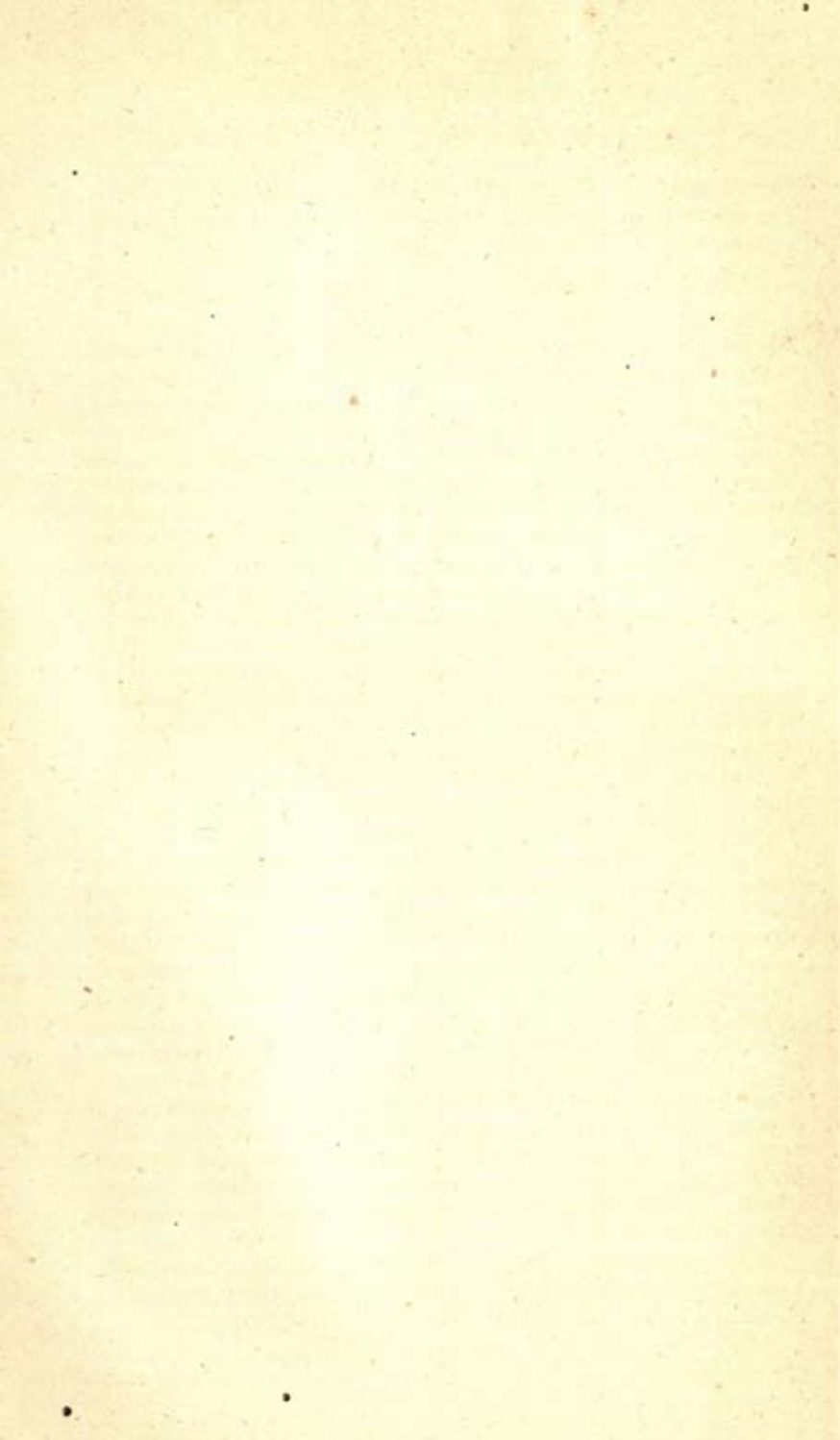
[Translated and communicated by P. BICKER CAARTEN, ESQ., F.R.G.S.,  
Hon. Corr. Mem. Netherlands Geogr. Soc.]

*The three Voyages :—Discovery of Strait Egeron.\**—In the second volume of the 'Journal of the Dutch Geographical Society,' pages 68 and 317, an account is given of the three first voyages of the steamboat *Egeron*, belonging to the Steam Navigation Company, to the eastern parts of the Indian Archipelago, undertaken with a view to open commercial relations with the sundry groups of islands in that still very imperfectly known part of the globe. It was there mentioned, at the same time, that the said Steam Navigation Company had petitioned the Netherlands Indian Government to make a grant, in order to establish regular steam navigation to New Guinea and Manilla. Though they have not succeeded to the full extent of their wishes, they have been able to make an arrangement with the Government to maintain "on a trial for two consecutive years, commencing in June 1877," a regular trade four times a year, sailing by turns from the Island Boeten, and from the Port of Ampenau to Limbok, Amboina, Banda, the Ceram Laut Islands, New Guinea, the Kei and Aru islands, the south-western islands, Timor, Ritti, Savoe, and Soembawa.

It was to be expected that these voyages would benefit, not only commerce, but science as well. Everybody who is more or less acquainted with the state of our knowledge regarding the archipelago between Timor and New Guinea knows that the islands have never been properly and regularly explored, with the exception of a part of the number which are usually called Klein Kei (*i.e.* the smaller Kei), and by the Italians "Cerruti" and "Lovera di Maria." A few points and parts of the coast have occasionally been mapped by our navigators, with more or less exactitude, but, generally speaking, our charts of these archipelagoes merit very little confidence. The very scanty and unsatisfactory data are mere fictions, supplied in order to represent the position and form of these islands, which, by further investigation, have proved to be entirely different from what was represented.

It becomes more and more evident that we have here to do with a very much broken series of islands, and that our charts

\* By Professor Dr. P. J. Veth, Hon. Corr. Mem. N.G.S.





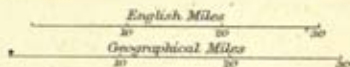
The native names according to the usual Dutch transcription  
(vowels as in Italian, but *oe* - *that's a dy - Eng<sup>h</sup>.*)

P<sup>o</sup> Palo, island

Soundings in fathoms of 6 fms

50 means that with a line of 50 fathoms no ground is reached

The Dutch flag added to the name of a village indicates that the native chief or *Urang Kaya* holds a commission from the Netherlands Government



Map of the  
TENIMBER ISLANDS  
after  
Guyots General Map of the  
Assistant Residency  
BANDA  
illustrating the recent discovery  
of  
EGERON STRAIT  
to accompany the Paper by Prof<sup>r</sup> P.J.Veth

have exaggerated the explored parts of the coast and made them appear as if belonging to islands of larger circumference. The Aru Islands prove to be smaller and more numerous than they are usually stated to be. Waigeve appears to be intersected by narrow straits, similar to those which divide the Aru Islands. Klein Kei has been discovered, by more careful investigation, to be only a group of small islands. It is now demonstrated that Timor Laut, which is put down on our charts as an island of considerable size, and the main island of the Tenimber Group, is divided by a strait. The uselessness of our maps and charts of these island-groups is therefore more and more palpable, but their real nature will remain a long time uncertain if the Government does not make up its mind to commission a qualified naval officer, and provide him with the necessary appliances for surveying the islands. The service which the Government would thus render to science will be quite evident to any one who is not a total stranger to the problems of physical geography.

Indeed, it would not be a moment too soon, if a decision is at once come to, to provide the materials for such an exploration, in order that a correct judgment may be formed regarding the hypothesis of Wallace, in his celebrated work on the origin and character of these islands of the Malay Archipelago.

The surprise of some Indian newspapers, that the *Egeron* has discovered a strait which separates into two islands Timor Laut has given a renewed proof of the incorrectness of our charts, and makes rather a strange impression on any one who has carefully studied on what information these charts of this part of the Archipelago are founded. He who has done this can but expect from every voyage which has not been confined to the usual route, or to visiting certain parts usually done by travelling officials, more or less important discoveries. He knows that these archipelagoes belong to the least-known parts of the globe of which the charts and maps have yet to be made.

The earlier published accounts of the voyages of the *Egeron* were accompanied by a map, in which the strait which divides Timor Laut was indicated, but, as the text said nothing about it, it was not clear on what authority it was laid down. We now learn that, two years ago, the Captain entered into commercial relations with the "Kampongs or villages" which are situated near the straits; but not until the end of 1877 did the *Egeron* avail itself of this strait to shorten its voyage.

It appears by this, that although a strait has been indicated before on maps, from native information, it has only now been



demonstrated by experience that, in reality, there is a channel through the centre of Timor Laut. The westerly entrance of the strait is to the south of the Island of Seirah (Gerra), whilst the easterly is found a little to the south-west of the Kampong Oliliet.

The strait is not a narrow gully, but is fully a geographical mile wide, and has some larger and smaller islands, which hide it partially from view. Its existence was until now so little suspected, that on our maps the east coasts of Timor Laut form a continuous mountain-range.

The name of Strait Egeron has been given in Netherlands India to this strait, and we hope that this name will be retained in maps, as a well-merited homage to the first discoverers. This can, however, only be expected if the exploration of the Tenimber Islands be continued and completed by the Dutch; for if this exploration be left to the Italians or other nations, it will, no doubt, be the same as with "Strait Rosenberg," which name is in vain looked for in the Italian charts of the Kei Islands.

It must not be supposed that because Strait Egeron is now discovered, Timor Laut leaves no further room for research. It is now said that the southern part appears to be divided into several islands. I have suggested long ago, and on various occasions, that it would be desirable to have the Kei, and especially the Aru Islands, properly explored. The new discovery induces me urgently to advise the same for the Tenimber group.

*New Guinea and its Commercial Products: Timor Laut.\*—*

Mr. Hartog, who originated the *Egeron* enterprise and sailed in the vessel, communicated in his report to the Chamber of Commerce at Sourabaya the following particulars relating to New Guinea:

"All the bays or creeks on the west coast which offer a safe anchoring place to small craft, as well as to larger vessels, are surpassed by Mac Cluer Gulf, which is broad, deep, and in every way superior to them. Land bordered with impenetrable high wood surrounds the inlet. The woods yield several productions, the principal of which are nutmegs. There are living along the gulf, according to Mr. Hartog, in about forty villages, 12,000 inhabitants, more or less, and on the Banda cluster about 8000. They are, so to speak, the mediators between the foreign trader and the bush Alfuras. The heat was on an average less than in Java; there prevailed a fresh

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\* By Dr. C. M. Kan; Professor of Geography, University of Amsterdam.

breezy atmosphere, and there were no complaints about violent or epidemic diseases."

Mr. Hartog describes the coast Papuans as being prosperous, all their wants being satisfied. Sago, the principal food of the Alfuras, is produced in the low countries, the highlands yielding the more valuable products. There is an abundance of both the staple food and the various exportable products. Though agriculture is scarcely known there, nature itself produces everything that is requisite for sustenance, and for obtaining the imported goods, such as weapons, strong liquors, opium, linens, gold and silver ornaments. Nutmegs are found in New Guinea in abundance, and of different kinds, including the long nut, better known in trade under the name of wild or Papuan nut. The small round nuts differ but little from the Banda nuts, and are in every case of the same good quality as the Amboina and Menado nut. And these, again, are sold at equal prices with the Banda nuts in the European markets. Mr. Hartog amused himself by opening the husks of the nuts which he had gathered in the woods, and taking the mace out of them in the Banda fashion, and drying them afterwards on board ship, intending to forward both the nuts and the mace to Europe. These samples would probably be valued at least at double the price which is usually paid for the Papuan nut, as a consequence of the splitting or the cutting of the shell, the result of gathering them in an unripe state, and through an improper preparation. Mr. Hartog considers that the establishment of merchants at MacCluer Gulf will diminish the gathering of the unripe fruit. At the same time regular navigation will cause an improvement with regard to the wasteful manner of gathering, and in this the *Egeron* hopes to make a beginning. Though Mr. Hartog estimates the trade at, say from 800,000 to 1,000,000 guilders (80,000 to 90,000*l.*), the European and native merchants of Macassar, Ceram, and Goram are afraid to establish themselves there regularly. According to him, that fear is more a consequence of tradition than of real insecurity.

New Guinea is thickly populated, agriculture is carried on, good tobacco is cultivated, and trepang, turtle, and an abundance of cattle and poultry are found. The people, according to his experience, are neither savage, cunning, nor treacherous, as most authors describe them, but rather lively and energetic, showing a great eagerness for bartering.

Timor Laut, too, has proved to be of sufficient importance to induce merchants to visit it. Mr. Hartog intends to call at this place as regularly as at the Aru Islands and New Guinea. The Kei, Papuan, and South-West Islands cannot be so favourably spoken of. The company had formerly schools, churches,



and fortifications on the South-West Islands, Moa, Letti, Roma, and Kissa. The industrious inhabitants, who enjoy a good reputation for the weaving of stuffs, especially sarongs, headcloths, and shawls, would be much pleased to see the houses of the Government rebuilt and inhabited by Government officials. Agriculture or husbandry exists only on a small scale, but the breeding of cattle is prosperous. Co-operative industry—"verzamelingsnijverheid"—applies itself to the gathering of wax, which is of a good quality.

The author concludes by stating that ignorance is one of the principal reasons why there exists no commercial relations between Java and the numerous islands of the Molucca Archipelago. "Like as at Banda, where, after the repeal of the spice monopoly, acquaintance with the place and its produce commenced by dealings between 'perkeniers'\* and traders, so will increased produce be a result of the attention devoted to these islands."

Mr. Hartog says in his report, that he has reserved much of the geographical and ethnological information he collected. But he is inclined to believe that the publication of a more detailed account would be of use, because a thorough investigation generally precedes trade.

*Second and Third Voyages.*†—After this first voyage Mr. Hartog undertook two others, in order to survey the ground still further. The result of the second voyage was the publication of a map which, in the first place, pointed out the route which the steamers would have to follow if the service should be established. On the reverse side of the map are commercial data and information. They consist of the numbers of the population, derived from official statements, but checked by Mr. Hartog on the spot, and for the greater portion found to agree; they further point out (more clearly indicated on the map) the circles or communities between whom mutual intercourse exists; thus bringing those places together where the produce and social conditions are in harmony.

But the second voyage had more important results than the publication of the aforementioned map. Mr. Hartog and Mr. Bauerman of Macassar entered into an agreement with a Chinese and a few natives to open trade in New Guinea. At Kapitoe and Skroe, both situated on the West Coast of New Guinea, small fortifications were erected, and a small quantity of merchandise placed under the protection of a Chinese, named

\* *Perkenier* is the owner of a piece of ground, which at Banda he divides into plots for the cultivation of the nutmegs.—*Translator*.

† By Dr. C. M. Kan.

Gang Engkiat, with instructions to exchange the same for native produce. They planted the Dutch colours, with the name of the steamer *Egeron* on them, in order to protect these pioneers, as Mr. Hartog called them, against the attacks of the natives. The *Egeron* party had to pledge themselves to return in three months.

This promise, and the report which was spread at Macassar that some of these pioneers had been assassinated by the Papuans and robbed of their merchandise, gave rise to the third voyage. Though this rumour could hardly be credited, it was prejudicial, as nobody would leave after that for New Guinea. The Arab merchant Saïd Saleh despatched therefore two of his countrymen to reconnoitre the country; and for this reason the *Egeron* left Sourabaya on the 15th of July, 1876, for the third time. Mr. Hartog wrote, "We found our native traders all living," and the fortifications filled with nutmegs, masooi, koelietlawan, mother-of-pearl, and turtle.

Mr. Hartog made a report of this third voyage, similar to that of the first and second, to the Trade Association at Sourabaya. His first report appeared under the title, 'Report of a Voyage in the steamer *Egeron*;' subsequently a general report of all three, under the title 'A brief Extract from the Report of the Voyages of the steamer *Egeron* to the South-Western Isles, the South-Eastern Islands, New Guinea, and the Papuan Isles, addressed to the Sourabaya Trade Club, by P. C. L. Hartog.' He rendered also an account of the three voyages to the Governor-General of Dutch India. He proposed at the same time in this report to open a regular steamship line to the South-Western and South-Eastern Islands, New Guinea, and to the Philippines.

Mr. Hartog, on his third voyage, sailed from the Aru Islands to Port Darwin, in which bay is situated the settlement Palmerston, in the northern territory of South Australia. From 500 to 600 Europeans, 300 Chinese, a few natives, and some Javanese and Malays are living there. The overland telegraph from Adelaide is laid through to Palmerston, and thence to Bangoewangie. The harbour is safe; the town is built on rocks. On their arrival, Mr. Hartog with his fellow-traveller, Mr. H. O. van der Linden, visited the Government Resident, Edward Price, Esq., who inquired if it were their intention to call regularly at Port Darwin, as the Government and inhabitants of Palmerston had wished for a long time to have communication opened between the northern territory of South Australia and the Dutch East Indian possessions. Mr. Hartog replied that this would greatly depend on the commercial prospects of the enterprise, and that the line would be



extended to Port Darwin, if a subsidy were granted. A monthly communication with Palmerston from Koepang would require 2000*l.*, and a contract for ten years. After six years this subsidy might be reduced by a third, and either party could withdraw from it. This proposal was telegraphed to Adelaide, and in the meantime the traders held a meeting to support the proposed line. The reply to this telegram was "to commence immediately, and that the money would be paid on each return to Port Darwin." The Government of South Australia thereby appeared not to wish an extended contract, but only a subsidy for each separate voyage. The opinion of the meeting was that this line, which was offered to their consideration, would greatly promote the prosperity of the Northern territory, and deserved to be supported by the South Australian Government.

Mr. Hartog's proposal to the Governor-General for the establishment of a regular steamship-line to the South-Western islands and to the Philippines is as follows:—The service will require two lines—the first to New Guinea; and the second to Manilla. The former will go from Sourabaya to Bima, where they are making a coaling station, and at which place is the junction with the Darwin line. They will remain two days there. From Bima they will go to Macassar, whence, after stopping two days, they will sail again for Ambou and Banda. From Banda the line goes to Gisser, and thence to New Guinea, viz. Sekar and Skroe of Kapauer. From New Guinea the route is to Kei Doela on the Kei groupe; after that to Dobo in the Aru Islands. The voyage will be continued *viâ* Larat, one of the Tenimber Islands, north of Timor Laut, *viâ* Lettie, a little to the east of Timor, and finally to return by way of Delly and Timor to Macassar and Sourabaya.

With the exception of Ambou, Banda, Delly, and Macassar, they will remain two days at each place, in order, "if it be considered desirable," to have political differences settled by a Government official on circuit. The voyages will be made in March, June, August, and December; two by way of Delly, and the South-West Islands, and two *viâ* Ambou and Gisser. The Manilla line runs from Sourabaya to Bima, Macassar, and Ambon, the same as the New Guinea line; but goes thence to Ternate, Gorontalo, Kema, and Manilla. The voyages to Manilla will be made only twice a year, each time after the cocoa-crop is gathered, which is the most important article of export from Amboina, Halmaheira, Gorontalo, and Menado. The return cargo to Macassar and Sourabaya direct will consist of tea, tobacco, and cigars. The cocoa culture, which is so much patronized by Government, will be greatly benefited by

this steam-line service. One voyage will be made in May, the other in October. The outward voyage from Sourabaya to Port Darwin will take place on the 1st and the 3rd, and the homeward voyage on the 15th of every month.

After going into the full details, Mr. Hartog winds up by asking for a subsidy of 8000 fl. (about 667*l.*) each voyage, or 48,000 fl. (or 4000*l.*) for six years, with a reduction of one-third for the following ten years. He supports his request by referring to the application of the Netherlands Indian Steam Company, which asks for the assistance of a subsidy "of 100,000 fl." about (8333*l.*) for five voyages for the line to Batavia, Darwin, Sydney, Melbourne, and Adelaide.

The above gives the principal facts contained in the pamphlets which Mr. Hartog has sent to the Geographical Society of the Netherlands. The Society considers that Mr. Hartog has by his voyages greatly increased our geographical and ethnological knowledge of the Dutch possessions, of which but little is known, and the Council, by a resolution passed at the meeting of the 3rd February, 1877, voted him their moral support and good-wishes for his success.

XI.—*The Old Channels of the Lower Oxus. From Russian and other Sources.* By E. DELMAR MORGAN, F.R.G.S.

THE Oxus and its channels have been the subject of a number of learned treatises dating back through many centuries; indeed, the books and pamphlets which have been written upon this subject alone, are almost sufficient to form a library in themselves, and yet no certain conclusions have been arrived at upon it. Historians and geographers, men of science, in all times and countries, have tried in vain to solve the problem; but, like the once long-sought sources of the Nile, it still eludes their grasp and defies every attempt to remove the obscurity which hangs over it, and which every succeeding age tends only to heighten.

In 1870 the Imperial Academy of Sciences at St. Petersburg published in their "*Mémoires*" Professor Lenz's able summary of the question, in which he reviews the authorities, ancient and modern, who have written on this subject, adding some considerations of his own as to the causes which produce changes in such mighty rivers. More recently in 1875, the learned editor of Tabari, M. de Goeje (Professor of Oriental Languages in Leyden University), published a work upon the same subject, but, notwithstanding the light which so erudite



an Arabic scholar has been able to throw upon it, yet so conflicting is the testimony of the different authorities, so confused are their ideas on the geography of these regions down to comparatively recent times, that it must be admitted that one and all are baffled, and that history affords no clue to the interesting question, or rather series of questions, connected with the Lower Oxus and the Aralo-Caspian basin; these must be decided by the geologist and explorer, rather than by the historian and man of letters.

It is hardly necessary to remind our readers of Peter the Great's attempts to invade the Khivan oasis, of the expeditions which he planned for that purpose, and of the death of their leader Prince Békovitch-Cherkassky, who was murdered by the Khan, it is said, on the banks of the Oguz in 1717. Although military expeditions are not always attended by scientific results of much value, there is some ground for supposing that had Békovitch returned in safety we should have possessed important data for deciding upon the exact time and causes of the diversion of the Oxus into the Aral Sea, for if reliance may be placed on the chronicle of Abulghazi Khan, a native of that country, it was about 1575, when the Oxus began its turning movement into the Aral which continued up to 1640, so that in the time of Békovitch there might still have been men living in Khiva, who if they had not themselves seen the catastrophe might have heard of it from their fathers and grandfathers. M. de Goeje, however, has shown that we cannot altogether depend on Abulghazi's statements, and that with all his good qualities he appears not to be free from pedantry and narrow-mindedness, and not only, as Humboldt says, "in happy ignorance of classical lore," but to have also dealt in the miraculous—witness his genealogy of Jinghiz Khan.

The testimony of our countryman, Anthony Jenkinson, who travelled from the Caspian Sea to Khiya in the latter half of the sixteenth century, is more important; all commentators agree in attaching credibility to him, though there is some confusion in his dates, and he appears to have referred to the mouth of the Oxus Channel in the Caspian, rather from what he had heard in Europe, than from his own personal observations, for it is clear that he was never so far south as Balkhan Bay, where the channel disembogues in the Caspian, and as Professor Lenz has shown he mistakes Aibughir for a gulf of the Caspian; but we gather from his narrative that in his time, 1558, the Oxus did not discharge into the Caspian, otherwise he would not have spoken of it as a thing of the past.

After the failure of Békovitch-Cherkasski's expedition the relations of Russia with the countries on the Lower Oxus were

for a long time interrupted, and were renewed only in 1819-20, when Mouravief was sent on a mission to Khiva. Several other journeys followed, such as those of de Berg, Abbott, Conolly, Shakspeare, and Vambéry, all of whom came upon the old river-bed, but none of them settled the question of the period and cause of deflection of the Oxus, and at that time but very few interested themselves in the matter.\*

In the summer and autumn of 1836, General Blaramberg, whilst staying with the Yomud-Turkomans, had the opportunity of exploring the ancient Oxus bed from its mouth in Balkhan Bay to the Balkhan Mountains, and from the summit of Mount Dirim-tagh he followed with his eye the direction of the old channel as it stretched away through trackless deserts to the far horizon. To commemorate his ascent he erected a pyramid of stones, and since then no European has visited the summit of this mountain, which was ascertained to be 5257 feet above sea-level by barometrical measurement.

But from the year 1870, after the occupation of Krasnovodsk on the eastern shore of the Caspian close to Balkhan Bay, the Russian authorities began to turn their attention to the steppes east of the Caspian, and the desiccated Oxus bed, called by the Turkomans "*Usboi*," i.e. low plain along which their military detachments could march with the certainty of finding supplies of water. About this time two expeditions were undertaken by Colonel Markosof, chief of the military station of Krasnovodsk, with the object of exploring the caravan routes to Khiva. In one of these, taking a north-easterly direction, he reached Dekcha Springs, a distance of 330 miles; in the second, he only went as far as Topiatan in the Oxus bed, 160 miles east of Krasnovodsk.

Colonel Stebnitsky's Expeditions in 1872 were intended to push on Markosof's work still further in the direction of Khiva, besides making a reconnaissance from Chikishliar up the Attrek Valley. A short summary of Stebnitsky's report appeared in our '*Journal*,' vol. xlv., and we will, therefore, merely mention that he found a good slope in the *Usboi* all the way to the Caspian, and every indication that a great river had once

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\* Mouravief on his way to Khiva in 1819 crossed the old bed of the Oxus at Besh-dishik Wells, 70 miles from the present river, and found it to be 700 feet wide, with steep banks, margined on the north by the chink of the *Ust Urt*, or "*sea-shore*" as he calls it. Mouravief remarks that the soil of the river-bed, wherever it is not covered with sand, is entirely distinct from that of the surrounding steppe, for trees and herbs grow in it, and wells with good water are found there. On his return journey from Khiva he crossed the old river-bed in another place, viz. at the bitter salt spring of Tunukliu, about 277 miles from Krasnovodsk, where one bank is again steep, but the channel here is not so deep as at Besh-dishik, and the bottom is covered with brushwood (see his narrative, published in Moscow in 1822, pp. 74-76).



flowed down it. Dr. G. Sievers, who was attached to his staff in the capacity of geologist and naturalist, communicated an interesting account of what he saw in a letter from Tiflis, which appeared in Petermann's *Mittheilungen* in 1873, and as this expedition has only been slightly noticed in this country, a brief sketch may not be out of place here.

Sievers started with the caravan on the 27th September from Bilek on the north coast of Balkhan Bay, having come thither by water from Krasnovodsk. After marching 27 miles they reached Kara-Shagli Spring at the north-western extremity of the Great Balkhan, and here the dryness of the air and heat were insupportable. On most days the thermometer registered 86° Fahr. at ten in the morning, and the baggage animals suffered so severely that many perished, only 400 out of a total of 1400 camels remaining alive in December. Under these circumstances progress could not be otherwise than slow. They halted at Kara-Shagli nine days to allow the rest of the caravan to come up. The water here is fairly good; road excellent, and situation in some respects fine. On the south the spring is shut in by naked heights, to the north-west rises the twin-peaked mountain Kosha-Saira to a height of 2563 feet, whence a fine view opens on the s.w. over the plateau-shaped hills of the Great Balkhan. Their route hence lay in an easterly direction past Kosha-Girli Spring at the foot of the northern slopes of the Great Balkhans. In this part of their journey the dry beds of streams issuing from the Balkhans had continually to be crossed, these, however, had made but little impression on the hard clayey soil.

On the 10th October they reached Dso-Yuruk Spring and the old Oxus bed. The first sight of the grand, well preserved ruins of a once mighty river was the culminating point of the whole expedition. Dr. Sievers thus describes it: "The old Oxus bed has an average depth of 60 to 70 feet. The steep sides are composed of regularly stratified steppe lime, whilst it often happens on the left bank that the original slopes are covered with drift sand. From the springs of Burgun the southern escarpment of the Ust-Urt plateau approaches close to the right bank, the stream here must have bored its way through horizontal layers of marl and shell-limestone belonging to the miocene formation. From Dso-Yuruk to Topiatan the bed is nearly a mile in breadth and makes several bends, whilst numerous island formations in it indicate that it once divided into many arms. Between Burgun and Igdy the bed is for the most part much narrower, and wherever the ancient river forced its way through hard stone the structure is quite simple. No valleys of tributary streams, worthy the name,

are to be seen, and we sought vainly for ruins or artificial canals, which would have enabled us to judge of the former inhabited state of its banks.

"The once sweet-water stream is now replaced by a chain of salt lakes, often of considerable length, which from a distance look like running water. Their saltiness differs in intensity; whilst in some there is no trace of crystallisation, others are completely dry, and have all the appearance of beds of snow. Near many of these lakes at the bottom of the river-bed are numerous shallow springs, and occasionally a few fresh-water lakes. Amongst the latter, mention must not be omitted of Topiatan, which is very deep, and inhabited by frogs and two kinds of fish, including a species of carp. In the neighbourhood of this lake vegetation is somewhat richer, and it is a favourite resting-place of nomadising Turkomans.

"Traces of fresh-water shells, which would for ever have set at rest all doubts that a great river had once been there, were, notwithstanding diligent search, nowhere to be found. But a glance at the old Oxus bed is enough to convince anyone that a mighty current alone could have formed in the unyielding soil a channel of such depth."

From Igdy Wells, the furthest point in an easterly direction reached by Sievers, the distance to Khiva in a direct line is 183 miles. Our readers must now follow us to the upper part of the old Oxus Channel, while we mention some of the more recent discoveries of the Russians on that side.

Immediately after the capture of Khiva in July 1873, the examination and survey of the old Oxus bed was carried on under the direction of Colonel Gluhofsky, who traced it from Kunia Urgendj to Lakes Sari-kamish, a distance of about 130 miles, reckoning its many windings. This part of the river-bed is known as the *Urun-daria* or *Kunia-daria*, both names signifying "old river." From Kunia-Urgendj, where two desiccated channels—the *Láúdan Canal* and *Kunia-daria-lyk*—connect it with the present river, its direction is nearly due west to lakes Sari-Kamish.

Its breadth varies a good deal, the average being about 1400 feet, though it is occasionally double this, and the depth in many places is 126 feet. Parts of it are covered with drift sand, and show signs of having been disturbed by the falling in of the banks. From the elevation of the right bank, it was evident that the body of the current had swept along that side. Pools of water several hundred feet long and several fathoms deep are found in the bottom, and where these are wanting, wells have been dug about three miles apart. The water in these pools and wells is sweet, until the meridian of Aibughir is reached, when



it begins to be brackish. At Dekcha springs, 16 miles from the entrance of the river-bed into Lake Sari-Kamish, the water is bad, for here it is not only salt but bitter, and quite unfit for use. The soil of the river-bed, its banks, and the surrounding country are sandy, but the atmosphere is so damp that over the whole region there is a vegetation, consisting of saksaul (*Anabasis saxaul*),\* tamarisk, brambles, and where the moisture is still greater, willows and reeds. The country on the south side is a level plain, whilst towards the north this plain abuts on Ust Urt, the escarpment or border of which is called in the local Turki language "*Chink*."

The Urun-daria terminates at the northern shore of Lake Sari-Kamish, correctly speaking two lakes connected by a canal or passage 7 miles long and one wide. The first or upper lake which receives the old river-bed is 10 miles long by  $4\frac{1}{2}$  wide; the second or lower lake is 11 miles in length by 4 in width. Both are of great depth, and their water brackish and undrinkable; although their bottom is hard, their flat shores are marshy in some places, and encrusted with salt in others; their level was evidently much higher formerly than now, for traces of the earlier shores are still visible 13 miles distant from the present water's edge.

Along the whole extent of the Urun-daria the openings of many former canals may be seen, 140 feet wide at their entrance into the old river-bed, and leading from them several smaller canals or dykes which had no doubt originally served to conduct water to the gardens and cornfields. The vast number of these irrigating works indicate the high state of cultivation and the pitch of prosperity to which the country had once attained, and this receives additional confirmation from the old ruins of towns and settlements, some of which stand on the very brink of the dry river-bed, whilst others are a little distance off, but of these more hereafter.

Gluhovsky was prevented by the marshy nature of the banks from going completely round the lower Lake of Sari-Kamish, but he learned from the inhabitants that it had an outlet on its southern shore, and he conjectured that this afterwards united

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\* This Saksaul is *Anabasis ammodendron*, described by Ledebour in '*Flora Altaica*,' 1375. The leaves of this tree, like the young shoots of the fir after frost, serve the Kirghiz cattle for food, whilst the trunk and branches are the best fuel the steppe can afford. The steamers on the Aral, Oxus, and Jaxartes are supplied with it. Owing to the remarkable closeness of the grain a log of it when once kindled and buried in ashes will retain the fire for a day and more. It sinks in water, and when hewn with the axe throws off sparks, being more easily broken than hewn through. (See Grigoriev's description of the Khanat of Khiva, &c., in *Zapiski Impl. Russ. Geogr. Soc.*, 1861, pt. 2, p. 112.)

with the Usboi, or that part of the Oxus bed of the exploration of which we have given some account above.

In 1875, however, the topographer Lupandin mapped the section between Igdy Wells and Sari-Kamish Lakes, thus completing the survey throughout its whole length from Kunia Urgendj to the Caspian. But all these surveys still failed to explain the causes of the diversion of the river, and not only did not controvert the theory accepted some time previously of an upheaval of the land having caused the Oxus to abandon its former direction and flow into the Aral; but, on the contrary, encouraged it, because it seemed the easiest solution of the question.

In the year 1876, it was proposed to establish a permanent trade route from the Khivan Oasis to Krasnovodsk, along a line drawn by Colonel Gluhofsky, who actually equipped and despatched a caravan of his own to explore it. This direction is certainly the shortest, but between Uzun-Kui Wells and Lake Sari-Kamish there are large tracts destitute of water, and it was therefore necessary to overcome this difficulty, as well as to guard the proposed new route against bands of marauding Tekke Turkomans, who had more than once plundered caravans here.\*

For the latter purpose it was suggested that a fort should be erected, and a trading factory established within Khivan territory, somewhere between Lake Sari-Kamish and the town of Kunia-Urgendj. An abundant supply of water was to have been provided by inundating the old river-bed along which the new road lies from Kunia-Urgendj to Lake Sari-Kamish, and by causing the water to run still further—to Ak-Inish (19 miles from Uzun-Kui Well). An expedition was accordingly set on foot in 1876, to take a series of levels in the ancient Oxus bed and along the Láúdan Canal, by which water is said to have once passed into the old river-way, to survey the dams and ascertain the correctness of the reports which had more than once been confirmed by former Russian missions to Khiva, that twenty years ago the Oxus had reached as far as Lake Sari-Kamish. This expedition was commanded by Colonel Petrusévitch, an artillery officer (to whose report we are much indebted in the preparation of this article), assisted by M. Helmann, an engineer, and two topographers. They left Tiflis at the end of July 1876 (o.s.), and on the 14th August marched from Krasnovodsk with a military detachment to the confines of the

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\* In 1875 a caravan was attacked and plundered by Tekke Turkomans at Kum-Sebshen Wells, midway between Krasnovodsk and Kunia-Urgendj, and another in 1877 at Balykly, within 50 miles of Kunia-Urgendj.



Khivan oasis, following the route which it was intended to utilise for caravans.

Their surveys were continued in the end of 1876, and up to the middle of November 1877, when they returned to Tiflis by way of Kazalinsk and Orenburg. At the outset of the work it appeared that, besides the execution of the task assigned to them, something might also be done towards determining the causes which made the Oxus turn into the Aral Sea, or at all events to test the theory of geological upheaval. These were their only objects, the possibility of inundating the river-bed was finally ascertained, but the question of geological upheaval was not completely set at rest, the survey having been only brought down to Lake Sari-Kamish, whereas it should have been continued to the Caspian, as it would have been had it not been for the outbreak of war with Turkey in 1877. Enough was done, however, to throw discredit on the hypothesis, which, at all events, will not apply to the section surveyed.

Levellings were taken both in a longitudinal and transverse direction, two of the former and one of the latter. A longitudinal line was run down the left bank of the Amu-daria from New Urgendj, nearly as far as Hodjeili (93 miles); down the old river-bed from its commencement at New Urgendj to Lake Sari-Kamish (240 miles); and lastly, up the Láúdan Canal, from its source in the Amu-daria to its termination in the old river-bed (40 miles). By these three lines of levellings were determined—first, the slope of the country along the old river-bed to Lake Sari-Kamish; second, the fall of the Amu-daria itself; and lastly, the incline between the old and present channels of the river along the line of the Láúdan Canal uniting the two. Another longitudinal line of levellings was run up the canals; Manghit-Arna, from its source in the Amu-daria to its termination in Láúdan Canal (40 miles), Soobet Yargan (20 miles), and Shamrat (40 miles). The first two of these enter the triangle formed by the old and present channels of the river with Láúdan Canal, so that a complete representation of the contour throughout this triangle has been obtained. The Shamrat Canal runs south-west from the old river-bed, and finally separates into numerous branches between the heights of Man-ghir and Tuz-ghir, so that by this line of levellings the slope of the country to the south-west of the old river-bed has been ascertained.

Intercourse with the inhabitants during the progress of the work in the Khivan oasis led to the information that there were two other desiccated river-beds to the south of the old channel, one of these bearing the name of Déúdan, whilst the other (of which very little is known) is the Tonu or Sonu-daria. Thus

there are without doubt three old river-beds in the Khiyan oasis. The first of these, the best known and nearest to the actual river, is called the Daria-lyk or Kunia-daria. It begins west of the town of Urgendj, and passes the towns of Kok-chegeh, Klytch-Niaz-bai, and Kunia-Urgendj, continuing to Lake Sari-Kamish. The second, the Déúdan, also called Daria-lyk (we shall continue to call it only by its former name), begins near the towns of Hanki and Hazar-asp, and passes by Kosh-Kapiur, Ambar-Manaf, Tash-aus, and Ilialli to Mount Manghir, and then to Lake Tunukli; but before reaching this lake it bifurcates, one arm taking a more easterly direction,\* whilst the other enters Lake Tunukli, and passing out of it continues towards Sari-Kamish. The third channel, called Tonu or Sonu-daria, takes its rise near the town of Hazar-asp, and, passing close to the town of Khiva on its southern side, pursues its course in the direction of Mounts Bishik-ghir, and Tuz-ghir, and beyond these towards the Wells of Adji-Kui.† This last-named channel forms the southern boundary of the Khiyan oasis from Hazar-asp to Mount Bishik-ghir, for immediately to the south of it lies the desert of high sand-hills, at one time covered with saksaul, but now bare, the trees having been cut down and taken to Khiva for fuel.

These three channels are of considerable importance in determining the causes of the deflection of the Amu-daria from its ancient bed, for supposing a geological upheaval to have actually occurred as some think, the country about Bishik-ghir should doubtless have been higher than the banks of the Daria-lyk, and more especially than those of the actual river. Accordingly a line of levellings was run from Daria-lyk (the first of the old river-beds), at the bridge of Kok-chegeh in a transverse direction, across the second channel Déúdan to Bishik-ghir. In this way the region adjacent to the Amu-daria has been surveyed in various directions along past and present river-beds, and when investigations have been completed, it is probable that certain conclusions may be arrived at, based on well-ascertained facts and accurate observations.

The levellings gave a fall of  $2\frac{3}{4}$  inches per mile in the present course of the Amu-daria between New Urgendj and Hodjeili;  $3\frac{1}{4}$  inches per mile in the old river-bed Daria-lyk from its commencement at the Amu-daria, near the town of New Urgendj to its junction with Láúdan Canal (13 miles above Kunia Urgendj); and lastly, about 5 inches per mile in the Láúdan

\* The further course of this easterly branch was not examined.

† The further direction of this channel beyond Adji-Kui is unknown.



canal between the point of its departure from the Amu-daria and its junction with the old river-bed. The incline therefore along the old river-bed is considerably steeper than in the direction taken by the Amu-daria after its deflection from the Daria-lyk. The levelling from Kok-chegeh to Mount Bishik-ghir showed a very slight fall, the channel of Daria-lyk at Kok-chegeh being altogether only 5 feet 10 inches higher than the river-bed at Mount Bishik-ghir. It must, however, be remembered that the latter is constantly being silted up with sand-drift, whilst the water in the Daria-lyk keeps the channel clear. Lastly, the levelling along the Shamrat Canal was, strictly speaking, unnecessary, it being evident that there was a fall, for otherwise it could not have served for purposes of irrigation so recently as from six to eight years ago. With regard to the incline along the Daria-lyk from its junction with Láúdan to Lake Sari-Kamish, although the figures have not yet been worked out, the incline is probably greater than up the Láúdan to the present river, because this part of the channel is deeper and better defined, and about 20 miles before Lake Sari-Kamish is reached, has the appearance of a fissure with steep banks of clay obstinately resisting atmospheric influences. The depth of the old river-bed at Dekcha, 17 miles from Lake Sari-Kamish, is at least 210 feet, and its width from 700 to 1050 feet.\* Even at the mouth of the Láúdan the level of the old river-bed is below the Aral. According to a levelling made in 1875 by Colonel (now Major-General) Stoliétoff's expedition, the right bank of the Amu-daria at Fort Nukus, opposite the town of Hodjeili, is 28 feet above the level of the Aral Sea, whereas according to levellings made in 1876 and 1877 the bank of the Amu-daria at Hodjeili (*i.e.* the same as Fort Nukus) lies 35 feet 4 inches above the old river-bed at the mouth of the Láúdan canal. Yet the river left its old channel with a greater fall and turned to the right to discharge into the Aral Sea. All these figures, obtained by accurate measurements, prove that the change in the course of the Amu-daria followed the same laws which have influenced all other

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\* M. Helmann, the engineer officer referred to above, visited the Oxus bed last winter to report on the recent overflow. He describes the Dekcha locality as a series of waterfalls continuing for about a quarter of a mile, the banks rising on both sides to a height of 210 feet. Beyond this the current again pursues its course to Sari-Kamish Wells (5 miles from the lake), where there is another small waterfall. He further adds that, notwithstanding the great influx that has come from the Oxus, the water in the Upper Lake is almost as brackish as before, and that, although its level had risen considerably, it must rise a good deal more before it can enter the Usboi, and so find its way down to the Caspian.—[M.]

ivers, and that it is unnecessary to have recourse to the hypothesis of a geological upheaval, or any other disturbance of the earth's surface in order to explain it.\*

Throughout 530 miles of its course the Amu-daria is already known, and has of late been explored from Charjui in the Khanat of Bokhara to the Aral. For three-fourths of this distance the river keeps to one channel, forming numerous islands and shallows, in the remaining fourth it divides into several arms, and forms a large delta, the apex of which is situated at Fort Nukus. For 87 miles below Charjui as far as Fort Kabakla (also in the Khanat of Bokhara), the Amu flows through low clay hills, approaching close to the right bank of the river, and occasionally descending abruptly to the water's edge. On the left bank no hills are visible, this is occupied by continuous settlements as far as Kabakla, and here the ground on the left bank first begins to rise, near the river. From Charjui to Kabakla, the right bank has a desert-like appearance, whilst the whole of the left bank is inhabited, irrigated, and covered with verdure; there are a few settlements,† too, on the right bank, but they are of no importance, and are, moreover, separated by uncultivated tracts fit for nothing and covered with sands. The population on the left bank, however, is dense; thus in Charjui alone, with its neighbouring homesteads, there are 6000 houses, and the same number in Denan the next settlement, though the belt of fertile land extends no further than twenty miles into the steppe, and therefore this numerous population is entirely supported by the fertility imparted to the soil by irrigation. On the right bank sands again appear as the enemy of the agriculturist and settler, piled up in gigantic hillocks on the very margin of the river. Formerly there were in some places valleys hidden in the windings of the rocky shore, well suited for cultivation, but the sands buried them, and obliged the inhabitants to abandon their homes and remove to the left bank.

From Fort Kabakla, where a Bokharian garrison is stationed

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\* Colonel Stebnitzky, to whom we have referred above, and who studied the subject from the Caspian side, says that in its lower course, *i.e.* between the Great and Little Balkhans, the Usboi preserves the characteristic features of a river-bed, here and there somewhat effaced by time, and that levellings as well as barometrical observations show a decided slope to the Caspian and *not* in an opposite direction. But Stebnitzky cannot altogether dismiss the doubts he seems to entertain of its having possibly been the last connecting link between two seas (Aral and Caspian), and not a river-bed at all. And apart from historical evidence the only shells he found there belong to the same marine kinds now existing in the Caspian, viz. *Didacna* (*Cardium*) *trigonoides*, Pall. subfossile, *Cardium edule*, Lin.—[M.]

† Betik, Kharadj, Hodja-Kenepse, Osti, and others.



as a defence against the inroads of the Tekke Turkomans of Merv,\* the Amu-daria flows as far as Toyu-Boyin † for 160 miles, between rocky limestone elevations entirely uninhabited. The hills are covered with sands piled up in ridges and continuing for vast distances. On the north they merge in the sandy desert of Kizil-Kum, whilst on the south they extend to the oasis of Merv. It is reported that for about 10 miles from the river the sands on either side are overgrown with large forests of saksaul; near the river, however, nothing grows but stunted bushes, everything else having been cut down and carried in kayuks (caiques) to Khiva. Here and there along the banks are spits of low-lying land, so called "tugais," fit for cultivation, but they are very small, and are only formed at the bends of the elevations margining the river. Ruins of old fortresses, however, are of frequent occurrence between Kabakla and Toyu-Boyin; thus, on the right bank are Nar-Kyz, Kyz-Kala, Djegit-Kala, Sertarash, Utch-Utchak, and Meshekli, on the left bank, Dayah-Hatun, Dargan-Baba, Kosha-Kala, Eshek-Robat, Ak-Robat, Senduver, and others. The importance of these ancient remains was to guard commercial intercourse and protect the frontiers of Khiva from marauding bands; some were constructed as fortresses of considerable strength; others again were merely fortified caravanserais to afford shelter to passing caravans during their midday and night halts. To the former category belong the ruins of Dargan-Baba and fortress of Kyz-Kala, standing on a hill 2 miles from the river and supplied with water from it by a subterranean aqueduct. The traces of this aqueduct and of a well in the fortress in connection with it are still visible. Even the woodwork may be seen to the present day, and the well itself, being built of baked bricks, is

\* The Turkomanian town of Merv lost its political significance in 1795, when Amir Murad of Bokhara, not content with the submission of the town, carried off the greater number of its inhabitants (40,000) to Bokhara, where their descendants live to the present day in a separate quarter. They taught the Bokharians the silk industry, which the latter did not know before. In the time of Haider, son of Murad, known under his name of Send-Khan "the clean," Merv was occupied by the Khivans under Muhammed Rahim in 1815. It again, however, fell into the hands of Bokhara in Nazr-ullah's reign, but was soon afterwards taken by the Khivans in order to be transferred to the Turkomans, who have held it ever since, and make use of it as a base for their forays into Persia. There are not more than 2000 settled inhabitants of Uzbeg race in the town, which is surrounded by nomad encampments of Sariks and Salors in continuous succession along the course of the Murghab. See Kostenko's 'Central Asia,' &c., pp. 21-22.—[M.]

† Toyu-Boyin is 190 miles by the river from Hodjeili. The rocks here are compact limestone filled with small shells. The gap is so narrow, and the rush of waters so great, that it is doubtful if a steamer could steam up this reach of the Oxus (Wood's Notes on the Lower Amu-daria, &c., Journal R. G. S., vol. xlv., p. 385).—[M.]

admirably preserved. All the other ruins are nothing more than traces of caravanserais.\* Beyond Toyu-Boyin (camel's neck), where the Oxus bursts through two rocks that project like teeth, and that leave a passage but 1100 feet wide for the river, the elevations on the right bank recede completely to one side, whilst on the left bank they continue 7 miles further, nearly to the town of Hazarasp, and here they too terminate, and the celebrated Khivan oasis begins. On the right bank the oasis is only from 7 to 10 miles wide, and continues the same width almost to Fort Nukus, *i.e.* to the beginning of the delta. But on the left bank, the land free from sands widens out until opposite Mount Bishik-ghir it has a width of nearly 40 miles. Beyond Kunia-Urgendj and Fort Nukus agriculture could be carried out on a great scale, were it not, first, for the floods which submerge the whole delta, and secondly the want of hands. The soil of the Khivan oasis is *Loess*,† capable of producing rich crops when irrigated, for the country is entirely rainless, and life is dependent on the artificial supply of water. There are but few kinds of corn and plants requiring only three or four times watering, for most of them can only be grown on land flooded ten or fifteen times, and saturated with moisture, and some require watering all the time they are growing. It is for this reason that the Khivan oasis, notwithstanding its insignificant size, contains so much vacant land. The most populous districts are near the town of Khiva, and between it and New Urgendj, Hanki, Klytch-Niaz-bai, and Tash-aus. Further westward the population is less dense, and is restricted to the banks of the Amu-daria and the Daria-lyk, with the canal of Klytch-Niaz-bai

\* Legends are extant relating to the fortresses and ruins seen along the banks of the river between Toyu-Boyin and fort Kabakla, but they are unreliable, apart from their supernatural character, similar legends being met with in entirely different places.

† *Loess* (*Löss*) belongs to the newer geological formations, *viz.* to the diluvial, or, as called by Lyell, the pleistocene beds. It has been quite recently shown that *Loess* is not only met with in some of the valleys of Central Europe (the Rhine and the Danube), but in different parts of the old world as well. *Loess* is marl containing from 22 per cent. to 42 per cent. of substances (mostly carbonate of lime) soluble in acids, and soon disintegrates in water and falls to powder. It is found unstratified. As only land mollusca (fresh-water as an exception), and also bones of mammalia have been found in the typical *Loess*, its presence is accounted for by the deposit of mud during floods. The most characteristic shells found in it are the following: *Succinea oblonga*, *Pupa muscorum*, *Helix hispida*. *Loess* is exceedingly fertile.

[The preceding note is by Mr. G. T. Sievers, but he barely alludes to the extraordinary disclosures of Baron Richthofen as to the immense development of *loess* over the surface, often of both hill and plain, in Northern China, and the admirable chain of reasoning by which he has supported, we might say demonstrated, his theory of the sub-aerial or atmospheric deposition of the *loess*. The same great work ("China") contains most interesting remarks on the physical history of the Aralo-Caspian basin, especially in its relation to human settlement.]



running near it. And between these two water arteries lies desert stretching far away almost to the Aral Sea. Kunia-Urgendj is the southernmost limit of the inhabited districts as Kungrad is the north-westernmost, the latter being separated from Hodjeili by nearly 70 miles of uninhabited country, the resort of wandering Kirghiz subject to the Khan. The Orenburg Kirghiz, too, come hither from the Emba River to winter with their flocks and herds.

The oasis is bordered by sands: on the north are those of Kizil-Kum, extending to the Syr-daria itself, and on the south lie the deserts which fill in the whole region to the confines of Merv and oasis of Akhal-Tekke. Of trees in the eastern part of the oasis there are none, but on the west along the former Láúdan Canal, and between it and the Siuelli Canal the country is thickly covered with tamarisk bushes and wild olive, mingled with cane-brake, forming so thick a jungle as to be impenetrable for either pedestrian or rider. Here are the haunts of the tiger, wild boar, wolves, jackals, wild cats, and a small animal, the *Karagulak*, hitherto unknown to zoology, and always accompanying the tiger, of whose near presence it gives warning by a peculiar barking.

Beyond Kunia-Urgendj on the west, for about 20 miles further, are the habitations of a half-nomad people, the Turkoman-Yomuds, who derive their supplies of water from the Kush-begi Canal, and this in its turn is fed by the Khan-ab Canal, communicating with the Amu-daria by the Siuelli Canal. Further west again lies a continuous clayey plain, overgrown with saksaul, and bearing traces of former cultivation as far as Lakes Sari-Kamish. This plain is bounded on the north by the Ust-Urt, and on the south by the hills of Chagilli-Kirish, Kala-li-ghir, and Tuz-ghir, so that it is nearly 53 miles wide. Through it pass all the ancient river-beds above named and Shamrat Canal once, in the time of Medehmi-Khan, between 1840-1850, supporting a considerable population. On this plain are to be seen the ruins of large towns: Déú-Kesken, Diabekir, Ismukshir, Déúdan-Kala, Kalali-Ghir, Ak-Chegeüi, Tarpak-Kala, Ak-Kala, and many others whose names even are forgotten, and of which only insignificant traces remain. Here, too, on this plain numerous coins are found—Persian, Mongolian, some too with Cufic inscriptions, proving that this was the ancient kingdom of *Khwarizm*, the capital of which, destroyed by Jinghiz-Khan, occupied the site of the modern Kunia-Urgendj.\* The whole plain is free from sand, and might support

\* [These ruins were examined by Colonel Gluhofsky in 1873. He found that those of Kunia Urgendj and Déú Kesken were the most important. The former,

a large population if water were led into canals, or into one of the old channels running through it, so as to restore life to it once more. Such a renovation actually took place thirty-five years ago, water in large quantities burst into the Láúdan Canal, filled the Daria-lyk, and actually reached Lake Sari-Kamish. This was not the work of a single season, but of several consecutive years. At that time Kara-Kalpaks lived along the banks of the Láúdan (they have now removed to the Delta). Fifty years ago Láúdan was a very unimportant irrigating canal, and the Amu-daria had an entirely different course to that which it now has. Owing to the change produced by its making a new elbow at this point, the stream began to strike more and more into Láúdan, enlarging it by degrees until it became a considerable channel. The water overflowing the Láúdan inundated the whole country between Kunia-Urgendj and Hodjeili, and finally entered Aibughir Gulf. But it afterwards made another channel for itself into Daria-lyk, and filled Lake Sari-Kamish, then almost dry. Seeing such a quantity of water, the Turkoman Egen-Klytch exactly thirty-five years ago, *i.e.* in 1843, built a dam across the Daria-lyk, and this still bears his name. Though it soon burst, first one, and when this too gave way a second was built in place of it, and the last of the three exists to the present day under the name of Egen-Klytch-Bent, *i.e.* Dam of Egen-Klytch. The water checked here went to irrigate the adjacent land, but the slope was so great that it found its way round the dam, and at length poured southwards into the second old channel Déúdan, past Bastir-Mollah-Avliah to Lake Tunuklu, filled it, and poured along the ancient channel ever in the direction of lakes Sari-Kamish. The outflow from Tunuklu was closed by a dam (afterwards destroyed by the water), and all the land on either side of Daria-lyk and Déúdan began to be occupied. In

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as mentioned in the text, was once the capital of Khwarizm and the emporium for the trade between Europe and Asia. It was destroyed by Timour Leng, or "the Lame," in 1388, and although subsequently rebuilt never attained its former prosperity. In 1603, Kunia Urgendj was sacked by Cossacks of the Ural under their chief Nitshai. About the end of the 17th century it was again destroyed by the Kalmuk Khan Aëomka. Among the ruins is a lofty tower well preserved. This probably served as a minaret, and is shaped like a conical ball, 200 feet high and 35 feet in diameter at the base. It is built of burnt bricks, and has four convex rings with inscriptions in some unknown language. The letters of these inscriptions are bigger than a full-grown man. A winding stone staircase in the interior leads to the roof. At present the tower is the resort of numberless pigeons and bats. Not less interesting in point of architecture are the ruins of Déú-kesken, on a slope of the Ust-Urt, with their bold arches, domes, &c., and general massive character. The bricks used in the construction of the buildings are all of uniform shape, about a foot square. They are made with great care, and are extremely durable, giving off a metallic sound when struck (*Mittheilungen*, 1874, p. 25; *Geogr. Mag.* 1874, p. 78).—M.]



the meantime the Shamrat Canal was full of water, and its overflow also entering the old Déúdan Channel near Momin-Uyu, contributed still further to fertilize the adjacent lands. Hereupon, an enormous canal, the Sopai-ab, so-called from the circumstance that the lands it irrigated were divided by Khan-Medehmi among his officials or "sopais," was excavated. But on the death of Medehmi-Khan, killed at Merv, which he went to subdue, all the works he had undertaken began to fall into ruins, and his successors, unable to subdue the Turkomans by armed force, had recourse to cutting off their supplies of water and to inundations. In this way Said Mahommed (father of the present Khan) twenty-three years ago closed the mouths of the Láúdan and Manghit Arna Canals with dams, the former entirely, and the second so much as to allow only enough water for the supply of the town of Manghit. In consequence of this the lakes on either side of Láúdan were dried up, the inhabitants of Kunia-Urgendj exterminated, and the whole length of the Daria-lyk from Kok-Chegeh downwards depopulated, the town of Kok-Chegeh itself had to be removed to another site, and the extreme Úzbek settlement became the town of Klytch-Niaz-bai. The canals: Shamrat, Sopai-ab, Mekhter-Yargan, Khan-ab and others were destroyed, and Aibughir Gulf desiccated. Owing to the want of water the Yomud Turkomans, Hoklens and others were obliged to submit, whilst the Choudars, who had hitherto been on the Khan's side, were disposed to rebel. The Choudars lived, as they still do, between the Amu-daria and Klytch-Niaz-bai Canal, and to cut off their water supply would be a difficult matter. To effect this it would be necessary to deprive the Uzbek population in the towns of Manghit,\* Gurlen, Kitai, and Klytch-Niaz-bai of water. The locality they occupy lies low, and this circumstance gave their enemies the opportunity of flooding their land after seed-time from several sides at once, and thus ruining their crops, obliging them to seek refuge in flight, and submit when they found resistance useless.

By such measures as these Said Mahommed Khan subdued the Turkomans, but never thought of repairing the former irrigating works: on the contrary, he communicated to his son his unwillingness to renovate those constructed by Me-

\* This is the name of the ruling tribe at Bokhara. The Manghits are divided into two parts. One of them lives in the Khivan oasis on the left bank of the Oxus, giving their name to a district and to the town mentioned in the text; the other is settled in and around Karshi, in the khanat of Bokhara. Vambéry says that the original home of the Manghits was in N.E. Mongolia, whence they followed Jinghiz-Khan to the Oxus near Khiva, afterwards settling in the khanat of Bokhara on the steppe near Karshi (Vambéry's 'Hist. of Bokhara,' p. 346 note).—[M.]

dehmi Khan. Accordingly, the present Khan only restored the town of Kok-chegeh, and conducted water to Kunia-Urgendj (which rose to fresh importance nine years ago) by a new canal leading to that of Siuielli and Láúdan, while its surplus water supplied the small encampments of Yomuds to the west of Kunia-Urgendj between Daria-lyk and the cliffs of Ust-Urt.

The water of the Oxus is always muddy,\* summer and winter, and even when frozen. Ice, however, rarely remains on it for more than a month together. The quantity of sediment it contains is very great, a fact of such importance that it deserves further study, though much attention was bestowed upon it during the years 1876-77. At flood-time, which happens twice a year, in May and July, this sediment is enormously increased, owing to the violence of the current and the soft, friable nature of the banks under aqueous action.†

The Oxus sometimes rises 14 feet above low-level, and of course whenever precautions have not been taken, and even where continuous embankments 7 feet high and upwards have been thrown up, the force of the current is so great as to burst through the banks and flood the neighbouring land, depositing on it the earthy matter brought down. Now, however, that the embankments are well looked after irruptions are of rare occurrence, and the whole mass of deposits is carried into the Aral Sea, silting it up more and more.‡ This phenomenon has

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\* Then with a heavy groan Rustum bewailed—

‘Oh, that its waves were flowing over me;

Oh, that I saw its grains of yellow silt

Roll tumbling in the current o’er my head!’”

*Sohrab and Rustum.*

† A valuable article has been published by the Imperial Academy of Sciences of St. Petersburg, entitled ‘Wassermenge und Suspensionsschlamm des Amu-Daria,’ &c., by Professor Carl Schmidt and F. Dohrandt, the latter of whom has, alas! been removed by death before the results of his investigations have been published. In this article it is stated that the water of the Oxus in summer is of a yellowish-brown colour and very thick. In places where there is no current the fine particles of suspended earthy matter sink in the course of twenty-four hours, leaving behind a perfectly clear soft water, pleasant to the taste. During the winter months, when the volume of the stream is considerably diminished, and the banks are prevented by an icy coating from crumbling away, the water drawn from the river still continues muddy.

The mud held in suspension by the Oxus forms a true *normal soil*, it carries with it all that is necessary for the highest cultivation, and may in this respect be compared with that of the Nile.

It appears, too, that although the volume of the Mississippi as compared with that of the Oxus during flood time of both rivers is as 9 to 1, yet the quantity of mud held in suspension by a cubic metre of the latter is four times greater than by that of the Mississippi.—[M.]

‡ Colonel Baron von Kaulbars, in a paper read before the Impl. Geogr. Soc. on the 11th February, 1879, explains the deviation of the Oxus in the following way. When the stream meets with a level horizontal surface the water overflows, and in



not yet received due attention, yet it may alter in an important degree the views entertained as to the cause of the deflection of the river, especially if considered in relation to the volume of water and velocity of current, attaining in the narrows of Toyu-Boyin 11 feet per second; and in many places, *e.g.* at Charjui and Shabas-Vali ferries, and near Nukus, more than 6 feet per second at minimum water-mark. The strength of current, however, is only of great importance as far as it concerns the question of navigability; it is on the volume of water that must depend the feasibility of diverting part of the river into its ancient channel and flooding it, if not as far as the Caspian, at all events to lakes Sari-Kamish. According to observations the Amu-daria bears past Fort Nukus, *i.e.* below all the irrigating works, and therefore expending itself to no purpose in the delta, upwards of 34,300 cubic feet per second at low water, and not less than 68,600 cubic feet at high water. We have already seen that between Charjui and Fort Kabakla all the land fit for agriculture is under cultivation, and that between the latter of these places and the town of Hazar-asf, there is no room for a settled population. In the Khivan oasis the fertile land is limited to a narrow strip along the right bank, and the whole of it is irrigated and under cultivation; whilst on the opposite side most of the vacant lands lie below the beginning of the delta, *i.e.* to the west of a line drawn through Kunia-Urgendj, Hodjeili, and Fort Nukus. No serious additional expenditure of water can therefore be required for irrigating purposes, even supposing that the whole oasis were watered and cultivated, and it is only here that new irrigation works could be constructed. Moreover, many of the dykes and canals carry so much water that a great deal is wasted, and in this way lakes are formed in the old river-beds of Tonu-daria

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such places there is hardly any current. Reeds then make their appearance, and act as a filter. The earthy matter held in suspension drops to the bottom, shrubs begin to grow, and with their roots harden the soil to such an extent as to resist the flow of the water, and oblige the stream to seek another outlet through soft soil. In this way the river soon erodes a new bed. During the present century the main channel of the Lower Oxus has moved gradually from west to east, those arms formerly navigable are now shallow or entirely dried up. Major Wood in his article (Notes on the Amu Daria, p. 379) has drawn attention to the influence of irrigation works in diverting the main stream, but as these are for the most part dug to the west of the river, whereas the tendency of the latter has been eastward, they cannot have had such influence as Major Wood seems to think, however much they may have indirectly caused such changes by greatly reducing the volume of water and proportionately the power of the stream to overcome impediments formed in its course. Baron Kaulbars is of opinion that by applying all those lessons taught us by an attentive study of the past changes in the Oxus, and by taking advantage of such an event as the recent escape of the river into its old bed, the proposal to establish a navigable waterway to the Caspian from the heart of Central Asia will not be found impossible, and it is unnecessary that we should dwell on its importance here.—[M.]

and Déúdan; and it may be confidently asserted that by regulating the outflow from the Amu-daria, even supposing the whole Khivan oasis to be occupied and cultivated, the expenditure of water would be rather diminished than increased, and the quantity flowing past Nukus would be the same as at present, viz. 34,300 cubic feet at low, and 68,600 cubic feet at high-level. The quantity of water required to inundate the old channel as far as lakes Sari-Kamish would not be very great. Láúdan Canal in former times was about 200 feet wide, with a mean depth of not more than 7 feet at low-water, and a velocity of current of 3 to 4 feet per second. Its volume was therefore equal to 5145 cubic feet per second. But the greater part of this, say two-thirds, overflowed between the towns of Hodjeili and Kunia-Urgendj, discharging into Aibughir Gulf, and only the smaller one-third part, or 1715 cubic feet per second reached the old river-bed, and, by this channel, lakes Sari-Kamish. Assuming the latter quantity (*i.e.* 1715 cubic feet) as amply sufficient, judging from past experiences, to flood the old channel, we may be quite certain that the Amu-daria will lose none of its qualities by a diversion of  $\frac{1}{30}$  (and in summer  $\frac{1}{40}$ ) of its entire volume, yet even this quantity would amply suffice to restore life to the whole country to the south and south-west of Kunia-Urgendj, which became dried up when the river left its old bed and turned towards the Aral Sea, and the cost of this would not be particularly heavy. It is merely a question of earthworks. The head of Láúdan must be reopened, or, better still, Siuelli Canal may be utilised by letting water pass through it into the Láúdan, and digging another canal somewhat lower down to supply the town of Hodjeili.\* In this brief sketch it is unnecessary to examine the grounds for preferring Láúdan and Siuelli Canals as means of inundating the old river-bed, suffice it to say that this mode of proceeding will involve less labour, and, what is of the greatest importance, the desired results will infallibly be brought about without any fear of a subsequent deflection of the river cutting off the supply of water, as might happen were the canal to be made in another place. In fact investigations hitherto made (and of these a detailed report will appear in the course of time as soon as all the data have been worked out) demonstrate beyond all doubt that there are no obstacles to the admission of water into the old channel, Daria-lyk, from the present river as far as

\* The Láúdan Canal was closed about the year 1857, and Admiral Butakoff saw in 1859 a great extent of country inundated, probably owing to the closing of this canal, which in his earlier visit to the Delta in 1848 was one of the discharging arms of the Oxus.—[M.]



lakes Sari-Kamish; and doubts of the water flowing in this direction must be dismissed, together with fears that the diminution of so much water will interfere with the navigability of the river. The only opposition to it can come from the Khan of Khiya, who may fear lest the Turkomans should become insubordinate when they are relieved of all apprehensions of losing their supply of water. But these considerations are scarcely worth mentioning now that circumstances are so changed.

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