

GOVERNMENT OF INDIA

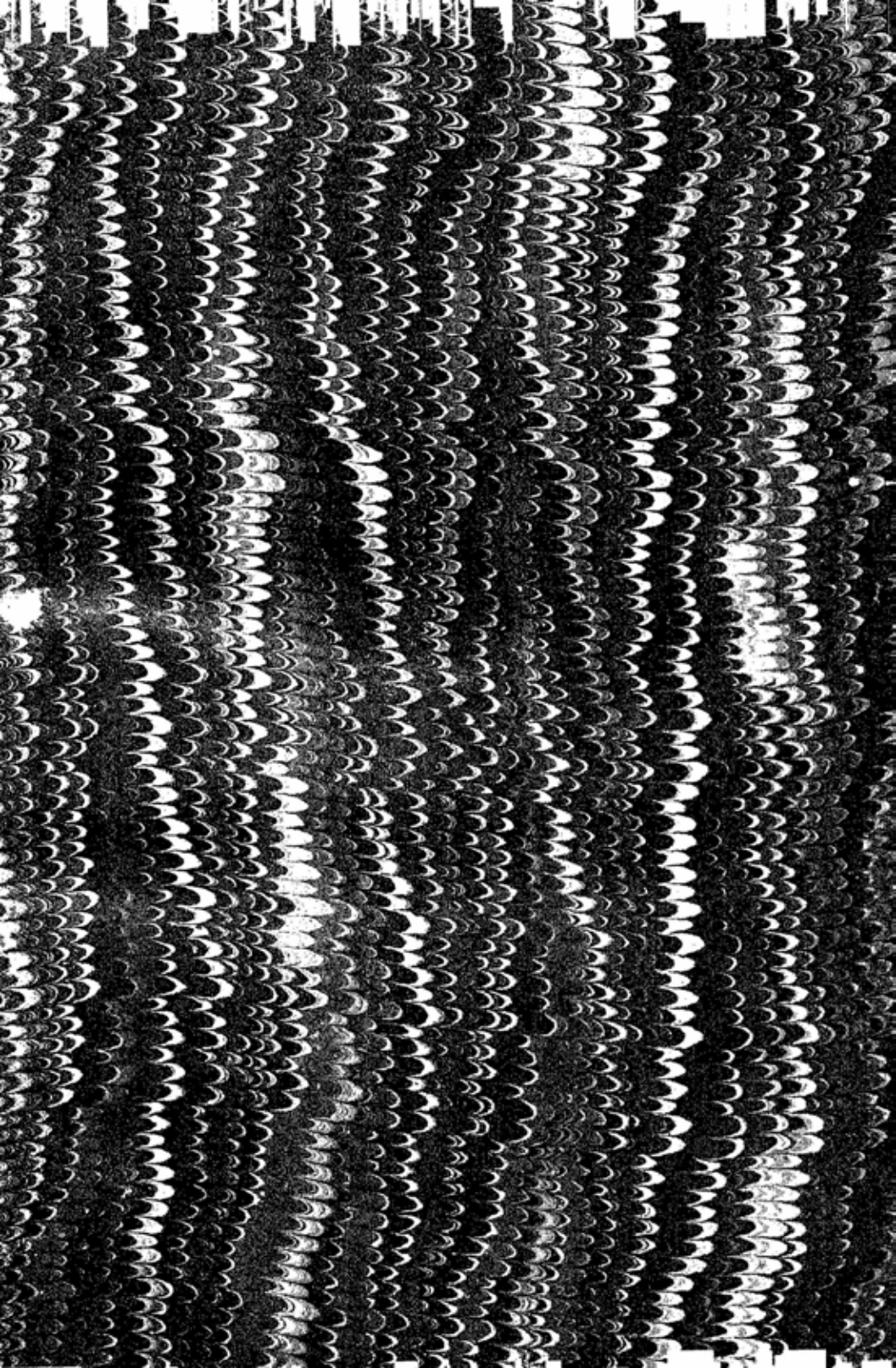
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PROCEEDINGS
OF THE
ASIATIC SOCIETY OF BENGAL.

EDITED BY

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JANUARY TO DECEMBER,

1881.

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CALCUTTA:

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1881.

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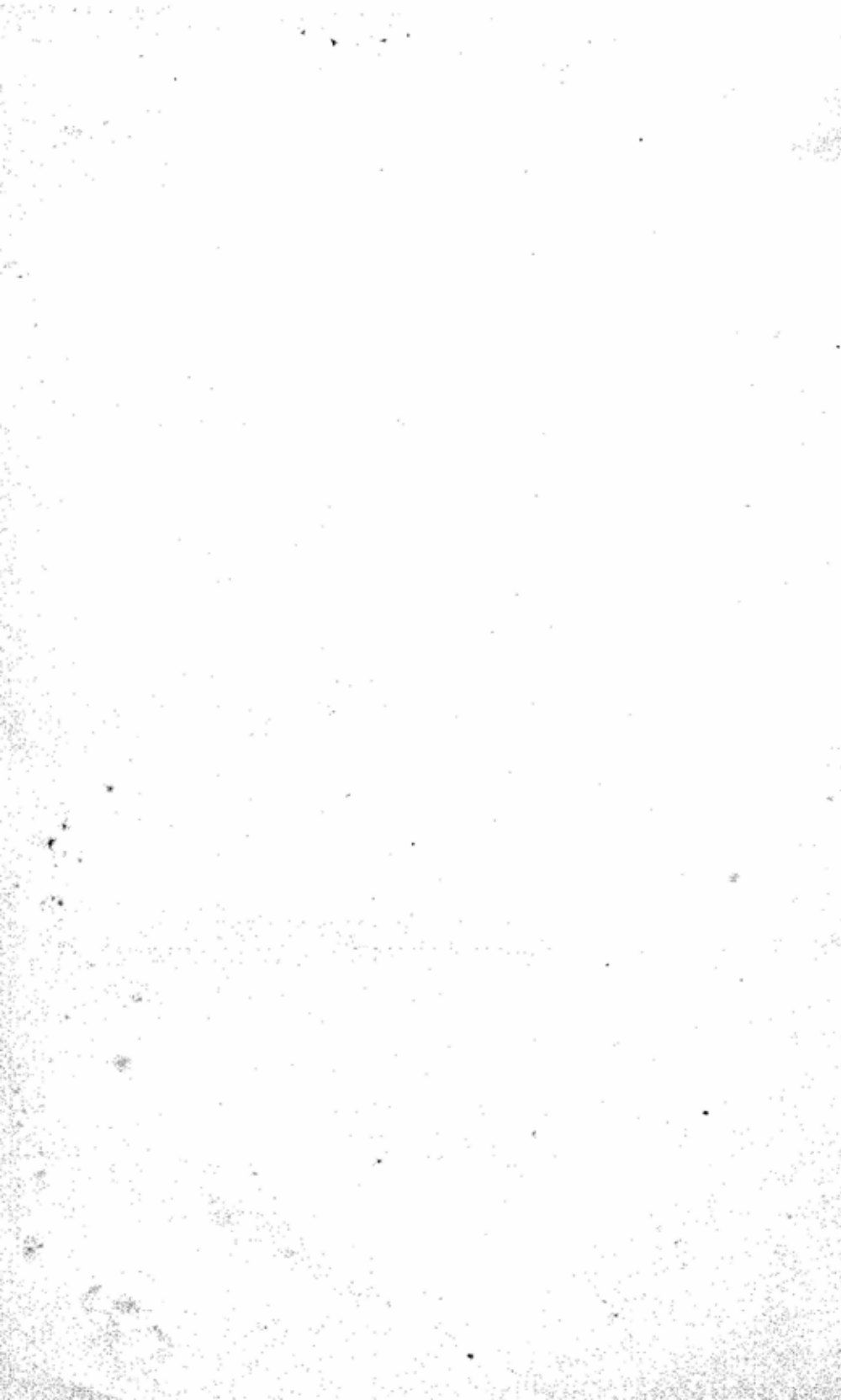
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- I. Trace of Van Rysselberghe and Schubart's Meteorograph (p. 65).
 - II. Facsimile of the last page of a MS. of the Bhatti-Kāvya, dated Saka
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 - III. Tracing from Sun Negative taken at Dehra observatory, G. T. Survey
of India (p. 153).
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Errata in the Proceedings for April.

Page 64, line 2 from foot, after "available" insert full stop.

„ 64, „ 2 from foot, for "and the work will be edited with Mádhava's commentary", read "The work will be an edition of Parásara's lawbook with Mádhava's commentary".

„ 65, line 6, for "Fezazdaq" read "Ferazdaq".

„ 66, „ 3, for "Schubert" read "Schubart".



[APPENDIX.]

LIST OF MEMBERS
OF THE
ASIATIC SOCIETY OF BENGAL.
ON THE 31ST DECEMBER, 1880.

LIST OF ORDINARY MEMBERS.

R. = Resident. N. R. = Non-Resident N. S. = Non-Subscribing.

L. M. = Life Members. F. M. = Foreign Members.

N. B.—Members who have changed their residence since this list was drawn up, are requested to give intimation of such a change to the *Secretaries*, in order that the necessary alteration may be made in the subsequent edition. Errors or omissions in the following list should also be communicated to the Secretaries.

Members who are about to leave India and do not intend to return, are particularly requested to notify to the *Secretaries*, whether it be their desire to continue as members of the Society; otherwise, in accordance with Rule 40 of the Bye-laws, their names will be removed from the list at the expiration of three years from the time of their leaving India.

Date of Election.		
1860 Dec. 5.	R.	Abdul-Latif, Khán Bahádúr, Nawab. <i>Calcutta.</i>
1868 Sept. 2.	N.S.	Adam, R. M., Depy. Commissioner, Salt Revenue. <i>Europe.</i>
1880 Dec. 1.	N.R.	Ahmad, Maulawi Dilawar Hasein. <i>Brahmanbariah.</i>
1860 July 4.	N.R.	Ahmad Khán Bahádúr, Sayyid, C. S. I. <i>Aligarh.</i>
1872 April 3.	N.R.	Ahsan-ullah, Nawáb. <i>Dacca.</i>
1860 April 4.	N.R.	Aitchison, J. E. T., M. D., Surgeon-Major, 29th N. I. <i>Pewar Khotel.</i>
1871 June 7.	N.R.	Alexander, J. W., Mayo College. <i>Ajmere, Rajpootana.</i>
1878 Mar. 6.	N.R.	Allen, G. W., C. I. E., <i>Pioneer Press, Allahabad.</i>
1874 June 3.	N.S.	Amír Alí, Sayyid, Barrister at Law. <i>Europe.</i>
1865 Jan. 11.	R.	Anderson, John, M. D., F. R. S., F. L. S., Superintendent, Indian Museum. <i>Calcutta.</i>
1875 June 2.	R.	Apcar, J. G., Barrister at Law. <i>Calcutta.</i>
1875 Feb. 3.	N.R.	Armstrong, J., Surgeon, Beng. Army. Marine Survey Department.
1877 June 6.	N.R.	Arnold, Henry Kerchever Walter. <i>Bombay.</i>
1877 July 4.	R.	Ashgar Alí Khán, Nawáb Diler Jang Bahádúr, C. S. I. <i>Calcutta.</i>
1871 Sept. 6.	N.R.	Atkinson, Edwin Felix Thomas, B. A., C. S., Offg. Acct. General, N. W. P. <i>Allahabad.</i>
1869 Feb. 3.	N.R.	Attar Singh Bahádúr, Sirdár, C. I. E., M. V. F., Chief of Bhadour. <i>Ludiana.</i>
1870 Feb. 2.	N.R.	Baden-Powell, Baden Henry, C. S., Conservator of Forests. <i>Lahore.</i>
1873 Aug. 6.	N.R.	Badgley, Major William Francis, S. C., Offg. Deputy Superintendent of Surveys. <i>Shillong.</i>

Date of Election.		
1862 Feb. 5.	N.R.	Baisák, Gaurdás, Depy. Magistrate. <i>Maldah.</i>
1859 Aug. 3.	R.	Balaichand Siñha. <i>Calcutta.</i>
1865 Nov. 7.	R.	Ball, Valentine, M. A., F. G. S., Geol. Survey of India. <i>Geological Survey Office, Calcutta.</i>
1860 Nov. 1.	R.	Banerjea, Rev. Kristno Mohun, LL. D. <i>Calcutta.</i>
1878 July 3.	N.S.	Barbe, H. L. St., C. S. <i>Europe.</i>
1869 Dec. 1.	L.M.	Barker, R. A., M. D., Civil Surgeon. <i>Bogra.</i>
1879 Aug. 28	N.R.	Barkley, D. G., M. A., C. S., Offg. Commissioner. <i>Lahore.</i>
1860 July 4.	R.	Batten, George Henry Maxwell, C. S., Barrister at Law. <i>Calcutta.</i>
1859 May 4.	L.M.	Bayley, The Hon. Sir Edward Clive, B. C. S., K. C. S. I., C. I. E. <i>Europe.</i>
1878 June 5.	N.R.	Bayley, C. S., C. S., Asst. Secretary to the Chief Com- missioner of Assam. <i>Shillong.</i>
1873 Feb. 5.	R.	Bayne, R. R., M. E. I. B. A., Draughtsman, Chief Engineer's Office, E. I. Railway. <i>Calcutta.</i>
1864 Sept. 7.	N.R.	Beames, John, B. C. S., Offg. Commissioner. <i>Burdwan.</i>
1878 Sept. 25.	N.R.	Beighton, T. D., C. S., Offg. Judge. <i>Rangpur.</i>
1862 Oct. 8.	N.R.	Bernard, Charles Edward, C. S., Offg. Chief Com- missioner. <i>British Burmah.</i>
1872 Aug. 7.	R.	Beverley, Henry, M. A., C. S., District and Sessions Judge, 24-Pergunnahs and Hughli. <i>Calcutta.</i>
1876 Nov. 15.	N.R.	Beveridge, Henry, C. S., District and Sessions Judge. <i>Bankipur.</i>
1878 Oct. 4.	N.R.	Bhakta, Krishna Gopal. <i>Buddungunge.</i>
1879 Mar. 5.	N.R.	Biddulph, Major J., B. S. C., Officer on special duty. <i>Gilgit, Kashmir.</i>
1875 July 7.	N.R.	Black, F. C., Asst. Engineer. <i>Hamirpur, N. W. P.</i>
1873 Dec. 3.	R.	Blackburn, J., Manager, Oriental Gas Company. <i>Calcutta.</i>
1857 Mar. 4.	L.M.	Blanford, H. F., A. R. S. M., F. R. S., F. G. S., Mete- orological Reporter, Govt. of India. <i>Calcutta.</i>
1859 Aug. 3.	F.M.	Blanford, W. T., A. R. S. M., F. R. S., F. G. S., Depy. Supdt., Geological Survey of India. <i>Europe.</i>
1873 April 2.	N.R.	Blissett, T., Superintendent, Telegraph Stores. <i>Nagpur.</i>
1879 Aug. 28.	R.	Blyth, W. D., B. A., C. S., Offg. Joint Magistrate and Depy. Collector, 24-Pergunnahs. <i>Calcutta.</i>
1880 Nov. 3.	N.R.	Bose, Pramatha Nath, B. Sc., F. G. S., Geological Survey of India. <i>Dhar, C. I.</i>
1877 May 2.	R.	Bourdillon, James Austin, C. S., Inspector General of Registration. <i>Calcutta.</i>
1876 Nov. 15.	N.R.	Bowie, Major M. M., Depy. Commissioner. <i>Nagpur.</i>
1868 Jan. 15.	N.S.	Boxwell, John, C. S., Offg. Deputy Commissioner. <i>Europe.</i>
1876 May 4.	N.R.	Bradshaw, Surgeon-Major A. F., Surgeon to the Commander-in-Chief. <i>Simla.</i>
1860 Mar. 7.	R.	Brandis, Dietrich, PH. D., F. L. S., F. R. S., Inspector- General of Forests. <i>Calcutta.</i>

Date of Election.		
1880 Aug. 4.	N.R.	Brown, J. A. <i>Benares.</i>
1879 Jan. 8.	R.	Browne, J. F., C. S., M. E. A. S., Offg. District and Sessions Judge, 24-Pergunnahs. <i>Calcutta.</i>
1879 Mar. 5.	R.	Buckland, C. E., C. S., Magistrate. <i>Howrah.</i>
1879 April 2.	R.	Calcutta, The Rt. Rev., the Lord Bishop of. <i>Calcutta.</i>
1869 Jan. 20.	N.R.	Cadell, Alan, B. A., C. S., Settlement Officer. <i>Banda.</i>
1873 Mar. 5.	R.	Cappel, A. J. L., Offg. Director General of Telegraphs. <i>Calcutta.</i>
1880 Mar. 3.	N.R.	Carlisle, A. C., Archæological Survey of India. <i>Mirzapur.</i>
1876 Nov. 15.	R.	Cayley, Surgeon-Major H., Surgeon, Mayo Native Hospital. <i>Calcutta.</i>
1875 April 4.	R.	Chambers, Dr. E. W. <i>Calcutta.</i>
1879 Nov. 5.	N.S.	Charles, T. E., M. D., F. R. C. P. <i>Europe.</i>
1880 Jan. 7.	R.	Chaudhuri, Govinda Kumara. <i>Calcutta.</i>
1861 Mar. 1.	N.R.	Chaudhuri, Harachandra, Zamindar. <i>Sherpur, Maimansingh.</i>
1880 Nov. 3.	N.R.	Chaudhuri, Khirode Chandra Roy. <i>Jessore.</i>
1874 Aug. 5.	N.R.	Chennell, A. W., Asst. Surveyor, Survey Department. <i>Shillong.</i>
1877 Aug. 30.	N.S.	Clarke, Capt. Henry Wilberforce, R. E., Depy. Consulting Engr., Govt. of India, for Guaranteed Railways. <i>Europe.</i>
1878 Feb. 6.	N.S.	Clarke, Colonel Sir A., R. E., K. C. M. G., C. B., C. I. E. <i>Europe.</i>
1880 Aug. 26.	F.M.	Clerk, Lieut.-Colonel Malcolm G. <i>Europe.</i>
1880 July 7.	R.	Coates, J. M., M. D. <i>Calcutta.</i>
1878 Mar. 6.	R.	Cockerell, H. A., C. S. <i>Calcutta.</i>
1877 Mar. 7.	R.	Colvin, The Hon. Bazett Wetenhall, C. S., Member of the Governor-General's Council. <i>Calcutta.</i>
1874 Nov. 4.	N.R.	Constable, Archibald, Personal Asst. to Chief Engineer, Railway Dept. <i>Lucknow.</i>
1876 Mar. 1.	R.	Crawford, James, B. A., C. S., Barrister at Law, Registrar, High Court. <i>Calcutta.</i>
1877 June 6.	R.	Croft, A. W., M. A., Director of Public Instruction. <i>Calcutta.</i>
1874 Mar. 4.	N.R.	Crombie, Alexander, M. D., Civil Surgeon. <i>Simla.</i>
1877 Feb. 7.	N.R.	Cooke, William, C. S. <i>Awagarh, N. W. P.</i>
1873 Aug. 6.	R.	Cunningham, David Douglas, M. B., Surgeon-General of the Indian Medical Department. <i>Calcutta.</i>
1847 June 2.	F.M.	Dalton, Major-General Edward Tuite, C. S. I., S. C. (retired). Queen Anne's Mansions, St. James's Park, S. W. <i>London.</i>
1873 Dec. 3.	N.R.	Dames, Mansel Longworth, C. S., Asst. Commissioner. <i>Rajampur, Panjab.</i>
1877 June 6.	N.R.	Darbhanga, Mahārājā of. <i>Darbhanga.</i>
1865 June 7.	N.R.	Dās, Rāja Jaykishan, Bahádur, C. S. I. <i>Bijnor.</i>

Date of Election.		
1879 April 2.	N.R.	Dás, Rám Saran, M. A., Grant <i>Ramsarandaspur</i> , near <i>Burrageon, Fyzabad, Oudh.</i>
1869 April 7.	F.M.	Day, Dr. Francis, F. L. S., F. Z. S. <i>Europe.</i>
1856 June 4.	N.R.	DeBourbel, Lieut.-Col Raoul, R. E. <i>Lucknow.</i>
1859 Oct. 6.	N.R.	Delmerick, J. G., Extra Asst. Commissioner. <i>Amballa City.</i>
1862 May 7.	N.R.	Dhanapati Singh Dughar, Rai Bahádúr. <i>Azamganj.</i>
1853 Sept. 7.	N.S.	Dickens, Major-General Craven Hildesley, R. A., C. S. I. <i>Europe.</i>
1870 May 4.	F.M.	Dobson, G. E., B. A., M. B., F. L. S., <i>Royal Victoria Hospital. Netley. Southampton.</i>
1875 Mar. 3.	N.R.	Dodgson, Walter. <i>Rangpur.</i>
1878 May 2.	N.R.	Donaldson, P., Superintendent of the Jail. <i>Buxar.</i>
1875 Mar. 3.	R.	Douglas, J., Supdt. of Telegraphs, Check Office. <i>Calcutta.</i>
1880 June 2.	N.R.	Doxey, The Rev. J. S. <i>Multan.</i>
1879 Feb. 5.	N.R.	Duthie, J. F., Superintendent, Govt. Botanical Gardens. <i>Saharunpore.</i>
1873 Aug. 6.	R.	Dutt, Jogesh Chunder. <i>Calcutta.</i>
1877 Aug. 30.	N.R.	Dutt, Kedarnath, Personal Asst. to the Rajshabye Commissioner. <i>Rampore Bauleah.</i>
1873 April 2.	R.	Dutt, Umesh Chunder. <i>Calcutta.</i>
1870 Mar. 8.	L.M.	Edinburgh, H. R. H. The Duke of. <i>Europe.</i>
1863 May 6.	N.R.	Edgar, John Ware, C. S., C. S. I., Offg. Commissioner. <i>Dhaka. Champaran.</i>
1879 Mar. 5.	R.	Eetvelde, E. van, Consul General for Belgium. <i>Calcutta.</i>
1874 Dec. 2.	N.R.	Egerton, The Hon. Robert Eyles, C. S., K. C. S. I., C. I. E., Lieut.-Governor of the Panjab. <i>Lahore.</i>
1880 April 7.	N.R.	Elias, Ney. <i>Leh, Kashmir.</i>
1871 Dec. 2.	R.	Eliot, J., M. A., Meteorological Reporter to Govt. of Bengal. <i>Calcutta.</i>
1871 Oct. 4.	N.R.	Evezard, Major-General G. E. <i>Deesa, Gujarat.</i>
1859 Dec. 7.	R.	Fath Ali, Maulawi. <i>Calcutta.</i>
1863 Jan. 15.	N.R.	Fedden, Francis, Asst., Geological Survey of India.
1876 Jan. 5.	R.	Feistmantel, Ottokar, M. D., Palæontologist, Geological Survey of India. <i>Calcutta.</i>
1880 April 7.	N.R.	Fiddian, W., M. A., C. S. <i>Kattak.</i>
1879 July 2.	N.R.	Finucane, M., C. S., Joint Magistrate. <i>Gaya.</i>
1869 Sept. 1.	N.R.	Fisher, John Hadden, C. S., Offg. Collector. <i>Mirath.</i>
1872 Dec. 4.	N.R.	Forbes, Major John Greenlaw, R. E., Supdg. Engineer, N. W. P. & Oudh Irrigation Branch. <i>Lucknow.</i>
1876 July 5.	N.R.	Foulkes, The Rev. Thos., F. L. S., M. R. A. S., F. R. G. S., Chaplain. <i>Bangalore.</i>
1869 Sept. 1.	N.R.	Fryer, Lieut.-Col. G. E., Deputy Commissioner. <i>Maulmain, B. Burmah.</i>
1867 Sept. 4.	N.S.	Fyfe, The Rev. W. C., M. A., Principal, Free Church College. <i>Europe.</i>

Date of Election.		
1880 April 7.	N.R.	Gajapati, Ananda Ram, Raja of Vizianagram. <i>Vizianagram.</i>
1873 Dec. 3.	N.R.	Gamble, J. S., B. A., Asst. to Inspector General of Forests. <i>Darjiling.</i>
1871 Aug. 2.	N.R.	Gangaprasad, Munshi, Depy. Collector. <i>Mathura.</i>
1874 July 1.	N.S.	Gardner, David Mason, c. s., Offg. Magistrate and Collector. <i>Europe.</i>
1879 Mar. 5.	R.	Garrett, A.-W., M. A., Inspector of Schools, Presy. Circle. <i>Calcutta.</i>
1859 Aug. 3.	L.M.	Gastrell, Major-General James Eardley (retired). 7, <i>Landsowne Road, Wimbledon.</i>
1867 Dec. 4.	N.R.	Gay, E., M. A., c. s., Depy. Comptroller General. <i>Bombay.</i>
1877 Aug. 30.	R.	Ghosha, Jnanendra Chandra. <i>Calcutta.</i>
1871 May 3.	R.	Ghosha, Kaliprasanna. <i>Calcutta.</i>
1877 Dec. 5.	N.R.	Ghosha, Dr. Krishna Dhana. <i>Rangpur.</i>
1869 Feb. 3.	R.	Ghosha, Pratapachandra, B. A. <i>Calcutta.</i>
1870 May 4.	R.	Ghoshal, Raja Satyanand. <i>Calcutta.</i>
1880 Aug. 4.	R.	Gibbs, The Hon. James, c. s. i., c. i. e., F. R. G. S., M. B. A. S., Member of the Governor General's Council. <i>Calcutta.</i>
1875 July 7.	N.R.	Girdlestone, Charles Edward Ridgway, c. s., Resident. <i>Katmandu, Nepal.</i>
1861 Feb. 5.	F.M.	Godwin-Austen, Lieut.-Colonel H. H., F. R. S., F. Z. S., F. R. G. S. <i>United Service Club, St. James', London.</i>
1862 July 2.	N.R.	Gordon, Robert, c. E., Executive Engineer, P. W. D., <i>Henzada, B. Burmah.</i>
1869 July 7.	N.R.	Gordon, James Davidson, c. s., c. s. i., Offg. Chief Commissioner. <i>Mysore.</i>
1875 July 7.	N.S.	Gouldsbury, J. R. E. <i>Europe.</i>
1863 Nov. 4.	F.M.	Gowan, Major-General J. Y. <i>Woodlands, Wimbledon, London.</i>
1879 Jan. 8.	F.M.	Gowan, Capt. W. E., 21st Nat. Infy. <i>Europe.</i>
1877 Nov. 7.	L.M.	Grant, Alexander, M. I. C. E., Director of State Railways. <i>Europe.</i>
1876 Nov. 15.	N.R.	Grierson, George Abraham, c. s., Offg. Inspector of Schools, Behar Circle. <i>Bankipur.</i>
1861 Sept. 4.	N.R.	Griffin, Lepel Henry, B. C. S., Depy. Commissioner and Offg. Secy. to the Govt. of the Punjab. <i>Lahore.</i>
1878 May 2.	N.R.	Griffith, R. <i>Allahabad.</i>
1861 Feb. 6.	N.R.	Growse, Frederick Salmon, M. A., c. s., c. i. e., Joint Magistrate. <i>Bulandshahr, N. W. P.</i>
1880 Feb. 4.	R.	Gupta, Beharilal, c. s. <i>Calcutta.</i>
1867 July 3.	N.R.	Hacket, Charles Augustus, Assistant, Geol. Survey of India.
1879 Mar. 5.	R.	Harraden, S. <i>Calcutta.</i>
1861 Feb. 2.	N.R.	Harrison, A. S., B. A., Principal, Muir Central College. <i>Allahabad.</i>

Date of Election.		
1877 Sept. 27.	R.	Hart, J., Attorney at Law. <i>Calcutta.</i>
1880 Aug. 26.	N.R.	Hassan, Khalif Syad Mahomed, Khan Bahádur, Prime Minister. <i>Puttiala.</i>
1875 Mar. 3.	N.R.	Hendley, Dr. Thomas Holbein, Residency Surgeon, and Offg. Political Agent, Eastern Rajpootana States. <i>Jaipur, Rájputáná.</i>
1879 Mar. 5.	N.S.	Herschel, Major J., Survey of India. <i>Europe.</i>
1875 Aug. 4.	N.R.	Hewitt, James Francis Katherinus, c. s., Commissioner. <i>Chota Nagpur.</i>
1872 Dec. 4.	R.	Hoernle, Rev. A. F. R., PH. D. <i>Calcutta.</i>
1878 Mar. 6.	N.R.	Hoey, W. <i>Lucknow, Oudh.</i>
1868 Nov. 4.	N.R.	Holroyd, Lieut.-Col. William Rice Morland, Director of Public Instruction. <i>Lahore, Punjab.</i>
1873 Jan. 8.	L.M.	Houstoun, G. L., F. G. S. <i>Johnstone Castle, Renfrewshire, Scotland.</i>
1863 Jan. 15.	N.R.	Howell, Mortimer Sloper, c. s., Judge. <i>Jaunpur.</i>
1867 Aug. 7.	N.R.	Hughes, T. H., A. B. S. M., F. G. S., Geol. Survey of India. <i>Kutná.</i>
1866 Jan. 17.	N.R.	Hughes, Captain W. G., M. S. C., Depy. Commissioner, Hill Tracts. <i>Arracan.</i>
1878 Sept. 25.	N.R.	Hughes, G., c. s., Assistant Commissioner. <i>Abbotabad, Hazara.</i>
1870 Jan. 5.	N.R.	Hume, Allan Octavian, c. B., c. S. <i>Allahabad.</i>
1872 Dec. 4.	N.R.	Ibbetson, Denzil Charles Jelf, c. s., Deputy Commissioner of the Punjab Census. <i>Simla.</i>
1866 Mar. 7.	N.R.	Irvine, William, c. s., Joint Magistrate. <i>Ghazipur.</i>
1871 Mar. 8.	N.S.	Isaac, T. S., c. E. <i>Europe.</i>
1858 Dec. 7.	N.R.	Isvariprasad Singh, Raja. <i>Benares.</i>
1874 Feb. 4.	R.	Jackson, Surgeon Major Charles Julian. <i>Calcutta.</i>
1878 May 2.	N.S.	Jackson, Sir L. S. <i>Europe.</i>
1880 Dec. 1.	N.R.	Jackson, William Grierson, B. C. S. <i>Mirzapur, N. W. P.</i>
1876 July 5.	F.M.	Jarrad, Lieut. F. W., R. N., F. R. A. S., Marine Survey Dept. <i>Hydrographic Office, Admiralty, London.</i>
1879 Mar. 5.	R.	Jarrett, Major H. S., B. S. C., Secy. to the Board of Examiners. <i>Calcutta.</i>
1879 Aug. 6.	F.M.	Joest, Herr W. <i>Cologne.</i>
1866 Feb. 7.	N.R.	Johnson, W. H., c. E. <i>Dera Ismail Khan.</i>
1862 Mar. 5.	N.R.	Johnstone, Lieut.-Colonel James William Hope, Commissioner. <i>Jalandhar.</i>
1867 Dec. 4.	N.R.	Johnstone, Lieut.-Col. James, Depy. Commissioner. <i>Assam.</i>
1878 Aug. 7.	N.R.	Johnstone, P. DeLacy, c. s. <i>Amritsar.</i>
1880 Jan. 7.	N.S.	Johnstone, Capt. W. H., R. E., A. I. C. E. <i>Europe.</i>
1873 Dec. 3.	N.R.	Johore, H. H., Maharaja of, K. C. S. I. <i>New Johore, Singapore.</i>
1873 April 2.	N.R.	Jones, Frederick, c. s., Magistrate and Collector. <i>Tipperah.</i>

Date of Election.		
1875 Nov. 3.	N.R.	Jones, Samuel Simpson, B. A., C. S., Asst. Commissioner. <i>Rajmahal.</i>
1869 April 7.	R.	Kabiruddin Ahmad, Maulawi. <i>Calcutta.</i>
1876 April 5.	R.	Kantichandra Singh, Kumara. <i>Calcutta.</i>
1878 Mar. 6.	N.R.	Keene, H. G., C. S. <i>Agra.</i>
1874 Dec. 2.	N.R.	Khudabakhsh Khan, Maulawi. <i>Patna.</i>
1867 Dec. 4.	R.	King, G., M. B., F. L. S., Supdt., Royal Botanical Gardens. <i>Sibpur, Calcutta.</i>
1862 Jan. 15.	N.R.	King, W., Jr., B. A., F. G. S., Depy. Supdt. for Madras, Geol. Survey of India. <i>Yercaud, Shevaroy Hills, Madras.</i>
1880 Dec. 1.	R.	Kirton, Surgeon-Major William Henry, F. L. S. <i>Calcutta.</i>
1880 Jan. 7.	R.	Kisch, H. M., M. A., C. S. <i>Calcutta.</i>
1877 Jan. 17.	N.R.	Kishor, Kumara Radha Deb, Juvraj of Hill Tipperah. <i>Tipperah.</i>
1875 Dec. 1.	R.	Knight, Hon'ble J. B., C. I. E. <i>Calcutta.</i>
1878 Oct. 4.	N.R.	Lachman Singh, Raja. <i>Bulandshahr.</i>
1880 Aug. 4.	N.R.	Lambe, W., C. S. <i>Jaunpur, N. W. P.</i>
1877 Sept. 27.	N.R.	La Touche, James John Digges, B. A., C. S., Offg. Joint Magistrate. <i>Moradabad.</i>
1878 Aug. 7.	N.R.	Lawrie, Dr. E. <i>Lahore.</i>
1880 Sept. 30.	R.	Lees, R. O. <i>Calcutta.</i>
1879 Dec. 3.	N.R.	Leonard, G. S., Offg. Traffic Supdt., N. B. State Ry. <i>Saidpur.</i>
1870 July 6.	R.	Lethbridge, E. Roper, M. A., C. I. E. <i>Calcutta.</i>
1879 Mar. 5.	R.	Levinge, H. C., C. E., Joint Secy. to the Govt. of Bengal, D. P. W. <i>Calcutta.</i>
1890 July 7.	N.R.	Lewis, Rev. Arthur, B. A. <i>Dera Ghazi Khan.</i>
1873 Feb. 5.	R.	Lewis, Timothy Richards, M. B., Special Asst. to the Sanitary Commissioner with the Government of India. <i>Calcutta.</i>
1864 Nov. 2.	R.	Locke, H. H., Principal, School of Art. <i>Calcutta.</i>
1866 Jan. 17.	N.R.	Low, James, Surveyor, G. T. Survey. <i>B. Burmah.</i>
1869 July 7.	N.R.	Lyall, Charles James, B. A., C. S., Offg. Secy. to the Chief Commissioner of Assam. <i>Shillong.</i>
1875 Jan. 6.	R.	Lydekker, Richard, Asst., Geol. Survey of India. <i>Geological Survey Office, Calcutta.</i>
1870 April 6.	L.M.	Lyman, B. Smith. <i>Japan.</i>
1880 Dec. 1.	R.	McCann, H. W., M. A., D. Sc., Prof., Presidency College. <i>Calcutta.</i>
1868 Dec. 2.	N.R.	Macauliffe, Michael, B. A., C. S., Depy. Commissioner. <i>Hissar, Punjab.</i>
1866 June 6.	N.S.	Macdonald, Lieut.-Col. J., B. S. C., Depy. Superintendent of Surveys. <i>Europe.</i>
1880 June 2.	N.R.	Macdonald, James, C. E. <i>Aligarh.</i>

Date of Election.		
1879 Feb. 5.	N.R.	Macgregor, Capt. C. R., 44th N. I., Transport Officer. <i>Kabul.</i>
1876 Jan. 5.	N.R.	Macgregor, W., Supdt., Telegraphs. <i>Dhubri, Assam.</i>
1848 April 5.	L.M.	MacLagan, Major-General Robert, B. E., F. R. S. E., F. R. G. S. <i>Europe.</i>
1873 Dec. 3.	R.	MacLeod, Surgeon-Major Kenneth, M. D. <i>Calcutta.</i>
1880 May 5.	N.R.	MacLeod, Roderick Henry, B. C. S. <i>Benares.</i>
1879 Aug. 28.	N.R.	Maconachie, R., c. s., Settlement Secy. to the Financial Commissioner. <i>Lahore.</i>
1874 Jan. 7.	N.R.	Magrath, Charles Frederick, B. A., c. s., Offg. Magistrate and Collector. <i>Rangpur.</i>
1867 April 3.	R.	Mainwaring, Lieut.-Col. George Byres, s. c. <i>Serampur.</i>
1880 Mar. 3.	R.	Maliáh, Ramesvar. <i>Howrah.</i>
1876 Dec. 6.	N.S.	Malleson, Col. G. B., c. s. I. <i>Europe.</i>
1878 April 3.	R.	Mallet, F. R., Geological Survey of India. <i>Calcutta.</i>
1864 July 6.	R.	Mallik, Coomar Devendra. <i>Calcutta.</i>
1869 Sept. 1.	R.	Mallik, Yadulál. <i>Calcutta.</i>
1872 Nov. 6.	N.R.	Man, E. H., Asst. Supdt. <i>Port Blair, Andamans.</i>
1880 May 5.	N.R.	Mandalik, The Hon. Rao Sahib Visvanath Narayana, c. s. I. <i>Bombay.</i>
1877 Dec. 5.	N.R.	Mandelli, L. <i>Darjiling.</i>
1869 July 7.	N.R.	Markham, Alexander Macaulay, c. s., Offg. Magistrate and Collector. <i>Allahabad.</i>
1873 July 2.	N.R.	Marshall, C. W. <i>Gonatra, Synthea.</i>
1873 Aug. 6.	N.R.	Marshall, Lieut.-Col. William Elliot.
1877 Feb. 7.	R.	Marshall, Capt. Geo. Fred. Leycester, R. E., Asst. Secy., Govt. of India, P. W. D. <i>Calcutta.</i>
1860 Mar. 7.	R.	Medlicott, H. B., M. A., F. R. S., F. G. S., Supdt., Geological Survey of India. <i>Calcutta.</i>
1877 Mar. 7.	R.	Medlycott, The Rev. Adolphus Edwin, PH. D., 3, <i>Oullen Place, Howrah.</i>
1871 Sept. 6.	N.R.	Miles, Lieut.-Colonel S. B., s. c., Political Agent. <i>Muscat.</i>
1870 July 6.	R.	Miller, A. B., B. A., Barrister at Law, Official Assignee. <i>Calcutta.</i>
1874 May 6.	N.R.	Minchin, F. J. V. <i>Aska, Ganjam.</i>
1875 Aug. 4.	N.R.	Minchin, Lieut.-Col. C. C. <i>Hissar, Panjab.</i>
1856 Mar. 5.	R.	Mitra, Rájendralála, Rái Bahádur, LL. D., C. I. E. <i>Calcutta.</i>
1876 Dec. 6.	N.S.	Mockler, Major E., Political Agent. <i>Europe.</i>
1874 July 1.	R.	Molesworth, G. L., c. E., Consulting Engineer to Govt. of India for State Railways. <i>Calcutta.</i>
1878 May 2.	R.	Moyle, J. C., Barrister at Law, High Court. <i>Calcutta.</i>
1864 Nov. 2.	N.R.	Mukerjea, Bhudeva, Inspector of Schools. <i>Ohinsurah.</i>
1879 May 7.	N.R.	Muir, J. W., M. A., c. s., Barrister at Law. <i>Mainpuri, N. W. P.</i>
1867 Mar. 6.	R.	Mukerjea, The Hon. Pearimohan, M. A. <i>Uttarpara.</i>
1880 Aug. 26.	R.	Mullick, Benod Behari. <i>Calcutta.</i>

Date of Election.		
1880 Aug. 26.	N.R.	Nag, Sib Chunder. <i>Chittagong.</i>
1880 Dec. 1.	R.	Napier, J. R. <i>Calcutta.</i>
1876 May 4.	R.	Nash, A. M., M. A., Professor, Presidency College. <i>Calcutta.</i>
1865 Feb. 1.	R.	Nevill, G., C. M. Z. S., Indian Museum. <i>Calcutta.</i>
1880 Aug. 26.	N.R.	Nicholson, Richardson Walter, Sub-Deputy Opium Agent. <i>Sultannpur, Oudh.</i>
1869 July 7.	N.R.	Nursing Rao, A. V. <i>Vizagapatam.</i>
1871 July 5.	N.R.	Oates, E. W., C. E., Engineer, P. W. D., Garrison Div., Sittang Canal. <i>Rangoon, Pegu.</i>
1874 Oct. 4.	N.S.	O'Kinealy, The Hon'ble James, C. S., District and Sessions Judge, 24-Pergannahs. <i>Europe.</i>
1879 Aug. 28.	N.R.	Oldham, Surgeon-Major C. F., F. R. G. S. <i>Dhumsala, Panjab.</i>
1880 Dec. 1.	N.R.	Oldham, R. D., A. R. S. M., Asst., Geological Survey of India.
1873 Aug. 6.	N.R.	Olpherts, W. J., C. E., Manager, Kaharbari Collieries. <i>Giridhi, E. I. R.</i>
1880 Aug. 4.	L.M.	Pandia, Pandit Mohanlall Vishnulall, F. T. S., Member and Secy., Royal Council of Meywar. <i>Oodeypur.</i>
1880 Jan. 7.	R.	Pargiter, Frederick E., B. A., C. S., Officiating Commissioner of the Sunderbands. <i>Calcutta.</i>
1873 Aug. 6.	R.	Parker, J. C. <i>Calcutta.</i>
1880 Jan. 7.	N.R.	Parry, J. W., C. E., Assoc. M. I. C. E., Asst. Engineer. <i>Gwalior.</i>
1862 May 7.	L.M.	Partridge, Surgeon-Major Samuel Bowen, M. D. <i>Europe.</i>
1879 Mar. 5.	N.R.	Pawsey, R., C. S., Collector. <i>Cuttack.</i>
1871 Dec. 6.	N.R.	Peal, S. E., Manager, Sapakati Tea Estate. <i>Sibsagar, Assam.</i>
1860 Feb. 1.	N.R.	Pearse, Major-General G. G., R. H. A. <i>Bangalore.</i>
1873 Aug. 6.	R.	Pedler, Alexander, F. C. S., Professor of Chemistry, Presidency College. <i>Calcutta.</i>
1864 Mar. 2.	N.R.	Pellew, Fleetwood Hugo, C. S., Offg. Commissioner. <i>Dacca.</i>
1865 Sept. 6.	N.R.	Peppe, T. E. <i>Ranchi.</i>
1877 Aug. 1.	F.M.	Peters, C. T., M. B., Offg. Agency Surgeon. <i>Zanzibar.</i>
1868 May 6.	N.R.	Peterson, F. W., Bombay Mint. <i>Bombay.</i>
1835 July 1.	F.M.	Phayre, Sir Arthur Purves, K. G. S. I., C. B., c/o H. S. King and Co. <i>London.</i>
1872 Dec. 4.	R.	Pránnáth Sarasvati, Pandit, M. A., B. L. <i>Bhowanipur.</i>
1880 June 2.	N.R.	Prasad Sinh, Thakur Garuradhawaya, Raja of Beswan. <i>Beswan Fort, Aligarh.</i>
1877 Aug. 30.	N.R.	Pratapnarayan Singha, Depy. Magistrate. <i>Bankoor.</i>
1878 Feb. 6.	R.	Prinsep, the Hon'ble H. T., Judge of the High Court. <i>Calcutta.</i>
1874 Dec. 2.	N.R.	Protheroe, Major M., Depy. Supdt. of Port Blair and the Nicobars.

Date of Election.		
1871 June 7.	R.	Ramkrishna. <i>Calcutta.</i>
1878 Aug. 29.	N.R.	Rangoon, Right Rev., Bishop of. <i>Rangoon.</i>
1877 May 2.	N.R.	Ravenshaw, Thomas Edw., c. s., Commissioner of Burdwan Division. <i>Ohinsurah.</i>
1880 April 7.	N.R.	Rai, Bipina Chandra, B. L., Munsiff. <i>Netrokona, Maimansingh.</i>
1868 April 1.	N.R.	Rái, Rájá Pramathanath. <i>Digapati.</i>
1877 Aug. 1.	N.R.	Rees, J. C., Asst. Engr., P. W. D. Thonzai, <i>British Burmah.</i>
1871 July 5.	N.S.	Reid, James Robert, c. s. <i>Europe.</i>
1880 Aug. 4.	N.R.	Reynolds, Herbert William Ward, c. s. <i>Jaunpur.</i>
1860 Jan. 3.	N.R.	Rivett-Carnac, John Henry, c. s., C. I. E., F. S. A., Opium Agent. <i>Ghazipur.</i>
1863 April 1.	N.R.	Robertson, Charles, c. s., Secretary to the Govt., N. W. P. and Oudh. <i>Allahabad.</i>
1878 Sept. 25.	R.	Robertson, Rev. J. <i>Calcutta.</i>
1865 Feb. 1.	R.	Robinson, S. H. <i>Calcutta.</i>
1876 Dec. 6.	N.S.	Rodon, Lieut. G. S., Royal Scots. <i>Europe.</i>
1870 Jan. 5.	N.R.	Ross, Major Alexander George, Staff Corps, 2nd in Comd., 1st Sikh Infy. <i>Dera Ghazi Khan, Panjab.</i>
1880 Sept. 30.	N.R.	Sage, E. M. <i>Rangoon.</i>
1877 May 2.	N.R.	Sandford, W., Assistant Traffic Manager, Nizam's State Railway. <i>Secunderabad, Deccan.</i>
1878 Jan. 2.	R.	Sawyer, Capt. H. A., Military Department. <i>Calcutta.</i>
1870 May 4.	N.R.	Schlich, Dr. W. <i>Lahore.</i>
1879 May 7.	N.S.	Schroder, J. <i>Europe.</i>
1869 Feb. 3.	R.	Schwendler, L., Telegraph Store Department. <i>Calcutta.</i>
1879 Feb. 5.	R.	Seonce, Lt.-Col. J., B. S. C. <i>Calcutta.</i>
1876 July 5.	N.R.	Scott, Ross, c. s., Assistant Magistrate and Collector. <i>Furrakhabad.</i>
1874 July 1.	F.M.	Scully, Dr. John, c/o H. S. King and Co. <i>London.</i>
1878 Mar. 6.	N.R.	Sen, Adharlal, B. A., Offg. Depy. Magistrate and Collector. <i>Jessore.</i>
1874 Dec. 2.	N.R.	Sen, Dr. Rám Dás. <i>Berhampur.</i>
1879 Jan. 8.	N.R.	Sewell, R., M. S. C., c/o Messrs. Arbuthnot and Co. <i>Madras.</i>
1878 May 2.	R.	Sharpe, C. J. <i>Calcutta.</i>
1879 May 7.	N.R.	Sheridan, C. J., C. E. <i>Lucknow.</i>
1878 April 3.	R.	Simson, A. <i>Calcutta.</i>
1867 April 3.	R.	Sirkár, Dr. Mahendralála. <i>Calcutta.</i>
1872 Aug. 7.	N.R.	Skrefsrud, Rev. L. O., India Home Mission to the Santhals. <i>Dúmká, Santhal Purgunnahs.</i>
1864 Sept. 7.	N.S.	Sladen, Col. E. B., M. S. C., Commissioner, Arracan Division. <i>Europe.</i>
1865 July 5.	R.	Smith, David Boyes, M. D. <i>Calcutta.</i>
1874 June 3.	N.R.	Smith, Vincent Arthur, c. s., Asst. Settlement Officer. <i>Bareilly, N. W. P.</i>

Date of Election.		
1879 Mar. 5.	N.S.	Someren, Capt. G. J. van. <i>Europe.</i>
1878 Mar. 6.	R.	Souttar, W. M., Chairman of the Corporation. <i>Calcutta.</i>
1877 April 4.	N.R.	Spens, The Rev. A. N. W., Chaplain. <i>Sialkot.</i>
1872 July 3.	N.R.	Stephen, Carr, B. L., Judl. Asst. Commr. <i>Ludianah.</i>
1879 Oct. 2.	R.	Sterndale, R. A., F. R. G. S., Asst. Comr. of Currency. <i>Calcutta.</i>
1875 July 7.	R.	Stewart, M. G. <i>Calcutta.</i>
1876 Aug. 2.	N.R.	St. John, Lieut.-Col. Oliver Beauchamp, B. E., C. S. I., Political Officer. <i>Kandahar.</i>
1861 Sept. 4.	R.	Stokes, The Hon'ble Whitley, C. S. I., C. I. E. <i>Calcutta.</i>
1869 Feb. 3.	N.S.	Strachey, Sir J., K.C.S.I., C. I. E. <i>Europe.</i>
1859 Mar. 2.	N.R.	Stubbs, Lieut.-Col. Francis William, Royal Artillery.
1880 Nov. 3.	N.R.	Sturt, Lieut. Robert Ramsay Napier, B. S. C., Panjab Frontier Force. <i>Edwardesabad, Panjab.</i>
1864 Aug. 11.	R.	Swinhoe, W., Attorney-at-Law. <i>Calcutta.</i>
1880 Nov. 3.	N.R.	Swynnerton, Rev. Charles. <i>Naushera.</i>
1880 June 2.	N.R.	Sykes, John Gastrell, LL. B., Barrister-at-Law and Advocate, High Court, N. W. P. <i>Allahabad.</i>
1871 Mar. 1.	R.	Tagore, Dvijendranath. <i>Calcutta.</i>
1871 Jan. 4.	R.	Tagore, Gunendranath. <i>Calcutta.</i>
1868 June 3.	R.	Tagore, The Hon'ble Maharaja Jotendra Mohun, C. S. I. <i>Calcutta.</i>
1865 Sept. 6.	R.	Tawney, C. H., M. A., Principal, Presidency College. <i>Calcutta.</i>
1874 Mar. 4.	R.	Taylor, Commander A. D., late Indian Navy. <i>Calcutta.</i>
1860 May 2.	N.S.	Temple, Sir R., Bart., K. C. S. I., C. I. E., B. C. S. <i>Europe.</i>
1878 June 5.	N.R.	Temple, Lieut. R. C., s. c., Cantonment Magte. <i>Ferozepore, Punjab.</i>
1876 Feb. 2.	R.	Tennant, Col. James Francis, B. E., F. R. S., C. I. E. Mint Master. <i>Calcutta.</i>
1875 June 2.	N.R.	Thibaut, Dr. G., Prof. Sanskrit College. <i>Benares.</i>
1869 Oct. 6.	N.R.	Thomson, A., The College, <i>Agra.</i>
1875 Nov. 3.	N.R.	Thomson, Robert George, C. S., Asst. Commr. <i>Jhelum, Panjab.</i>
1847 June 2.	L.M.	Thuillier, Major-Genl. Sir Henry Edward Landor, B. A., C. S. I., F. R. S. <i>Care of Messrs. Grindlay and Co., 55, Parliament St., London.</i>
1865 July 5.	N.R.	Tolbort, Thos. Wm. Hooper, C. S., Offg. Deputy Commissioner. <i>Gujranwala.</i>
1871 April 5.	F.M.	Trefftz, Oscar. <i>Care of Messrs. E. D. Keilhorn and Co., 16, St. Mary Axe, London.</i>
1861 June 5.	L.M.	Tremlett, James Dyer, M. A., C. S. Addl. Commissioner. <i>Jalandhar, Panjab.</i>
1872 July 3.	N.R.	Trevor, Lieut.-Col. William Spottiswoode, B. E., Chief Engineer and Secy. to Chief Commissioner. <i>Rangoon.</i>

Date of Election.		
1880 Mar. 3.	N.R.	Tufnell, Lieut. R. H. C., 30th M. N. I. 7, <i>High Road, Nungambankun, Madras.</i>
1873 April 6.	R.	Turnbull, Robert, Secretary to the Corporation. <i>Calcutta.</i>
1863 May 6.	N.R.	Tyler, J. W., M. D., F. R. C. S., Supdt., Central Prison, <i>Agra.</i>
1869 Aug. 4.	R.	Wáhid Ali, Prince Jahán Qadr Muhammad, Bahá-dur. <i>Garden Reach.</i>
1865 Nov. 1.	R.	Waldie, David, F. C. S. <i>Calcutta.</i>
1861 May 1.	R.	Walker, Major-Genl. James T., R. E., C. B., F. R. S., Surveyor General of India. <i>Calcutta.</i>
1875 April 7.	N.S.	Wall, Dr. Alfred John. <i>Europe.</i>
1863 Oct. 7.	R.	Waller, Walter Kerr, M. B. <i>Calcutta.</i>
1865 May 3.	F.M.	Waterhouse, Major James, B. S. C., Dy. Supdt., Survey of India. <i>Europe.</i>
1874 July 1.	N.S.	Watt, Dr. George, Professor. <i>Europe.</i>
1876 Dec. 6.	R.	Webb, W. T., M. A., Professor, Presidency College. <i>Calcutta.</i>
1879 Mar. 5.	N.R.	Weekes, A., C. S., Collector. <i>Faridpur.</i>
1869 Sept. 1.	R.	Westland, James, C. S., Offg. Comptroller General. <i>Calcutta.</i>
1867 Feb. 6.	N.R.	Westmacott, Edward Vesey, B. A., C. S., Offg. Magte. and Collr. <i>Noakholly.</i>
1862 Oct. 8.	N.S.	Wheeler, James Talboys. <i>Europe.</i>
1878 Aug. 29.	N.R.	Wheeler, P. C., C. S., Asst. Magistrate. <i>Ghazipur.</i>
1875 Feb. 3.	N.R.	Whiteway, Richard Stephen, C. S., Asst. Settlement Officer. <i>Muttra.</i>
1878 Aug. 29.	N.R.	Whittall, R., Forest Dept. <i>Hoshangabad, Central Provinces.</i>
1873 May 7.	N.R.	Williams, George Robert Carlisle, B. A., C. S., Magte. and Collr. <i>Farakhabad.</i>
1867 Jan. 16.	N.R.	Williamson, Capt. William John, C. I. E., Insp.-Genl. of Police. <i>Shillong, Khasi Hills.</i>
1880 Feb. 4.	R.	Wilson, The Hon. Arthur. <i>Calcutta.</i>
1870 Aug. 3.	N.S.	Wilson, Robert Henry, B. A., C. S., Offg. Secy. to Board of Revenue. <i>Europe.</i>
1878 Mar. 6.	N.R.	Wilson, J. <i>Sirsa, Punjab.</i>
1866 Mar. 7.	L.M.	Wise, Dr. J. F. N. <i>Rostellan, County Cork. Ireland.</i>
1867 July 3.	N.R.	Wood, Dr. Julius John, Supdt. of Vaccination. <i>Darjiling Circle.</i>
1870 Jan. 5.	R.	Wood-Mason, James, Depy. Supdt., Indian Museum. <i>Calcutta.</i>
1873 Aug. 6.	N.R.	Woodthorpe, Capt. Robert Gossett, R. E., Asst. Supdt., Survey of India. <i>Frontier Expeditionary Force. Kabul.</i>

HONORARY MEMBERS.

1821 Mar. 6.	Sir John Phillippart. <i>London.</i>
1826 July 1.	Count de Noe. <i>Paris.</i>
1834 May 6.	Professor Isaac Lea. <i>Philadelphia.</i>
1847 Sept. 1.	Col. W. Munro. <i>London.</i>
1847 Nov. 3.	His Highness the Nawáb Nazim of Bengal. <i>Europe.</i>
1848 Feb. 2.	Dr. J. D. Hooker, B. N., F. R. S. <i>Kew.</i>
1853 April 6.	Major-Genl Sir H. C. Rawlinson, K. C. B. <i>London.</i>
1858 July 6.	B. H. Hodgson. <i>Europe.</i>
1860 Mar. 7.	Professor Max Müller. <i>Oxford.</i>
1860 Nov. 7.	Edward Thomas. <i>London.</i>
1860 " 7.	Dr. Aloys Sprenger. <i>Bern.</i>
1860 " 7.	Dr. Albrecht Weber. <i>Berlin.</i>
1868 Feb. 5.	General A. Cunningham, C. S. I. <i>India.</i>
1868 " 5.	Professor Bápu Déva Sástri. <i>Benares.</i>
1868 " 2.	A. Grote. <i>London.</i>
1871 " 7.	Charles Darwin. <i>London.</i>
1872 " 1.	Sir G. B. Airy. <i>London.</i>
1872 June 5.	Professor T. H. Huxley. <i>London.</i>
1875 Nov. 3.	Dr. O. Böttlingk. <i>Jena.</i>
1875 " 3.	Professor J. O. Westwood. <i>Oxford.</i>
1876 April 5.	Col. H. Yule, R. E., C. B. <i>London.</i>
1876 " 5.	Dr. Werner Siemens. <i>Berlin.</i>
1877 Jan. 17.	Dr. John Muir. <i>Edinburgh.</i>
1879 June 4.	Prof. E. B. Cowell, D. C. L. <i>Cambridge.</i>
1879 " 4.	Dr. A. Günther, V. P. R. S. <i>London.</i>
1879 " 4.	Dr. J. Janssen. <i>Paris.</i>
1879 " 4.	Prof. H. Milne-Edwards. <i>Paris.</i>
1879 " 4.	Prof. P. Regnaud. <i>Lyons.</i>
1879 " 4.	M. E. Renan. <i>Paris.</i>

CORRESPONDING MEMBERS.

1844 Oct. 2.	Macgowan, Dr. J. <i>Europe.</i>
1856 June 4.	Krämer, Herr A. von. <i>Alexandria.</i>
1856 " 3.	Porter, Rev. J. <i>Damascus.</i>
1856 " 4.	Schlagintweit, Herr H. von. <i>Berlin.</i>
1856 " 4.	Smith, Dr. E. <i>Beyrout.</i>
1859 " 4.	Tailor, J., Esq. <i>Bussorah.</i>
1857 Mar. 4.	Nietner, J., Esq. <i>Ceylon.</i>
1858 " 3.	Schlagintweit, Herr R. von. <i>Berlin.</i>
1859 Nov. 2.	Frederick, Dr. H. <i>Batavia.</i>
1860 Feb. 1.	Baker, The Rev. H. <i>E. Malabar.</i>
1861 July 3.	Gösche, Dr. R.
1862 Mar. 3.	Murray, A., Esq. <i>London.</i>
1863 July 4.	Barnes, R. H., Esq. <i>Ceylon.</i>
1866 May 7.	Schlagintweit, Prof. E. von. <i>Berlin.</i>
1868 " 5.	Holmböe, Prof. <i>Christiania.</i>

ASSOCIATE MEMBERS.

1865 May 3.	Dall, Rev. C. H.	<i>Calcutta.</i>
1874 Feb. 4.	Schaumburgh, J., Esq.	<i>Calcutta.</i>
1874 April 1.	Lafont, Rev. Fr. E., S. J., C. I. E.	<i>Calcutta.</i>
1875 Dec. 1.	Bate, Rev. J. D.	<i>Allahabad.</i>
1875 „ 1.	Maulawí Abdul Hai,	<i>Madrasah. Calcutta.</i>

LIST OF MEMBERS WHO HAVE BEEN ABSENT FROM INDIA * THREE YEARS AND UPWARDS.*

* *Rule 40.*—After the lapse of 3 years from the date of a Member leaving India, if no intimation of his wishes shall in the interval have been received by the Society, his name shall be removed from the list of Members.

The following Members will be removed from the next Member List of the Society under the operation of the above Rule.

Major-Gen. C. H. Dickens, R. A., C. S. I., ...	1877.
J. R. E. Gouldsbury, Esq.,	1877.
Lieut.-Col. J. Macdonald,	1877.
Col. G. B. Malleson, C. S. I.,	1877.
Lieut. G. S. Rodon,	1877.

LOSS OF MEMBERS DURING 1880.

BY RETIREMENT.

W. E. Brooks, Esq.	<i>Muddapur.</i>
H. Buckle, Esq.	<i>Tounghoo.</i>
Col. H. A. Browne.	<i>Rangoon.</i>
C. D. Field, Esq.	<i>Burdwan.</i>
J. C. Macdonald, Esq.	<i>Naini Tal.</i>
Hon. G. G. Morris.	<i>Calcutta.</i>
E. O'Brien, Esq.	<i>Muzaffargarh.</i>
Dr. D. O'C. Raye.	<i>Calcutta.</i>
Dr. V. Richards.	<i>Goalundo.</i>
Hon. J. Sewell White.	<i>Calcutta.</i>

BY DEATH.

Ordinary Members.

H. L. Dennys.	<i>Damoh, C. P.</i>
Thakur Giriprasad Singh.	<i>Aligarh.</i>

Honorary Members.

Hon. Sir J. W. Colvile, Kt. *Europe.*

Corresponding Member.

Rev. M. A. Sherring, M. A. *Benares.*

BY REMOVAL.

Under Rule 40.

J. Smidt. *Europe.*

R. Taylor, O. S. *Europe.*

Under Rule 38.

J. F. Baness, Esq. *Calcutta.*

P. Dejoux, Esq. *Calcutta.*

J. S. Gunn, Esq., M. B. *Sandáwar.*

W. Porter, Esq. *Akyab.*



[APPENDIX.]

ABSTRACT STATEMENT
OF
RECEIPTS AND DISBURSEMENTS
OF THE
ASIATIC SOCIETY OF BENGAL
FOR
THE YEAR 1880.

STATEMENT, *Asiatic Society of*

Dr.

To ESTABLISHMENT.

Salaries, ...	...	...	Rs. 4,421 15 1
Commission, ...	...	...	... 269 15 2
Pensions, ...	...	...	... 102 0 0
			<hr/>
			4,793 14 3
			<hr/>

CONTINGENCIES.

Stationery, ...	...	...	... 304 11 9
Lighting, ...	...	...	... 86 8 0
Building, ...	...	...	... 343 4 0
Taxes, ...	...	...	... 780 0 0
Postage, ...	...	...	... 496 5 9
Freight, ...	...	...	... 26 0 0
Meetings, ...	...	...	... 96 12 0
Miscellaneous, ...	...	...	... 409 12 1
			<hr/>
			2,553 5 7
			<hr/>

LIBRARY AND COLLECTIONS.

Books, ...	...	...	... 1,695 1 6
Local Periodicals, ...	...	...	... 66 12 0
Book-cases, ...	...	...	... 1,036 0 0
Binding, ...	...	...	... 529 14 0
Coins, ...	...	...	... 138 9 1
			<hr/>
			3,466 4 7
			<hr/>

PUBLICATIONS.

Printing, ...	...	...	... 3,849 8 0
Plates, ...	...	...	... 2,465 12 3
			<hr/>
			6,315 4 3
			<hr/>

To PERSONAL ACCOUNT (Writes off and Miscellaneous),... 954 6 5

Total Expenditure, ... 18,083 3 1

To Balance, 1,44,416 14 11

Total, Rs. ... 1,62,500 2 0

No. 1.
Bengal.

Cr.

By Balance from last Report, Rs. 1,43,434 0 11

By CASH RECEIPTS.

Publications sold for Cash,	...	...	223	1	6
Interest on investments, ...	...	...	6,179	0	0
Coins, ...	...	...	1	15	6
Contingencies, ...	...	...	4	1	6
Furniture (sale of old show cases),	...	...	23	4	6
			<hr/>		
			6,431	7	0
			<hr/>		

By PERSONAL ACCOUNT.

Admission Fees, ...	...	...	1,168	0	0
Subscriptions, ...	...	...	7,695	0	0
Sales on credit, ...	...	...	1,570	14	0
Miscellaneous (chiefly old outstandings and omissions brought to credit),	...	...	2,200	12	1
			<hr/>		
			12,634	10	1

Total Income,

 19,066 1 1

Total, Rs. ...

 1,62,500 2 0

JOHN C. DOUGLAS,
Honorary Treasurer, Asiatic Society.

J. WESTLAND, }
J. SCORCE, } *Auditors.*

STATEMENT, *Oriental Publication Fund in Account*

Dr.

To CASH EXPENDITURE.

Printing charges,	...	...	Rs. 5,230	2	3
Plates,	...	...	...	84	0 0
Editing charges,	...	...	...	973	8 0
Salaries,	...	...	...	866	3 2
Advertising,	...	...	...	120	0 0
Freight,	...	...	...	16	2 6
Contingencies,	...	...	...	94	12 0
Postage,	...	...	...	38	8 3
Commissions on collecting bills,	...	...	...	1	8 3

 7,424 12 5

To PERSONAL ACCOUNT (Writes off and Miscellaneous), ... 138 7 0

 Total Expenditure,

 7,563 3 5

 To Balance, ...

 10,540 9 11

 Total, Rs. 18,103 13 4

No. 2.

with the Asiatic Society of Bengal.

Cr.			
By Balance from last Report, ...	...	...	Rs. 5,004 13 10
By CASH RECEIPTS.			
Government allowance, ...	...	...	9,000 0 0
Publications sold, ...	...	...	2,105 2 0
Advances recovered, ...	...	...	103 11 9
			<hr/>
			11,208 13 9
By PERSONAL ACCOUNT.			
Sales on credit, ...	...	...	1,758 1 9
Miscellaneous, ...	...	...	132 0 0
			<hr/>
			1,890 1 9
Total Income,			<hr/>
			13,098 15 6

Total, Rs. 18,103 13 4

JOHN C. DOUGLAS,
Hony. Treasurer, Asiatic Society.

J. WESTLAND, }
J. SCONCE, } *Auditors.*

STATEMENT,
Sanskrit Manuscripts Fund in Account

Dr.

To CASH EXPENDITURE.			
Salaries, ...	...	Rs. 1,883	2 0
Travelling expenses, ...	...	...	291 6 0
Printing, ...	...	...	489 4 0
Plates, ...	...	...	116 14 0
MSS. purchased, ...	...	...	1,103 7 0
Stationery, ...	...	...	19 12 0
Postage, ...	...	...	0 13 6
Copying, ...	...	...	10 2 0
Contingencies, ...	...	...	26 7 0
Total Expenditure, —————			3,441 3 6
To Balance, ...	...	...	2,131 14 2
			Total, Rs. 5,573 1 8

No. 3.

with the Asiatic Society of Bengal.

Cr.

By Balance from last Report, ...	...	...	Rs. 2,339 14 8
By CASH RECEIPTS.			
Government allowance, ...	...	...	3,200 0 0
Balance of petty cash recovered, ...	...	...	1 1 0
Publications sold for cash, ...	...	...	8 2 0
			<hr/> 3,209 3 0
By PERSONAL ACCOUNT.			
Publications sold on credit, ...	...	...	24 0 0
Total Income, —————			3,233 3 0
			<hr/>
Total, Rs. 5,573 1 8			<hr/>

JOHN C. DOUGLAS,

Hony. Treasurer, Asiatic Society.

J. WESTLAND, }
 J. SCONCE, } *Auditors.*

STATEMENT, *Personal*

Dr.

To Balance from last Report,	4,612	3	4
To CASH EXPENDITURE.			
Advances for purchase of Sanskrit MSS., postage of books			
to Members, &c.,	1,339	8	5
To Asiatic Society,	12,634	10	1
To Oriental Publication Fund,	1,890	1	9
To Sanskrit Manuscripts Preservation Fund,	24	0	0

Total, .. 20,500 7 7

No. 4.
Account.

Cr.

By Cash Receipts,	12,427	4	3
By Asiatic Society,	954	6	5
By Oriental Publication Fund,	138	7	0

By Balances.	Due to the Society.			Due by the Society.		
Old claims,.. ..	1,146	14	..	..	..	..
Members,	4,514	8	1	186	12	11
Subscriptions to Publications,	1,293	13	2	2,235	12	6
Employees,	471	4	..	..	..	..
Agents,	1,930	2	7	..	..	..
Miscellaneous,	278	12	..	232	6	6
	9,635	5	10	2,654	15	11

6,980 5 11

Total, .. 20,500 7 7

JOHN C. DOUGLAS,

Hony. Treasurer, Asiatic Society.

J. WESTLAND, }
J. SCORCE, } *Auditors..*

STATEMENT, *Invest*

Dr.				Nominal.	Actual.
To Balance, .. ..	..	..	..	1,48,300 0 0	1,47,618 0 0
Total, ..				1,48,300 0 0	1,47,618 0 0

STATEMENT, *Trust*

Dr.					
Remitted for Blochmann Memorial, .. ..	..	..	..	1,268 4 6	
To Balance (being servants' pension fund only), ..	..	..	..	1,007 11 4	
Total, ..				2,275 15 10	

STATEMENT, *Cash.*

Dr.					
To Balance from last Report, .. ..	..	..	..	10,974 9 11	
RECEIPTS.					
To Personal account, .. ..	..	..	..	12,427 4 3	
To Asiatic Society, .. ..	..	..	..	6,431 7 0	
To Oriental Publication Fund, .. ..	..	..	..	11,208 13 9	
To Sanskrit Manuscripts Fund, .. ..	..	..	..	3,209 3 0	
Total, ..				44,251 5 11	

By an error of transcription the Dr. figures in Statement No. 5, Investments, have been written on the right side, and the Cr. figures on the left side: they should be transposed.

STATEMENT, No. 8.

Balance Sheet.

Dr.

To Asiatic Society, ...	1,44,416 14 11
To Sanskrit Manuscripts Fund, ...	2,131 14 2
To Oriental Publication Fund, ...	10,540 9 11
To Trust Funds, ...	1,007 11 4
Total,...	1,58,097 2 4

Cr.

By Personal Account, ...	...	6,980 5 11
By Cash, ...	...	3,498 12 5
By Investments, ...	...	1,47,618 0 0
Total, ...	...	1,58,097 2 4

Rs.

JOHN C. DOUGLAS,

Hon'y. Treasurer, Asiatic Society.

J. WESTLAND, }
J. SCORCE, } *Auditors.*

PROCEEDINGS
OF THE
ASIATIC SOCIETY OF BENGAL.

FOR JANUARY, 1881.

The Monthly General Meeting of the Asiatic Society of Bengal was held on Wednesday, the 5th of January 1881, at 9 P. M.

H. B. MEDLICOTT, Esq., F. R. S., in the Chair.

The minutes of the last Meeting were read and confirmed.

The following presentations were announced—

1. From Dr. R. L. Mitra,—Nidāna, a Sanskrit system of Pathology, translated into Bengali by Uday Chand Dutt.

2. From the Meteorological Reporter for Western India,—(1) Brief sketch of the Meteorology of the Bombay Presidency in 1879, (2) Abnormal Variations of Barometric Pressure in the Tropics and their relation to Sunspots, Rainfall and Famine.

3. From the Hon'ble Whitley Stokes,—*Über die Sprache der Etrusker*, (2 vols.), by W. Corssen.

4. From the Madras Government,—Report on the Amravati Tope, and excavations on its site in 1877, by R. Sewell.

5. From the Department of the Interior, U. S. America,—History of the North American Pinnipeds by J. A. Allen.

6. From the Home, Revenue and Agricultural Department,—(1) Report on the Amravati Tope, and excavations on its site in 1877, by R. Sewell, (2) Max Müller's Sacred Books of the East, Vols. IV, V, and VII.

7. From the Authors,—(1) An account of the Country traversed by the second column of the Tal-Chotiali Field Force in the spring of 1879, by Lieut. R. C. Temple, (2) Gulshan-i-Raz, the Mystic Rose Garden of Sa'd-ud-din Mahmud Shabistari, by E. H. Whinfield.

8. From Pandit Mohanlal Vishnulal Pandia,—Nos. 1—9 of Harischandra Chandrika and Mohan-chandrika.

9. From Surgeon-Major A. F. Bradshaw,—Hindu Matrimony, by Babu B. C. Bose.

10. From the Trustees of the British Museum,—Illustrations of Typical specimens of Lepidoptera Heterocera in the Collection of the British Museum, Part IV, by Lord Walsingham.

The following Gentlemen are candidates for ballot at the next meeting—

1. P. J. Carter, Esq., Forest Department, British Burmah, proposed by E. W. Oates, Esq., seconded by A. Pedler, Esq.

2. Capt. T. Morris Jenkins, Asst. Commissioner, British Burmah, proposed by E. W. Oates, Esq., seconded by A. Pedler, Esq.

3. Major W. F. Prideaux, Calcutta, proposed by A. Pedler, Esq., seconded by Capt. W. H. Johnstone, R. E.

4. R. C. Laughlin, Esq., proposed by J. C. Douglas, Esq., seconded by L. Schwendler, Esq.

5. Dr. G. Bomford, Garrison Surgeon, Fort William, proposed by Dr. A. F. Bradshaw, seconded by A. Pedler, Esq.

The SECRETARY reported that Mr. H. A. Cokerell and Mr. J. G. Apear had intimated their desire to withdraw from the Society, and that Mr. W. T. Webb had requested that his letter of resignation might be cancelled.

The following papers were read—

1. *On the Identification of Certain Diamond Mines in India which were known to and worked by the ancients, especially those which were visited by Tavernier.*—By V. BALL, M. A., F. G. S.

(Abstract.)

In this paper the author gives the result of his investigations into the identity of the diamond mines visited and described by Tavernier which have long afforded matter for more or less vague speculation to numerous writers on the subject.

RAOLCONDA is believed to be identical with Rawdukonda in the district of Mudgul in the Nizam's Dominions: it is situated near the Tungabudra river in Lat. $15^{\circ} 41'$ Long. $76^{\circ} 50'$.

GANI-COULOUR is shown to be identical with Kollur on the Kistna river, Lat. $16^{\circ} 42' 30''$, Long. $80^{\circ} 5'$. Under this heading there is a note on the Great Mogul diamond and its identity with the Koh-i-nur. The prefix Gani is supposed to be simply the Persian *Kan-i-* (*i. e.* mine of). And the title *Koh-i-nur* may have been suggested by the meaningless name Kollur.

SOMELPOUR appears to have been situated in Chutia Nagpur and probably was in Palamow. It is quite a distinct locality from Sam-

balpur on the Mahanadi with which it has been the custom, hitherto, to identify it. Its position was about Lat. $23^{\circ} 35'$ Long. $84^{\circ} 21'$.

BEIRAGURH, mentioned in the Ain-i-Akbari as having diamond mines, is shown to be identical with Wairagurh in the Chanda district, Lat. $20^{\circ} 26'$, Long. $80^{\circ} 10'$, where the remains of the mines are still to be seen.

This paper will be published in full in the Journal, Part II.

2. *On a forgotten Record of the occurrence of the Lion in the District of Palamow and its connection with some other facts regarding the Geographical Distribution of Animals in India.*—By V. BALL, M. A., F. G. S.

I have taken the above title for this paper in consequence of the fact that in the accounts of the distribution of the lion in India by the principal writers on the subject, there is no notice of the following statement which occurs in a work by Surgeon Breton "on the Medico-Topography of the Ceded Provinces of the South-West Frontier" published in the year 1826.* The following is the passage: "A lion in 1814 was shot by the natives near the village of Koondra in Palamow and its skin was seen and recognized by Mr. W. M. Fleming, the then Magistrate of Ramgurb, to be that of a lion." Surgeon Breton adds, "Possibly this may have been a stray animal, for the lion is very little known in South Behar, although the name of *Sheerbubbur* (lion) is familiar to the more intelligent of the natives."

It may appear at first sight that such slight evidence as the above is not of much importance, but viewed in connection with other facts regarding the geographical distribution of animals in India, it is of no little interest.

Mr. W. T. Blanford in a paper published in the Journal for 1867 gives a *resumé* of the information of which he was then in possession as to the distribution of the lion in India during the present century. The most eastern locality he mentions is Sheorajpur, twenty-five miles to the west of Allahabad where a lion was killed in 1864, and he records another as having been killed in Rewah in 1866.

I am inclined to believe in an inherent probability that the lion formerly occurred in Palamow from the fact that I have observed peculiarities in the fauna of that sub-division which serve to separate it from the regions surrounding it, and that in fact it should be regarded as an eastern prolongation of the Gangetic province of Blanford. In a paper published in the Proceedings "On the Mammals of the Mahanadi basin" I stated that so far as I then knew, the Indian Gazelle (*G. Bennettii*) did

* Govt. Lith. Press, Calcutta, and Transactions of the Medical and Physical Society of Calcutta, Vol. II, P. A. S. B. 1877, p. 168.

not occur to the east of Sirguja; but since that time I have found that it is not uncommon in Palamow, having been seen by me as far east as Latiahar, Long. $84^{\circ} 35' E$.

Again in a paper on the distribution of birds throughout the region extending from the Ganges to the Godavari,* I have pointed out that there were indications that Palamow, in consequence of the occurrence within its limits of certain species would in all probability prove to belong to a region or sub-province of geographical distribution distinct from that which includes the rest of Chutia Nagpur.

Although the lion mentioned by Surgeon Breton may have been a stray or solitary one, the fact that Palamow is up to the present day included in the range of the Gazelle, would seem to shew that it had not wandered beyond its legitimate province. This, taken with the fact that the Gazelle and some species of birds keep within these boundaries which are not limited on the south by more than an easily traversable range of hills, affords a case of limitation of distribution sufficiently remarkable to be worthy of permanent record.

3. *A find of coins struck by Gazni Sultans in Lahore.*—By C. J. RODGERS, Principal, College Amritsar.

Some time ago in wandering about the city of Amritsar, as I am pretty well known as an old coin collector, a young Sarráf asked me to look at some coins he had just received. There were two small bags full of them, so I asked permission to take them home and examine them, at my leisure. This was readily granted. On getting them home I examined them, and they proved to be coins of Masaud I of Gazni, Maudúd, Abd-ur Rashíd, Farrukhzád and Ibrahim, struck in Lahore.

The coins of Masaud were of the horse and bull type with the name مسعود over the horse. But there were several varieties of this exceedingly rare coin. Several had the name just as I have written it. Some had مسعود محمد which is very strange, as the two brothers were deadly enemies to each other. Some had مسعود محمود which is not so strange, as Masaud was son of Mahmúd. Some had مسعود which is only a variety of the first. I did not notice one with محمد simply on it, although Thomas in the Chronicles of the Pathán kings says that Sir E. C. Bayley has one of these coins with *Muhammad* on it and one with Masaud.† From this I infer that Mr. Thomas knew of no others. Before this find I had three of Masaud's of this type, and the Rev. J. Doxie has one of Muhammad. Two of the coins of this find had a new name over the horse موردود. There is no mint mark on these coins. But as they were found with a

* Stray Feathers, Vol. VIII.

† Thomas gives a figure of this coin of Masaud on p. 58.

lot which were all of one mint, and as the whole of the coins were of the same style as to finish and as to metal, I infer that the few without mint names were of the same mint as those which had mint names. Hence I have no hesitation in calling these coins Lahore ones. The Gazni coins are altogether of another type as to execution of inscription and animal-drawing and metal.

Of Maudúd there were, besides the one type already mentioned, three other distinct types. They all had the bull on one side, and over it was the usual inscription in Hindí *Srī Samanta Deva*. The obverses of the coins were covered with Arabic inscriptions round which were margins in Arabic giving originally the mint town and date. In these margins wherever the mint town comes, it is spelt **لوهور** or Lohor. The inscriptions were :—

(a)	(b)	(c)
ابوالفتح	عدل	ابوالفتح
شهاب الدولة	شهاب الدولة	الاخير الامرا
وقطب الملة	وقطب الملة	شهاب الدولة
مودود	ابو الفتح	مودود
	مودود	

The third type has not been published. The dates in the margin are *four* and *five* (only the *unit* figures or words rather are on the coins). Hence as Maudúd reigned from A. H. 432 to 440, the dates are 434 and 435 A. H. Of this third type there were only two. Of type (b) there were 19. Of type (a) no less than 35, but some of them were very much the worse for their being 800 years old.

Of *Abd-ur Rashid* there were several types. All had the bull reverse. The obverse was covered with inscriptions in a circular area round which was a margin sometimes of dots, sometimes of words stating mint town and date.

(a).	(b)	(c).
عدل	Same as (a)	عدل
عدالدولة	only Arabic margins.	عدالدولة
وزين الملة		وزين الملة
عبد الرشيد		ابو منصور
margin of elongated		عبد الرشيد
pear shaped dots.		Arabic margin.

A variety of (a) has instead of **عدل** the word **فتح**. A second variety of the same type has **ع**. A third type has a flower with a dot on each side of it. Of (a) were 5, of (b) 13, of (c) 8. Thomas marks (a) as "*unique, my cabinet.*" But his has not the word **adl** on it, only a dash to indicate its absence.

The coins of *Farrukhzád* were of one type only, and the varieties were those of execution rather than of inscriptions. They had a bull on the reverse as usual. The obverse was occupied by an inscription with dotted margin.

عدل
جمال الدولة
ابو شجاع
فرخ زاد

A variety has فتح instead of عدل

The coins of *Ibrahím* were of two types only. Bull reverse. Obverse inscriptions in areas and on margins.

(a)	عدل	(b)	عدل
(49 of this	نصير الدولة	(50 of this	السلطان
type.)	و ظهير الملة	type.)	المعظم
	ابراهيم		ابو المظفر
			ابراهيم
	لوهور		لوهور

Besides these there were great quantities of coins of the ordinary bull and horseman type without any Arabic inscription on them. The find was interesting as showing that these five sovereigns had more or less a hold on Lahore and therefore on the Panjab. Old coins of the different types were perhaps known before. But this find has revealed some new types and has given duplicates of previously esteemed unique ones.

The coins were all of silver and copper. Some however seemed to have more silver in them than copper. Dr. Stülpnagel, W. Theobald, Esq., Dav. Ross, Esq. and myself have secured a few of the best. The rest, about five hundred, will of course find their way to the smelting pot.

4. *On the Coins of the Sikhs.*—By C. J. RODGERS, Principal, Normal College, Amritsar.

(Abstract).

In this paper the author reviews the history of the Sikhs from the time of *Nának* to the battle of Gujrat, illustrating the later portion of that history by the help of the coins struck by the later Sikh leaders. "It was during the temporary occupation of Lahore by the Sikhs, about 1757, that the first Sikh rupee is said to have been struck by Jassá Singh Kallál." But this appears to be doubtful. The first undoubted Sikh rupees were struck in 1764 in Lahore and were called *Gobind Sháhi*, not *Nának Sháhi*, as sometimes stated. The first *Nának Sháhi* rupees date from 1778. The first rupees issued by Ranjit Singh are of 1800

(i. e. 1857 Samvat). "But they do not contain his name. Ranjit Singh put his name on nothing, gave his name to nothing. The fort he built at Amritsar is called Gobind Garh, the garden he made there, Rám Bágh." After the accession of Ranjit Singh rupees were struck regularly every year at Amritsar and Lahore, and after the conquest of Multán, also at the latter place. For some years his rupees show on the obverse, what looks like a double branch. This is supposed to represent a peacock's tail. These coins are known as *Morá Sháhi* rupees amongst the bankers; and they are said to have been struck by Ranjit Singh, to gratify the desire of a favourite dancing-girl of his, who wished to have her name placed on his rupees. Another curious rupee of Ranjit Singh was struck at Lahore in 1836 (= Samvat 1893). The reverse has two figures on it, Nának and his Muhammadan fellow-wanderer Mardáná. It is the only one of the kind that Mr. Rodgers says he has seen. Another peculiarity is that all rupees struck after Samvat 1884 (A. D. 1827) and up to 1906 retain the date 1884 or 1885 on the reverse, while the real date is given on the obverse. This is explained by a superstitious notion of Ranjit Singh, that he would thereby prolong the number of the years of his life. The inscriptions on the Sikh coins are either in Persian or in Gurmukhí.

This paper will be published in the Journal, Part I.

5. *Notes on the Inhabitants of the Nicobars.*—By F. A. DE RŒPSTORFF, cand. philos. F. R. Danish S. Antiquaries, C. M. R. Dan. G. S. and of the Berlin S. for Anthropol., Ethnol. and Antiquaries, &c.

In the Proceedings of the Asiatic Society for July 1876 will be found a report on the inland tribe of Great Nicobar* in which I called attention to this tribe, and quoted what was authentically known about them. I mentioned the visit paid to a remote, and for the time being, deserted village on the Galathea† river by the members of the Danish expedition, and I quoted the description *in extenso*. I then described a visit I paid to the Ganges harbour‡ where I saw a man and two boys belonging to the inland tribe, in whom I failed to see any trace of Negrito or Papuan origin, from which I concluded that the tribe living on the North end of the island is not of such origin as has been supposed. There were at the time sufficient facts to connect him with the Galathea village. His cooking-pot I saw: it was formed (like the one in the Galathea village) of a sheet of bark, and as it was standing on the fire-place with the remains of his last meal, there was no mistake about it. He also produced the same sort of spear

* The largest and most southern of the Nicobar Islands.

† Running out into the south bay of the Island.

‡ Near the north-west point of Great Nicobar.

as that found south, and also the same bark-made cloth. His height was 5 ft. 8½ in., which showed clearly that no "ito" could be added to his name. From 1876 until the present day, I have always wished to make further enquiries into the question, because I found that the different tribes were described very differently by the Nancowry men who had seen them or had heard of them.

When the settlement at Nancowry was opened in 1870, Okpank (Capt. Johnson), a Nancowry man, went on a visit to Calcutta. On returning he stayed some time at Port Blair with Major Protheroe, and when he saw an Andamanese for the first time, he at once said to Major Protheroe in Malay, that the Andamanese was like a tribe that lived in the interior of Shambelong (Great Nicobar), and seemed afraid of him. Since that time parties of Andamanese have at different times been at Nancowry, but the people there now deny that they resemble at all the Great Nicobar inland tribe. Yet that Okpank who is a sharp observer, should have shown such a fright on seeing the Andamanese seems very peculiar, for it could not have been acting on his part, as he did not know that we had any knowledge of the Shom-Bengs of Great Nicobar, or that he had seen them. To me it seemed probable, that there was some resemblance which at first sight reminded him of them, but which on nearer acquaintance might not be so very striking.

Since then the theory of an *inland* tribe in the Andamans has been completely explored and exploded, for several expeditions have been made, and the unknown tribes, so called, are found to be a few migratory clusters of men with free access to the sea, and occupying the seacoast and creeks without making any attempt at cultivation. No boats of any description have been found, and in their camping places no sea shells of salt-water-food were seen, but this does not preclude, in my opinion, other encampments existing where such and other produce of the sea would be found.

On the 26th October last, I again started to Great Nicobar. The plan was to go to Pulo Milo, and to take one man and a little canoe on board to land in. On the morning of the 27th we, however, found ourselves set too easterly, so we proceeded straight to Galathea Bay. The weather was very boisterous and we could not effect a landing, and the morning of the 29th found us again at the N. E. end of Great Nicobar. It was now our intention to anchor off Pulo Condul, and I would from thence have made an attempt to get to their villages by the help of my friends at Condul, but a canoe that came off warned us, that there had been ten deaths among the little population of Condul (Lamongshe), and that all the inhabitants had fled.

The two men that had come off said that we should be able to meet Shom-Bengs not very far off, and they showed us a good anchorage off the village Laful (Trinent). This village lies about four or five miles south of the N. E. Point of Great Nicobar. The wind died away, and we had to anchor

some two miles off. We had brought a Nicobar man from Camorta, and after describing to him what we wanted to do, he was allowed to go ashore with the two who had come off, and who were engaged as our guides.

In the cool of the evening some of the ship's officers and I landed at the village. It consists of 7 or 8 houses, and lies to the north of a creek. Our Camorta guide met us on landing, helplessly drunk; he was boisterous and tried to contradict and counteract us in everything. We found the whole village in mourning, and outside the first house we entered we found the usual sacrifices to the spirits, consisting of cocoanut shells, pandanus bread, troughs and other things belonging to women, which were broken, cut up, and destroyed, which indicated that the sacrifice was for a woman, and so it was, for a woman had died while the men were out at our ship. There she lay still and peaceful, as if she were sleeping. Friends and relatives had assembled and brought gifts of cloth, which were stacked up beside her; they put silver bangles on her feet and arms. They were very quiet, but their grief did not however, prevent them from being curious as to what we wanted, what we had brought with us, and what we were going to take away. They were rather disappointed at my assuring them that our visit was solely intended to open out communications with the Shom-Bengs (or Pengs). They all assured me that they were in this neighbourhood, and the two men who came off in the morning promised to go up with us, and so also did a woman and her husband who knew them well.

While we were in the village the corpse was moved to a larger house and the crying over the dead commenced. Although they all were very much concerned in the mourning, I must say, that they were very hospitable. We were offered seats and young cocoanuts, and some men and women remained to entertain us. The whole place was however as if quite taken up with the dead, and I was heartily glad to get on board again.

A restless fever night made me rather doubtful whether I could undertake the expedition in the morning. Captain Simpson, of the "*Constance*," kindly offered to come with me, and, with some refreshments packed up, a dry suit, and a bag with presents, we started. At daybreak we landed at Laful. No one was to be seen, but after a while our Camorta man turned up, sober and very sorry (so he said) for his behaviour over night. I warned him that if he would make that good, he must get hold of our second guide (one I had kept on board during the night), and in a few minutes we were off. We entered the creek, and as there is a surf the canoe was sent round first. Just inside the surf we got in and, with three Nicobarese to paddle, started. No scenery can compare as far as I have seen the world, with the luxuriance, beauty and solemnity of the creeks in these islands. They are generally land-locked and the most absolute silence reigns. The light-green mangrove with its many roots in the salt and

brackish water, the Dhunny palm, pandanus, rotangs, and, now and then where higher land skirts the water, foliaceous trees, together with reed-like plants, creepers, and orchids, all pass in succession before the eyes, all graceful forms, which seemingly pour out of the grim muddy soil, so that it is like a fairy land to those who visit it for the first time. In this creek the formation was, however, past the mangrove stage, and only a few of these trees appeared every now and then. At one place a ficus had thrown a root right across a branch of the creek, and had formed almost like a wall. We shot past it, and after a journey of about a mile and a half we landed. An oar was stuck in the mud inside the enclosure made by the outrigger, and the canoe was left. We then proceeded across a large piece of alluvial soil covered with fine grass (not the Savanna Lalang of Camorta), with pandanus and cocconut plantations. We passed through a village and our guides left their dhaos (heavy Burmese knives some 12 to 18 inches long) in one of the houses. After a while, we struck into the same stream which had carried our boat. It was now no longer fit for canoes, it was rather broad, and ran between boulders with turnings right and left. On the whole we could see by the sun that it kept about the direction west, a little southerly. Occasionally we scrambled out of the stream, and found our way near its side or over some flat short cut of its windings. On one of these we came across a rattan put in the ground like an arch about 5 feet 8 inches high. One of our guides pointed to it, and said it was some joke (*miloe*) of the Shom-Bengs.

Again a little further on, one of the guides pointed out to me a dhao stuck in a tree, and almost immediately after we came upon a cleared spot. The trees had been felled and the undergrowth cleared away, but it was again nearly covered with secondary growth. In it there were some plantain trees carefully planted out, the young ones hedged in, and 4 Shom-Beng huts. The three huts were evidently intended for habitation, and the fourth either for cooking purposes or for a storehouse; the latter was only 3½ feet raised from the ground, and was covered with rotangleares. The three houses were 6 feet in length by 4 feet in breadth. They consisted of sticks, 2 or 3 inches thick, in the ground tied together with rattan. About 3 feet from the ground was a platform with overlaying cloven thin stems of some palm, the flat surface uppermost. The roof consisted of 5 or 6 pieces of bark laid across the ridgestick and resting on thick rotangs. These huts stood N. and S. and the ends were open. I might compare them to rough six-posted bedsteads made for a night's rest by travellers on a journey, they certainly could not contain more than a couple each. On the ground round the huts were the remains of their meals. The most notable were some navicellæ and other freshwater and landshells, and the worked out scales of the pandanus trees, which show that they have learnt the secret of making larome (*i. e.*, pan-

danus bread) from the Coast people. I would not suggest that this pandanus bread had been made by Coast-women on a visit because it is a very slow process. The layer of these shells and husks was so thin that it showed that this clearing was not old, for their meals had not got time to grow into a Kiöckenmiödding.

The rain then began pouring down violently and the guides were anxious to return. I showed them, however, what they might expect if we actually came across the people, and as they could not withstand the promise of possessing a couple of plated spoons, they decided that they would find them.

As the rain was heavy the guides left our dry clothes in one of the Shom-Beng houses, a sign, it seemed to me, that property is pretty safe with these people. We then started, and now our guides were very energetic. The road led us up the stream we had hitherto ascended, and it was a desperate scrambling over big, slippery stones, through waterpools, now and then along the sides of the streams. The natives with their naked feet felt none of the inconvenience we did. One guide disappeared ahead, and it was with great trouble we kept the others with our party.

The sun was pretty high when we came to a shady nook where we were to commence climbing the hills. I now resisted and said that the guides must go on, and that we would await their return as it seemed to me useless to go any further, if we were not sure of coming across the people. We only kept the Nancowry man with us. The stream made a turn at this place and formed a big pool. The west side of the stream was bordered by a precipitous cliff, and on our side a few flat rocks gave us a resting-place. The same abundance of vegetation as at the Andamans presented itself on all sides. Trees were growing immediately on the rock, between them was a dense undergrowth of rattans and other palms; up the trunks of the trees were ferns growing, and the tops were interwoven with creepers. Green leaves in every shade from the faded ones that the current carried away past us to the finest light-green were to be seen, but there were no flowers visible. The shade where we lay was complete and cool, and the steadily falling rain helped to keep us from feeling the sun. I noticed that not one little fish nor a shrimp made its appearance and the Nancowry man showed us the artificial stone settings of the Shom-Bengs all along, and said that the stream was well worked by them, and that whenever the rain was not too heavy they scoured it of everything eatable. As the rain became heavier we retreated under the lee of a big tree sitting on the rock under its roots, and were beginning after an hour's waiting to feel rather cool. Suddenly the scene changed. To our left was half hidden to us the spot where our guides had disappeared.

We heard a shout and found that the two guides were there and a Shom-Beng with them. It was the latter who had shouted. He had a spear in his hand and seemed very much afraid, but after a little talk he threw his spear down, and came at once up to me and seated himself quite close, nearly hugging me. One look at him sufficed to assure me that I had now come across a specimen of a curly-haired race, Papuan or Negrito. His hair was bushy and with rather a bend, and was very abundant. It covered the whole surface of his head and was not like the hair of an Andaman Negrito, of the Papuan of New Guinea or of the Negro found in tufts or patches. It had, however, the Papuan quality of being long, longer than the hair of the Andamanese ever is. This hair was, or appeared to be, brownish, interspersed with white, was very coarse and stiff, and gave an exaggerated appearance of size to his head. I beg to enclose a lock of his hair for the examination of the Society. His face was pleasant, especially when smiling, his forehead was high, his eyes were black, his nose well formed and arched, his upper lip was remarkably prominent from the base, his underlip small, his teeth were black but of natural size.* One tooth was loose, but he could not be prevailed on to part with it. His colour was copper-brown and a shade fairer than our Great Nicobar and Camorta guides. His complexion did not at all remind me of the deep shining black of the Andaman Negrito. His name was Koal. He had his private parts tied up, but in such a loose way, that it was evident that the Coast people are right when they assert that the male Shom-Bengs go quite naked in their own haunts.

I asked to be allowed to go to his place, but he begged of us not to do so, as his wife and three children would be frightened; he promised, however, that if we would return, he would in the evening follow us to a certain house of the Coast people with his wife and children. As I had got the main point settled, namely, that there is a curly-haired race in the island, we came to terms. He allowed me to cut off some of his hair with a curious grin. The spear he brought with him had a handle with an iron spike; he gave it me and on it I cut a notch for his height. His height was 5 ft. 3½ in. (English measure).

Half a bundle of tobacco made him very happy and I gave him some handkerchiefs for his wife. We parted on good terms and he said that he would towards evening come with his family and bring presents for me. He promised to bring me their spears, some of their bark-made cloth (*celtis*? bark) and some produce of his garden.

We then went back. The rain had swollen the stream, and where we had before gone dry shod, we had now to go in water, but the satisfaction of having succeeded in seeing a typical specimen of this curious people made

* The Coast people have their teeth very much enlarged, see the latter part of this paper.

the road easy. When we reached the deserted Shom-Beng village we were very glad to turn into their houses, Mr. Simpson in one and I in another. The rain was pouring down very heavily, but the house I was in was perfectly dry. From the sheltered position of the village and the direction of the houses, the rain very rarely would beat in heavily. The shelter we gratefully acknowledged, and we faithfully shared our breakfast with the guides, who stared at every mouthful we took. Our claret they scorned; they do not appreciate anything between water and arrack.

We reached the hut that was appointed as our meeting place, and having sent on our guides to bring clothes and food, we made ourselves comfortable in the house which was deserted at the time. At about 5 p. m. the Shom-Beng turned up. By this time the house was full of people. He looked quite a different man. In the morning he had a pleasant expression full of smiles, perhaps he was also a good deal excited. Now he looked fagged and tired, and he had also reason to be so. He brought two enormous bundles of plantains as well as three spears. When I in the morning asked him for something from his garden I meant some rootfruits, not plantains, but I forgot to say so. I wanted to see whether he cultivated like the Shom-Beng I met in 1876. The spears he brought were the same wooden spears that the Galathea expedition obtained in the deserted village, and the same as those I obtained in Ganges harbour in 1876, so that I had there a link that connected the three tribes. He said his wife was unwell and could not come, but he promised me that if I would return another time she would come down. After some pretty speeches on both sides and counter-presents on my side we parted. I beg to forward with this paper a specimen of Koal's (the Shom-Beng's) hair, and hair of two Andamanese lads from the neighbourhood of Port Blair, also one of the spears he brought me, which is the typical Shom-Beng spear without any attached spear-head. It will on examination be seen how very different the samples of hair forwarded are in structure and colour.

On talking with the Coast people about his hair I mentioned to them, that at the Ganges harbour I had met a different sort of man, tall, and with smooth hair, and they at once said: "Yes this is a bad Shom-Beng, there are others, but far away, that have hair like us and that look like us, he is a bad specimen."

As the result of my visit I conclude that there is an element of Papuan origin in the island, that it is only found among the people living inland (i. e., cut off from the sea and communication with the outer world) and that this element is strongly mixed with another not curly-haired race. What the proportion is I cannot say, but the assertion I have so often read, but never seen confirmed by actual evidence, about a curly-haired race in the interior of Great Nicobar is true. Whether the

Andaman Negrito and this tribe are related is very doubtful. The intermixture with another element may have been so strong that only a trace remains of the origin. My opinion is that it is a Papuan and not a Negrito tribe, but I hope by further investigations to settle this matter.

The people of the Nicobars have all black teeth, owing to the chavica leaf which is chewed together with areca nut and quick shell-lime. The teeth of the natives are however, in the islands of Camorta, Nancowry, Trinkut, Katchall, Great and Little Nicobar, often of an enormous size. A very similar case is reported by Mr. v. Mikludo-Maclay who in the Admiralty Islands found a big-toothed people. His paper is interesting, and it is carefully illustrated.*

Mr. v. Mikludo-Maclay shows in his illustrations enlarged teeth, mostly of the upper jaw, but he says expressly, "Häufiger waren es die Schneidezähne des Oberkiefers, die vergrößert waren, aber auch nicht selten zeigten die des Unterkiefers dieselbe Eigenthümlichkeit."

With the Nicobarese, I find the teeth of the lower jaw more commonly enlarged. Mr. v. Mikludo-Maclay states that these enormous teeth serve as "chewing plates" (*kauplatten*) and in every word of his description it suits the Nicobarese except in the one that they are a mixed-Malay tribe and the Admiralty-Islanders Melanesians. The teeth of the Nicobarese are white till they begin to eat chavica at the age of six or seven or even before. The enormous development of the teeth begins to show in middle age. They chew quick shell-lime with their areca and chavica, and this produces the phenomenon. Mr. v. Mikludo-Maclay, could not make a collection of their teeth as they would not submit to have them pulled out. Owing to the lucky circumstance that the Nicobarese keep the big teeth they lose, I have been able to make a collection, part of which I beg to present to the Society. Owing to the enormous growth of their teeth the lips in many persons never meet for years till the last big tooth is lost.

I beg to draw attention to the curious fact that the Nancowry people have wild pigs domesticated. I often wondered why the little pigs born in the villages were striped and marked like the litter of wild sows. This is the explanation. All male pigs that are born in the villages are without fail castrated and the sows are well fed. At night fall all the pigs assemble under the house they belong to and are fed by the woman of the house, but during the day they roam in the jungle. It is during these rambles that they meet the wild boars who are fathers to all the litters in the villages. Although instances have happened that a few pigs have been introduced, this is so rare, that it may be said that it is the wild pig of the Nicobars that lives domesticated.

* Vide Berliner Gesellschaft für Anthropologie, Ethnologie und Urgeschichte; Sitzung von 16 Dec. 1876.

Mr. BALL said:—"I have heard the paper by Mr. de Roepstorff with very great interest as I have always held* in opposition to his formerly expressed views that there was sufficient testimony in favour of the opinion that the interior of the Great Nicobar was inhabited by a race of people totally distinct from those living on the Coast, and who were most probably closely allied to the Andamanese.

"Col. Yule in his 'Marco Polo' and Mr. Distant in a late number of the Anthropological Institute's Journal both state that they had been informed by Col. Mann, late Superintendent of the Nicobar Islands that some Nicobarese on a visit to Port Blair had pointed spontaneously to the Andamanese as being like the inland race of the Great Nicobar. Mr. de Roepstorff says that the so-called Capt. Johnson, a Nicobarese, also saw the same resemblance when he was at Port Blair, though other Nicobarese at Nancowry denied the resemblance.

"The man whom Mr. de Roepstorff describes in this paper under the title Shom-Beng is clearly not closely allied to the Andamanese. His colour and the character of the hair now exhibited prove that; but whether he can really be regarded as a typical example of the inland race is of course open to question. No safe generalisation can be made from the characters of a single individual, the more especially of one who seems to have been on terms of intimacy with the coast people. A number of these people who live shut out from intercourse with the coast people must be examined before any conclusive result can be obtained."

At the close of the meeting the Rev. Mr. Dall read some extracts from a letter describing portions of the work done by the United States Coast Survey officers during the past season.

The following communication has been received:—Notes on Serohi Division, Western Rajputana (S.) Railway, by J. W. Parry, C. E.

LIBRARY.

The following additions have been made to the Library since the meeting held in December last.

TRANSACTIONS, PROCEEDINGS AND JOURNALS,

presented by the respective Societies and Editors.

Berlin. K. preussische Akademie der Wissenschaften,—Monatsbericht, August 1880.

* Vide Jungle life in India, p. 319.

- Bombay. The Indian Antiquary,—Vol. X, Pt. 114, January 1881.
- Bordeaux. Société de Géographie Commerciale,—Bulletin, Nos. 22-23.
- Calcutta. Geological Survey of India,—Memoirs, Vol. II, Pts. I-II.
- Geneva. Museo Civico di Storia Naturale,—Annali, Vol. XV.
- Königsberg. Physikalisch-ökonomische Gesellschaft,—Schriften, 1876-79, and Part I of 1880.
- Leipzig. Deutsche morgenländische Gesellschaft,—Zeitschrift, Vol. XXXIV, Parts 2 and 3, 1880.
- Lisbon. Sociedad de Geographia, Boletín,—Second series, No. 1.
- London. Royal Astronomical Society, Monthly Notices, Vol. XL, No. 9.
- . Royal Microscopical Society,—Journal, Vol. III, No. 5, October 1880.
- . Royal Geographical Society,—Proceedings, Vol. II, No. 11, November 1880.
- . The Linnean Society, Journal, Botany,—Vol. XVII, Nos. 103-105, Vol. XVIII, Nos. 106-107.
- . ————. Zoology,—Vol. XIV, No. 80, Vol. XV, Nos. 81, 82, and 83.
- . ————. Transactions, Botany,—Vol. I, Pts. VII, VIII, and IX.
- . ————. Zoology, Vol. II, Pt. I.
- . ————. List of Fellows,—November 1st 1879.
- . The Royal Society,—Proceedings, Vol. XXXI, No. 206.
- . Anthropological Institute of Great Britain and Ireland,—Journal, Vol. X, No. 1, August 1880.
- . Statistical Society,—Journal, Vol. XLIII, Part 3.
- . The Academy,—Nos. 444 to 449.
- . The Athenæum, Nos. 2768 to 2772.
- . Nature,—Vol. XXII, Nos. 568-569, 572, and Vol. XXIII, Nos. 576-580, and Index to Vol. XXII.
- Moscow. Société Impériale des Naturalistes,—Bulletin, Vol. LV, No. 1, 1880.
- Paris. Journal Asiatique,—Vol. XVI, No. 2, August to September 1880.
- . La Société de Géographie,—Bulletin, Vol. XX, August 1880.
- Pisa. Società Toscana di Scienze Naturali,—Atti, Vol. IV, 2.
- Roma. Società degli Spettroscopisti Italiani,—Memorie, Dispensa 6, 7 and 8, June to August 1880.
- Washington. Smithsonian Institution,—Miscellaneous Collections, Vols. XVI, and XVII.
- . ————. Contributions to Knowledge,—Vol. XXII, Annual Report for 1878.

- Wien. K. K. Central-Anstalt für Meteorologie und Erdmagnetismus,—
Jahrbücher, Vol. XV, Part I; Vol. XVI, Pt. 1.
Yokohama. The Asiatic Society of Japan,—Transactions, Vol. VIII,
Pt. 3.

BOOKS,

presented by the Authors.

- TEMPLE, LIEUT. R. C. An Account of the Country traversed by the Second
Column of the Tal Chotali Field Force in the spring of 1879. With a
map. 8vo. London, 1880.
WHINFIELD, E. H. Gulshan-i-Raz: the Mystic Rose Garden of Sa'd-
ud din Mahmud Shabistari. The Persian Text, with an English Trans-
lation and Notes, chiefly from the Commentary of Muhammad Bin Yahya
Labiji. 4to. London, 1880.

MISCELLANEOUS PRESENTATIONS.

- Annual Report on Inland Emigration for the year 1879-80. Fcp., Cal-
cutta, 1880.
Report on the Administration of the Salt Department for the year 1879-80.
Fcp., Calcutta, 1880.
Annual Report on Emigration from the Port of Calcutta to British and
Foreign Colonies for 1879-80. Fcp., Calcutta, 1880.
General Report of Public Instruction in Bengal. Fcp. Calcutta, 1880.
Indian Forester,—Vol. VI, No. 11, October 1880.

BENGAL GOVT.

- BOSE, P. C. Hindu Matrimony, an Essay written under the explicit
orders of Capt. the Lord William Beresford, V. C., Aide-de Camp to
H. E. the Viceroy. 8vo., Calcutta, 1880.

SURGEON-MAJOR A. F. BRADSHAW.

- WALSINGHAM, LORD. Illustrations of Typical Specimens of Lepidoptera
Heterocera in the collection of the British Museum. Part IV. North-
American *Tortricidæ*. 4to., London, 1879.

BRITISH MUSEUM.

- SEWELL, R. Report on the Amaravati Tope, and excavations on its site
in 1877. 4to., London, 1880.
MÜLLER, F. MAX. Sacred Books of the East,—Vols. IV, V and VII.
DARMESTETER, J. The Vendidad, Part I.
West, E. W. Pahlavi Texts.
JOLLY, J. The Institutes of Vishnu.

HOME DEPT. AND AGRIC. DEPT.

SEWELL, R. Report on the Amarávati Tope, and excavations on its site in 1877. 4to., London, 1880.

MADRAS GOVT.

DUTT, UDAY CHAND. Nidána, a Sanskrit System of Pathology. Translated into Bengali. 8vo., Calcutta, 1880.

DR. R. L. MITRA.

Report on the Administration of the Government of the North-West Provinces and Oudh for the year ending 31st March 1880. 8vo., Allahabad, 1880.

GOVT., N. W. PROVINCES.

Report on the Sanitary Administration of the Panjab for the year 1879. 4to., Lahore, 1880.

PANJAB GOVT.

CORSSEN, W. Ueber die Sprache der Etrusker, 2 Vols. 8vo., Leipzig, 1874-75.

HON. WHITLEY STOKES.

ALLEN, J. A. History of North-American Pinnipeds; a monograph of the Walruses, Sea-Lions, Sea-Bears and Seals of North America. 8vo., Washington, 1880.

DEPT. OF THE INTERIOR, U. S. AMERICA.

CHAMBERS, F. Brief sketch of the Meteorology of the Bombay Presidency in 1879. 8vo., Bombay, 1880.

CHAMBERS, F. Abnormal Variations of Barometric Pressure in the Tropics, and their relation to Sunspots, Rainfall and Famine. Fcp., Bombay, 1880.

METEOR. REPORTER FOR WESTERN INDIA.

PERIODICALS PURCHASED.

Berlin. Journal für reine und angewandte Mathematik,—Vol. XC, No. 2. Calcutta. Indian Medical Gazette,—Vol. XV, No. 12, Dec. 1880.

Geneva. Archives des Sciences Physiques et Naturelles,—Vol. IV, No. 11, November 1880.

Göttingen. Gelehrte Anzeigen,—Nos. 47-51.

———. Nachrichten,—Nos. 17-19.

Leipzig. Annalen der Physik und Chemie,—Vol. XI, No. 3.

———. Beiblätter,—Vol. IV, Nos. 10 and 11.

London. Society of Arts,—Journal, Vol. XXVIII, Nos. 1461-64.

———. Journal of Botany,—Vol. IX, No. 215.

———. Chemical News,—Vol. XLII, Nos. 1094-1098.

———. Entomologist,—Vol. XIII, No. 210.

———. Entomologist's Monthly Magazine,—Vol. XVII, No. 198.

- London. Messenger of Mathematics,—Vol. X, No. 6.
 ———. Annals and Magazine of Natural History,—Vol. VI, No. 35.
 ———. Nineteenth Century,—Vol. VIII, No. 45.
 ———. Numismatic Chronicle,—Vol. XIX, No. 74.
 ———. London, Edinburgh and Dublin Philosophical Magazine;—Vol. X, No. 63.
 ———. Publishers' Circular, Vol. XLIII, Nos. 1036 and 1037.
 ———. The Journal of Science,—Vol. II, No. 83.
 New Haven. American Journal of Science, Vol. XX, No. 118.
 New York. Academy of Sciences, Vol. I, Nos. 1-13.
 ———. Lyceum of Natural History,—Vol. XI, No. 13 (Index and Contents).
 Paris. Annales de Chimie et de Physique, Vol. XXI, November 1880.
 ———. Comptes Rendus,—Vol. XCI, Nos. 18-22.
 ———. Revue Critique, Vol. X, Nos. 45-49.
 Paris. Revue de Linguistique,—Vol. XIII, No. 4.
 ———. Revue des deux Mondes,—Vol. XLII, Nos. 2 and 3.
 ———. Journal des Savants,—November, 1880.
 ———. Revue Scientifique,—Vol. XIX, Nos. 20-24.

BOOKS PURCHASED,

- ALBERTIS, L. M. D'. New Guinea: what I did and what I saw. 2 Vols. 8vo., London, 1880.
 GÜNTHER, DR. A. An Introduction to the Study of Fishes. 8vo., Edinburgh, 1880.
 LEGGE, CAPT. W. V. A History of the Birds of Ceylon, Part III. 4to., London, 1880.
 PISCHEL, RICHARD. Hemacandra's Grammatik der Prakritsprachen (Siddhahemacandram Adhyāya VIII) mit kritischen und erläuternden Anmerkungen, Pt. I. Rl. 8vo., Halle, 1877.
 SWINTON, A. H. Insect Variety: its Propagation and Distribution. 8vo., London.
 WALLACE, A. R. Island Life: or the Phenomena and Causes of Insular Faunas and Floras, including a Revision and attempted Solution of the Problem of Geological Climates. 8vo., London, 1880.
 WARTZ, AD. The Atomic Theory. Translated by E. Cleminshaw. 8m. 8vo., London, 1880.



The publication of the Appendix containing the Annual Accounts is deferred to a subsequent Number.



of the year was thus 355. Of these, 30 are absent from India and pay no subscriptions, 112 are Resident, 184 Non-Resident, 15 Foreign, and 14 Life Members.

The following table shows the fluctuations in the number of Ordinary Members for the past 6 years.

YEAR.	PAYING.				NON-PAYING.		TOTAL.
	Total.	Resident.	Non-resident.	Foreign.	Life.	Absent.	
1875	292	113	179	..	3	50	345
1876	294	119	175	..	5	48	347
1877	290	113	165	14	9	46	345
1878	285	117	153	15	13	29	327
1879	281	111	154	16	12	36	329
1880	311	112	184	15	14	30	355

During the year two members compounded for their future subscriptions, *viz*, Dr. R. A. Barker and Pandit Mohanlal Vishnual Pandia, thus raising the number of Life Members to 14.

The following are the names of the members who died during the year:—Honorary Member, Sir J. W. Colville; Corresponding Member, Rev. M. A. Sherring; Ordinary Members, H. L. Dennys and Thakur Gird Prasad Singh. Of these deceased members whose loss the Society has to regret, Sir J. W. Colville had in former times taken a very active part in the management of the Society's affairs, for he was President for 10 years from 1848 to 1858, besides being on the Council for several years previously. Mr. M. A. Sherring had contributed a paper to the Society in 1870 on the Coins of the Sharqi Kings of Jaunpur, and was well known as the author of the "Sacred City of the Hindus," "Hindu Tribes and Castes," &c.

Indian Museum.

The only presentation made to the Society, and transferred to the Indian Museum, during the year, was the skin and skull of a specimen of *Lagomys rufescens*, from the Safed Koh Range, forwarded to the Society by Dr. J. E. T. Aitchison.

Mr. J. Crawford tendered his resignation as Trustee of the Indian Museum on behalf of the Society in April, and Mr. A. Pedler was appointed in his place.

Dr. A. F. R. Hoernle and Messrs. Tawney and Beverley have acted as Trustees throughout the year, and Dr. T. R. Lewis up to the time of his resignation as member of the Council, in July.

Finance.

The accounts, which will be found in the Appendix, are issued for the first time in a new form. While less voluminous they will be found more complete, as they include the value of the Stock, and show in Statement No. 4 the outstandings, how these have originated, and whether due vigilance has been exercised in getting them in.

It will be seen that the Government grants are not only distinctly accounted for, as required by Government, but they form a portion of a general account. As the Society is strictly liable for these funds, no account of the Society's affairs, proper, could be complete without the incorporation of its liabilities on account of these grants; and if the Society had mismanaged these grants, the fact, that the accounts of them were kept absolutely distinct from those of the Society, would not in any way absolve the Society from its responsibility to Government.

The previous system of keeping an absolutely separate account of each grant and one of the Society's affairs was therefore unnecessary and cumbersome; Statements 4, 7, and 8 are general and state the Society's affairs completely.

The establishment employed, an Accountant and a Cashier, has been reduced to one man only, whereby a saving of about Rs. 30 a month has been effected. The large Cash balance formerly kept has been reduced by the surplus being invested; this has increased the Society's income, at present, by about 450 Rupees a year. The rules prescribe that the investments be kept in two separate funds termed a permanent and a temporary fund. Admission and commutation fees were kept in a separate bank account, and the rules prescribe they be invested as soon as possible after receipt thereof. Trust funds were also kept in separate bank accounts, and the servants' pension fund separately invested.

This complicated way of dealing with these matters is quite unnecessary with complete accounts, and it has the serious objection of introducing complications which hinder clear statements and proper checking of the accounts. Nor does this complication afford any additional security or other advantage. All that is necessary is to keep the Cash balance as low and the investments as high as possible, raise the amount prescribed as a permanent reserve fund as deemed desirable, and if it be desired that commutation and admission fees be added to the permanent reserve, the Council may annually increase the permanent reserve by at least the amount received during the year under these heads. The complete adoption of these suggestions would require some modification of rules 67, 68, 69 and 70.

(For the annual accounts, see Appendix.)

The following is the estimate for income and expenditure for the year 1881.

RECEIPTS.

Subscriptions	...	...	...	Rs. 7,500
Sale of Publications	...	...	...	1,500
Admission Fees	...	...	...	1,000
Commutations	...	...	...	300
Interest	...	...	...	6,000
				<hr/>
				Rs. 16,300

EXPENDITURE.

Salaries	...	...	...	Rs. 4,250
Printing	...	...	...	3,850
Plates	...	...	...	2,460
Books	...	...	...	1,700
Binding	...	...	...	500
Building	...	...	...	300
Pensions	...	...	...	186
Taxes	...	...	...	780
Freight	...	...	...	50
Meeting charges	...	...	...	100
Periodicals purchased locally	...	...	...	60
Lighting	...	...	...	80
Stationery	...	...	...	300
Contingencies	...	...	...	400
Postage	...	...	...	500
Furniture	...	...	...	50
Commission	...	...	...	250
				<hr/>
				Rs. 15,816

London Agency.

Messrs. Trübner and Co.'s account, rendered up to the end of 1879, showed a balance due from the Society of £72-8-3½. The sale of the Society's publications amounted to £62-4-0, and of the Bibliotheca Indica to £40-10-0.

During the year 1880, twenty invoices were received from Messrs. Trübner of books purchased and of publications of different Scientific Societies sent in exchange. The value of the books purchased amounted to £107-12-8.

The number of copies of parts of the *Bibliotheca Indica*, Journal and Proceedings sent to England for sale amounted to 1803. Of the *Bibliotheca Indica* 687 were despatched, of the Journal 832, and of the Proceedings 284.

In consequence of the reduction in the postal rates, the Council have decided in future to send all publications, intended for Societies and Members in Europe, by post instead of through Messrs. Trübner and Co.

Library.

The additions to the Library numbered 1619 volumes or parts of volumes; 784 of which are presentations and 835 purchases.

The Council have much pleasure in announcing that the manuscript Catalogue of the books in the Library is now ready, and that arrangements are being made for printing it. In last year's report it was stated that the Assistant Secretary had done about one fourth of the work of revision. As the Council found that, owing to the pressure of current work, the Assistant Secretary could give but little of his time to the Catalogue, arrangements were made with Mr. Dreyer of the Indian Museum to complete it for Rs. 600.

Copies will be supplied gratis to members and to the Societies with whom the Society exchanges publications.

The Library itself has been put into better order, and four new book cases have been purchased for Rs. 1000.

The state of the Oriental Department of the Library has been investigated by a special Committee appointed for the purpose, consisting of C. H. Tawney, Esq., Dr. R. L. Mitra, Major H. S. Jarrett, Babu P. C. Ghosha, the President and the Secretaries.

A Pandit and a Munshi have been engaged temporally on Rs. 35 a month each, to catalogue and arrange the books and MSS., so as to make this Department of the Library more accessible to members than it has hitherto been.

Publications.

Four numbers of Part I of the Journal have been published during the year, consisting of 218 pages, with 22 plates and two maps; also the 4th number of this part for 1879, consisting of 43 pages, with 12 plates.

An extra number of this part of the Journal has also been published, being a Turki Vocabulary by the late Mr. R. B. Shaw with an appendix by Dr. J. Scully giving a list of Turki names of Birds and Plants. This number consists of 226 pages.

Three numbers of the second part of the Journal have been published comprising 180 pages of letter press and 11 plates; and the 4th number completing the Volume, is to be issued in a few days. No number 4 of this part for 1879 was published.

Of the Proceedings, 10 numbers have been issued, amounting to 211 pages with 10 plates.

The stock of the Society's publications and of the works belonging to the Bibliotheca Indica Series has been taken. This has been a very troublesome and heavy work as it has not been attempted for years, and the parts of the different books had to be sorted and arranged before the number of copies of each could be ascertained. The stock in the Society's possession has been shown to be much greater than anticipated, and several copies of old works, which were thought to be completely out of stock, have been brought to light. A new list of books for sale will shortly be printed. The stock amounts to about 2,05,700 separate numbers or fasciuli, representing about 162 different works or volumes of the Journal, Proceedings, &c.

Building.

The amount spent on repairs during the year was Rs. 343-4-0. Four beams had to be changed at a cost of Rs. 112, and Rs. 55 were spent by the Society in substituting 4 iron pillars for the stone ones formerly supporting the staircase.

Coin Cabinet.

There has been a very large number of additions during the year under review; altogether 247. Only four among these, however, were purchased; the remainder, 243 were presentations.

The four coins which were purchased are gold mohurs, one of Jalal-ud-din Feroz Shah bin Tughlaq. They were obtained from the Magistrate of Budaon under the Treasure Trove Act.

Among the presentations there are four silver (one of Ala-ud-din Muhammad Shah, the others illegible) and 29 copper coins from Lieut. R. C. Temple, B. S. C., found at a village called Holawali. Also ten gold Viraraya Fanams, part of a Treasure Trove discovered in the Chingleput District, and 200 small lead coins, found in the village of Narsaraopet, from the Madras Government.

Secretary's Office.

Dr. A. F. R. Hoernle, and Mr. J. Wood-Mason have held the posts of Philological and Natural History Secretaries, respectively, throughout the year.

Mr. J. Crawford resigned the General Secretaryship in April, and Mr. A. Pedler was appointed in his place.

Mr. Beverley resigned the Treasurership in April, and was succeeded by Mr. J. C. Douglas.

Mr. W. A. Bion has continued to hold the post of Assistant Secretary, and has given much satisfaction by the diligent and zealous discharge of

his duties. Mr. E. S. Andrews has held the post of Assistant Librarian and has also given satisfaction.

During the year the establishment has been reduced by two men. The services of Babus Kedarnath Bysack, Cashier, and Jogendranath Mitra, Store-keeper, were dispensed with; the former appointment being given to Babu Ram Jivana Mukerjea, the Assistant Cashier, and the posts of Assistant Cashier and Store-keeper were abolished. After the dismissal of the old Cashier, Babu Ram Jivana Mukerjea, his successor, worked for some months under the direct supervision of Mr. Douglas, the Treasurer. During this time the office was virtually without a Cashier, most of the Cashier's work being done by the Assistant Secretary. Notwithstanding this additional work and the reduction in the establishment, the Assistant Secretary and his assistants have done much in putting the Library, the Records, &c. of the Society into better order.

To put the stock and the accounts into proper order, two temporary hands have been employed, who have now finished taking stock of and arranging the Society's and the Bibliotheca Indica publications. A Babu has also been engaged temporarily in indexing the old records of the Society so as to facilitate reference to them.

Bibliotheca Indica.

In the two Series together twenty-three fasciculi were published during the year; eight in the Persian and fifteen in the Sanskrit. They belong to eleven different works, of which two in the Sanskrit Series, have been completed and three, two in the Sanskrit, and one in the Persian Series, have been commenced. The former are the *Bhamati*, and the *Gobhiliya Sūtra*; the latter are the *Kathā Sarit Sāgara*, the *Prākṛita Lakṣhaṇa*, and the *Tarīkh ul Khulfa*.

Among these publications, there are four English translations; the remaining seven are text editions. The former are the translations of the *Tabaqāt-i-Nāṣirī*, and of the *Tarīkh-ul-Khulfa*, both in the Persian Series; and of the *Kathā Sarit Sāgara* and the *Prithi Rāj Rāsau*, both in the Sanskrit Series. Of the text editions, one belongs to the Persian and six belong to the Sanskrit Series.

A. Persian Series.

1. Of the *ISĀBAH* or Biographical Dictionary of persons that knew Muhammad, by Ibn Hajar, one fasciculus has been issued by Moulvie Abdul Hai, Head Professor of the Calcutta Madrassah, after an interruption of three years.

2. Major H. G. Raverty has brought out two fasciculi of his annotated English translation of the *TABAQĀT-I-NĀSIRĪ*. There is yet one more fasciculus remaining, which will complete this valuable work.

3. Major H. S. Jarrett has published five fasciculi of his annotated English translation of the *TARÍKH-UL-KHULFA* or the History of the Caliphs by Jaláluddín As Suyúti.

B. Sanskrit Series.

4. Paṇḍit Bála Śāstrī of the Benares College has issued the eighth fasciculus of the *BHAMATI*, which is a gloss on Śankara Āchārya's commentary on the *Brahma Sūtras* by Vāchaspati Miśra. This concludes the work.

5. Paṇḍit Chandra Kānta Tarkálankāra has published the twelfth fasciculus of the *GOBHILĪYA GRĪHYA SŪTRA* accompanied by a commentary compiled by himself. This work also is now completed.

6. Dr. Rājendralāla Mitra has brought out three fasciculi of the *VAYU PURĀṆA*. This is a sort of Cyclopædia of Sanskrit Literature, and is the second of that class of works for the publication of which the Society is indebted to the learned Editor. The other is the *Agni Purāṇa*, the most ancient and most authentic of that kind of Sanskrit books, the edition of which was completed last year.

7. The text of the *MĪMĀNSĀ DARŚANA* which is edited by Paṇḍit Moheśachandra Nyāyaratna, the Principal of the Sanskrit College, has been advanced by one fasciculus. This work is a critical commentary on the ritual of the Veda accompanied by the commentary of Śavara Svāmin.

8. Of the *PRĀKRITA LAKṢHAṆA* the first fasciculus has been issued by Dr. A. F. Rudolf Hoernle. It contains the text of a Grammar of the ancient Prākṛit by Chanda, together with a critical Introduction and Analysis. Another fasciculus, containing an annotated English translation, will complete the work.

9. By the same editor the first fasciculus has been published of his annotated English translation of the *PRITHI RĀJA RĀSAU*, the famous epic of Chand Bardāi in old Hindi.

10. Among the works, the forthcoming publication of which was announced in the Annual Report of last year, is the English translation with notes of the *KATHĀ SARIT SĀGARA*, or the Ocean of the Streams of Story, by Mr. C. H. Tawney, M. A., Principal of the Presidency College. The first volume consisting of six fasciculi has now been published. A second volume completing the work, will probably appear in the course of the current year. This work is the celebrated repository of Indian legends which was composed from older sources by Somadeva of Kashmir towards the close of the eleventh century. The stories are illustrated by notes which refer to similar legends current in other collections of folklore.

11. Another of the new publications is the *NIRUKTA*, the well known glossarial explanation of obscure Vedic terms, of which Paṇḍit Satyavrata Sāmaśramī has issued the first fasciculus, accompanying the text with extracts from various commentaries.

Besides the above named eleven works, there are in course of preparation the following new ones :

1. The *VISHṆU SMṚITI*, by Professor Jolly of Würzburg, containing the text and extracts from various commentaries.

2. The *ĀPASTAMBA ŚRAUTA SŪTRA*, by Professor R. Garbe of Königsberg, containing the text accompanied by the commentary of Rudradatta. This is a very rare and important work connected with the Black Yajur Veda. The edition will be based on a collation of two or three complete and several fragmentary manuscripts.

3. An English translation, with notes, of the *CHARAKA*, the oldest Hindu work on medicine, by Dr. Mohendralāla Sarkār.

4. An English translation, with notes, of the *LALITA VISTĀRA*, by Dr. Rājendralāla Mitra, to whom the Society is already indebted for a complete edition of the text of that most ancient and important work on the earlier portion of the life of Buddha.

5. The *YOGA SŪTRA* of Patanjali by Dr. Rājendralāla Mitra, with the commentary of Bhoja Rājā, and an English translation of both the text and commentary ; also with an English commentary compiled by the Editor himself, including short extracts from the commentaries of Vyāsa, Vijñāna Bhikshu and Vāchaspati Miśra. This work will complete the Society's series of the six Darśanas. The texts of four have been already published ; the *Mīmāṃsā* is in a forward state, and the *Yoga* will complete the series.

6. The *BRIHADDEVATĀ*, by Dr. Rājendralāla Mitra. This is a very interesting metrical work of Saunaka on the deities invoked in the hymns of the Ṛig Veda. The edition will be founded on five MSS.

On the other hand, the *MAITRĀYAṆI SAMHITĀ*, the forthcoming publication of which, by Dr. L. v. Schroeder, was announced in the annual report of last year has, with the permission of the Society, been withdrawn from the list of the *Bibliotheca Indica* by the editor, who intends to publish it in Germany.

Also the *MAGHĀZĪ EL WĀQIDĪ*, the edition of which was begun by Von Kremer many years ago and was to have been completed by Mr. C. J. Lyall, in conjunction with Dr. Wright of Cambridge (see Proceedings, May 1880, p. 88), has been withdrawn from the *Bibliotheca Indica* in favour of a complete edition of the work which is to be brought out in Germany and will be founded, among others, on two complete and very ancient MSS. in the British Museum.

The following is a detailed list of the publications issued during 1880 :

Persian Series.

1. ISÁBAH, edited by Moulvie Abdul Hai, of the Calcutta Madrassah, No. 242, Fasc. XVIII (old series).
2. TABAQÁT-I-NÁŠIRÍ, by Abú 'Umr-i-'Ugmán, translated by Major H. G. Raverty, Nos. 392, 393, Fasc. XI and XII.
3. TARÍKH-UL-KHULFA, or, History of the Caliphs, translated by Major H. S. Jarrett, Nos. 440, 441, 443, 446, 451, Fasc. I to V.

Sanskrit Series.

4. BHAMATI, a Gloss on Śankara Achárya's Commentary on the Brahma Sūtras by Váchaspati Miśra, edited by Paṇḍit Bála Śástrí, No. 433, Fasc. VIII.
5. GOBHILÍYA GRÍHYA SÚTRA, with a Commentary by the editor, edited by Chandra Kánta Tarkálankára, No. 448, Fasc. XII.
6. VAYU PURÁṆA, a system of Hindu Mythology and tradition, edited by Dr. Rájendralála Mitra, C. I. E., Nos. 434, 437, 445 ; Fasc. IV, V and VI.
7. MÍMÁMSÁ DARŚANA, with the Commentary of Śavara Svámin, edited by Paṇḍit Moheśa Chandra Nyayaratna, No. 435, Fasc. XV.
8. PRÁKRITA LAKSHAṆA, or Chanḍa's Grammar of the Ancient Prákrit, edited by Dr. A. F. Rudolf Hoernle, No. 447, Fasc. I.
9. PRITHIRÁJ RÁSAU, of Chand Bardái, translated from the old Hindi, by Dr. A. F. Rudolf Hoernle, No. 452, Fasc. I.
10. KATHÁ SARIT SÁGARA, or, Ocean of the Streams of Story, translated from the Sanskrit by C. H. Tawney, M. A., Nos. 436, 438, 439, 442, 444, 450, Vol. I, Fasc. I—VI.
11. SADBHÁSHYAVRITTI NIRUKTA, with commentaries, edited by Paṇḍit Satyavrata Sámasramí, No. 449, Fasc. I.

List of Societies and Institutions with which Exchanges of Publications have been made during 1880.

- Amsterdam :—Royal Zoological Society.
 Batavia :—Batavian Society of Arts and Sciences.
 Berlin :—Royal Academy.
 Berne :—Swiss Entomological Society.
 Bombay :—Bombay Branch, Royal Asiatic Society.
 — :—Editor, Indian Antiquary.
 Boston :—Natural History Society.
 Bordeaux :—Bordeaux Academy.
 — :—Linnean Society.

- Buenos Ayres :—Public Museum.
 Brussels :—Royal Academy of Sciences.
 ——— :—Geological Society of Belgium.
 Calcutta :—Agricultural and Horticultural Society of India.
 ——— :—Geological Survey of India.
 Cassel :—Natural History Society.
 Cherbourg :—National Society of Natural Science.
 Christiana :—University Library.
 Copenhagen :—Royal Society of Northern Antiquaries.
 Cambridge :—University Library.
 Colombo :—Royal Asiatic Society, Ceylon Branch.
 California :—Californian Academy of Arts and Sciences.
 Dehra-Dun :—Great Trigonometrical Survey.
 Dublin :—Royal Dublin Society.
 ——— :—Royal Irish Academy.
 Edinburgh :—Royal Society.
 Geneva :—Physical and Natural History Society.
 Genoa :—Museum of Natural History.
 Königsberg :—Physical and Economical Institution.
 Leipzig :—German Oriental Society.
 Leyden :—Royal Herbarium.
 Liège :—Royal Society of Sciences.
 London :—Royal Society.
 ——— :—British Museum.
 ——— :—Royal Asiatic Society of Great Britain and Ireland.
 ——— :—Royal Institution.
 ——— :—Institution of Civil Engineers.
 ——— :—Institution of Mechanical Engineers.
 ——— :—Royal Geographical Society.
 ——— :—Zoological Society.
 ——— :—Statistical Society.
 ——— :—Geological Society.
 ——— :—Linnean Society.
 ——— :—Anthropological Institute.
 ——— :—Royal Astronomical Society.
 ——— :—Royal Microscopical Society.
 ——— :—Editor, Academy.
 ——— :—Editor, Athenæum.
 ——— :—Editor, Nature.
 ——— :—Society of Telegraph Engineers.
 Lyon :—Agricultural Society.
 ——— :—Natural History Society.

- Lyon :—Museum of Natural History.
 Madras :—Literary Society.
 Manchester :—Literary and Philosophical Society.
 Moscow :—Société des Naturalistes.
 Munich :—Royal Academy.
 Netherlands :—Royal Society.
 New Haven, U. S. :—Connecticut Academy of Arts and Sciences.
 New South Wales :—Royal Society.
 Oxford :—Bodleian Library.
 Paris :—Imperial Library.
 — :—Anthropological Society.
 — :—Asiatic Society.
 Paris :—Geographical Society.
 — :—Zoological Society.
 Philadelphia :—Academy of Natural Science.
 Pisa :—Tuscan Society of Natural Sciences.
 Simla :—United Service Institution of India.
 Stettin :—Entomological Society.
 Stuttgart :—Natural History Society of Württemberg.
 St. Petersburg :—Imperial Library.
 — :—Imperial Russian Geographical Society.
 — :—Imperial Academy of Sciences.
 — :—Imperial Botanical Gardens.
 Stockholm :—Royal Academy of Sciences.
 Trieste :—Adriatic Society of Natural Science.
 Turin :—Academy.
 U. S., America. :—Geological Survey of the Territories.
 Vienna :—Imperial Geological Institute.
 — :—Anthropological Society.
 — :—Imperial Academy of Sciences.
 — :—Zoological Society.
 Washington :—Smithsonian Institution.
 — :—Commissioners of the Department of Agriculture.
 Yokohama :—German Oriental Society.
 — :—Asiatic Society of Japan.
 Zagreb :—Archæological Society.

ABSTRACT OF PROCEEDINGS OF COUNCIL DURING 1880.

January 29th, Ordinary Meeting.

Letters were read from Dr. S. B. Partridge tendering his resignation as Member of the Council, and from Dr. T. R. Lewis and Mr. L. Schwend-

ler expressing their willingness to allow themselves to be nominated Members of the Council for 1880.

The Council sanctioned the recommendation of the Secretary that Islám Khán's pension should be continued for life, and ordered that all such pensions should be paid from the Piddington Pension Fund.

The recommendation of the Finance Committee that one of the collecting Sircars should be discharged, and that the other should be retained on a commission of 5 per cent., was agreed to.

The programme for the Annual Meeting and the Annual Report were read and approved.

February 26th, Ordinary Meeting.

The Members of the Finance and other Committees were elected.

Mr. C. H. Dreyer's offer to complete the Library Catalogue for Rs. 600 was accepted.

Dr. A. F. R. Hoernle's proposals with regard to the rates paid for printing and editing the Bibliotheca Indica were agreed to, with an amendment proposed by Dr. Mitra, that the rate at which editing work is to be paid for be fixed simply as it is difficult or easy. It was also directed that Dr. Hoernle's memorandum on the subject should be printed for the use of the Council and of the Finance Committee.

The recommendation of the Finance Committee that 2 pairs of book-cases should be purchased for Rs. 1,000 was ordered to be referred back to the Committee for reconsideration with the annual accounts.

April 1st, Ordinary Meeting.

A letter was read from the Superintendent, Baptist Mission Press, asking if the printing of the Isabah is to be continued; also a minute by Dr. Hoernle recommending that the work should be continued, and stating that Mr. O'Kinealy had kindly offered to superintend its printing. The minutes of the Council on a memorandum by the Philological Secretary on the affairs of the O. P. Fund were also read. After a prolonged discussion on the advisability of adopting the proposals made by the Philological Committee for regulating the selection of works for publication in the Bibliotheca Indica, it was resolved that formal sanction should be given to the publication of nine works (the names of which have been given in the Proceedings for May 1880), and that it should be left to the Philological Secretary to determine the rate at which each should be published.

An exchange of publications with the Stockholm Academy of History and Antiquities was sanctioned.

April 29th, Ordinary Meeting.

On the resignation of Mr. J. Crawford, Mr. A. Pedler was elected Member of Council, General Secretary and Trustee of the Indian Museum.

A memorandum by the President on the advisability of increasing the number of the Council was read, and the proposed alteration was agreed to. The necessary modifications in the rules were ordered to be proposed at the next meeting of the Society.

An exchange of Part I of the Journal for the Zagreb Archæological Society's publications was agreed to.

The Philological Secretary submitted a statement of rules and rates connected with the publication of the Bibliotheca Indica, Journal and Proceedings, which he had prepared for the press in accordance with the order of Council. Fifty copies were ordered to be printed.

The rates of remuneration at which the newly appointed editors of the Bibliotheca Indica are to be paid were agreed upon. As Mr. C. H. Tawney refused to accept any remuneration, it was ordered that he should be presented with 30 copies of his work.

The Philological Secretary reported that he had made over the printing of Mr. Dames's Baloochi Grammar to the Baptist Mission Press, and that he had written to the Bombay and Punjab Governments asking for aid in printing the work.

The Philological Secretary was asked to institute an enquiry as to whether it was necessary to have a person in charge of the vernacular portion of the Library and to report at a future meeting.

On the resignation of Mr. Beverley as Treasurer and Mr. H. F. Blanford as Member of Council, Mr. J. C. Douglas was elected Member of Council and Honorary Treasurer.

May 29th, Ordinary Meeting.

An exchange of publications with the Linnean Society of Bordeaux and with the United Service Institution of India was sanctioned.

Letters were read from the Secretaries to the Governments of Bombay and of the Panjab subscribing for 5 and 50 copies respectively of Mr. Dames's Baloochi Grammar. A letter was directed to be written to the Secretary to the Foreign Department, Government of India, asking Government to subscribe for copies of the same work.

An order was passed that books from the Library should be issued on the requisition of the officer in charge of the Surveyor General's Office, Calcutta, on the same terms as to Members.

A recommendation of the Finance Committee that in future their Meetings should be held on the 4th of each month, except when that date falls

on a Saturday, Sunday or Monday, when the meeting should be held on the following Tuesday, was agreed to.

It was ordered that the Society's accounts should be kept according to the plan suggested by Mr. Douglas, and a temporary clerk was appointed on Rs. 15 a month to help in preparing the accounts.

July 1st, Ordinary Meeting.

The Minutes of the Council were read on a memorandum by Dr. R. Mitra on the state of the Oriental Library. A Committee was appointed (1) to enquire whether MSS. and books to the extent indicated in Dr. Mitra's Memo. have disappeared and to ascertain, if possible, in what way this loss has occurred, (2) to report how far the MSS. have been catalogued, and (3) to suggest suitable arrangements for the safe custody of the MSS. in the future.

July 29th, Ordinary Meeting.

A letter was read from the Secretary to the Government of India, Foreign Department, subscribing for 40 copies of Mr. Dames's Baloochi Grammar.

A letter was read from Dr. T. R. Lewis tendering his resignation as Member of the Council, and it was resolved that Mr. H. F. Blanford should be re-appointed Member of Council in his place.

A letter was read from the Private Secretary to the Viceroy, stating that Lord Ripon accepts the post of Patron of the Society.

An exchange of the Proceedings for the publications of the Cassel Society of Natural History was sanctioned, and an application from the Editor of the Zeitschrift für Wissenschaftliche Geographie, for an exchange, was declined.

The recommendation of the Oriental Library Committee to appoint temporarily a Munshi and Pandit each on Rs. 35 per mensem, was agreed to.

August 26th, Ordinary Meeting.

Mr. R. W. Nicholson, Lt.-Col. M. G. Clerk, Babus Benod Behary Mullick and Sib Chunder Nag and Khalif M. Hassan were elected ordinary members of the Society.

The Minutes of the Council were read on a letter from Dr. R. Mitra forwarding 2 bills for the editing and printing of his Catalogue of the MSS. in the Library of H. H. the Maharaja of Bikaner. It was ordered that Dr. Mitra's letter with the 2 bills should be forwarded to Government; and that, with reference to the paragraph in the preface of the Catalogue in which Dr. Mitra states that he has worked with imperfect materials, Gov-

ernment should be reminded that the correspondence on this subject has already been before them.

September 30th, Ordinary Meeting.

Messrs. E. M. Sage, and R. O. Lees were elected Ordinary Members of the Society.

A letter was read from Dr. R. Mitra forwarding 10 copies of his report on the Conservation of Sanskrit MSS. for the past year.

A request from the Proprietor of the "Asian" that the Society should subscribe for his paper was declined.

Dr. Garbe's edition of the text of the Apastamba Śrauta Sūtra was ordered to be substituted, in the list of publications undertaken by the Society, for Dr. Schroeder's Maitrāyaṇī Saṃhitā.

October 28th, Ordinary Meeting.

A letter from Dr. T. E. Charles, offering translations of the Nidāna and Suśruta which he has had prepared at his own expense, to the Society if they will undertake to publish them, was ordered to be referred to the Philological Committee.

An application from the Natural History Society of Brunswick, for an exchange of publications, was declined.

The Secretary submitted the report of the Sub-Committee appointed to investigate the condition of the Oriental Library. It was ordered to be circulated to the Members of the Council.

November 25th, Ordinary Meeting.

An exchange of publications with the Royal Dublin Society was sanctioned.

On the recommendation of Mr. H. Rivett-Carnac it was ordered that abstracts of the proceedings at the meetings of the Society should be published in the daily papers.

Babu Thakur Dass Banerji was appointed on trial, on Rs. 30 per mensem, to do the work of indexing the old records of the Society.

It was agreed that all the Journals and Proceedings previously distributed though Messrs. Trübner & Co. should be sent direct by post for the future.

A pension of Rs. 15 per mensem was allowed to Babu Buddhinath Bysack, the Society's old Cashier.

December 20th, Ordinary Meeting.

A letter was read from Mr. H. G. Keene announcing the near completion of Beal's Oriental Biographical Dictionary.

A memorandum by Dr. Mitra was read stating that, in their present condition, the translations of the *Suṣruta* and *Nidāna* offered by Dr. Charles are unfit for publication, and suggesting that they should be made over to Dr. Uday Chand Dutt for the purpose of editing and revision. It was ordered that the result of Dr. Mitra's investigations should be communicated to Drs. Harvey and Smith, who have been requested by Dr. Charles to act for him in this matter.

The thanks of the Society were ordered to be conveyed to the Oriental Library Committee and to its Secretary for the valuable report submitted by them.

It was ordered that Babu Thakur Dass Banerji should continue indexing the Society's old records.

The Catalogue of the books in the Library, as completed by Mr. Dreyer, was submitted.

The PRESIDENT then delivered the following address:

"I hope the meeting will agree with me in thinking the report a satisfactory one, showing that the affairs of the Society have made good progress during the past year. There has been a large addition to the list of members; the catalogue of the Library is ready to go to press; and the reorganisation of our accounts is an accomplished fact. Last year I mentioned the trouble Mr. Westland had taken to re-cast our system of book-keeping. The greater labour of carrying out the reformation devolved upon our present Treasurer, who further modified the proposed system and brought it into successful operation, as may be judged by the financial statement attached to the report. The Society is under much obligation to Mr. Douglas for the time and skill he has devoted to its service. Our Honorary Secretaries have been no less diligent in the performance of their editorial and administrative functions, and I would ask you to convey to those gentlemen the gratitude of the Society, by a vote of thanks."

A vote of thanks to the Officers of the Society was unanimously carried.

At the suggestion of the President—

Mr. J. Westland and Col. Sconce were appointed to audit the annual accounts.

The Meeting was then resolved into the Ordinary Monthly General Meeting.

H. B. MEDLICOTT, Esq.; F. R. S., President, in the Chair.

The minutes of the last Meeting were read and confirmed.

The following presentations were announced—

1. From the Home, Revenue and Agricultural Department,—(1) a Catalogue of Sanskrit MSS. in the Library of H. H. the Maharāja of Bika-

neer, by Dr. R. L. Mitra; (2) Notes on Afghanistan and part of Biluchistan, by Major H. G. Raverty.

2. From M. de Goeje,—(1) *Kitabo 'l Ahdád*, by M. Houtsma, (2) *Al Moschtahih*, by Dr. P. de Jong.

3. From the author,—*Grammar of the Classical Arabic Language*, Parts II and III, by M. S. Howell.

4. From the *Meteorological Reporter to the Government of India*,—Report on the administration of the Meteorological Department of the Government of India, 1879-80, by H. F. Blanford.

5. From the Assistant Secretary, P. W. D., British Burmah,—Report on the Irrawady river, by R. Gordon.

6. From Dr. G. Leitner,—*Proceedings of the Anjuman-i-Punjab* during October, November and December 1880.

The following Gentlemen, duly proposed and seconded at the last meeting, were balloted for and elected Ordinary Members:—

P. I. Carter, Esq.

Captain T. Morris Jenkins.

Major W. F. Prideaux.

R. C. Laughlin, Esq.

Dr. G. Bomford.

The following are candidates for ballot at the next meeting:

1. Sir Ashley Eden, K. C. S. I., Lieutenant-Governor of Bengal (re-election), proposed by the President, seconded by the Secretary.

2. H. J. Reynolds, Esq., C. S., proposed by the President, seconded by the Secretary.

3. L. King, Esq., Assistant Commissioner of Rohtuk, proposed by Col. C. Minchin, seconded by M. Macauliffe, Esq.

4. F. C. Channing, Esq., C. S., Lahore, proposed by D. Ibbetson, Esq., seconded by A. Pedler, Esq.

5. E. R. Shopland, Esq., Post Master, Akyab, proposed by L. Schwendler, Esq., seconded by A. Pedler, Esq.

6. Captain L. A. C. Cook, 5th Bengal Cavalry, Jamrud, proposed by J. G. Delmerick, Esq., seconded by A. Pedler, Esq.

7. Babu Hem Chunder Gossain, Calcutta, proposed by A. Pedler, Esq., seconded by the Hon'ble P. M. Mukerjea.

8. W. C. Benett, Esq., C. S., Rai Bareilly, proposed by H. Rivett-Carnac, Esq., seconded by Dr. G. Thibaut.

9. Babu Troylokyanath Mitra, B. L., 1st Subordinate Judge, Jessore, proposed by Babu Adharlal Sen, seconded by A. Pedler, Esq.

10. Babu Bhyrub Chunder Chatterjea, Special Sub-Registrar, Jessore, proposed by Babu Adharlal Sen, seconded by A. Pedler, Esq.

11. J. Bridges Lee, Esq., M. A., F. G. S., F. O. S., F. Z. S., proposed by A. Pedler, Esq., seconded by C. H. Tawney, Esq.

12. Babu Peary Mohun Guha, B. L., Pleader, Jessore, proposed by Babu Adharlal Sen, seconded by Dr. R. L. Mitra.

13. Babu Sreenath Chunder, proposed by W. Swinhoe, Esq., seconded by Babu P. C. Ghosha.

The SECRETARY reported that Mr. W. Lambe had intimated his desire to withdraw from the Society.

Mr. J. C. DOUGLAS then exhibited the working of the Gower Bell Telephone, and explained the principles on which it is constructed.

Dr. HOERNLE exhibited and described 10 coins, the property of Mr. R. Nicholson of the Opium Department, sent for the inspection of the Society by Mr. H. Rivett-Carnac, B. C. S. These coins consist of (1) three silver Bactrian hemidrachmas, one of Azilises and two of Zoilos; very similar to those described in Prinsep's *Indian Antiquities*, Vol. II, pp. 190, 211. One of the two Zoilos is of the degraded type, noticed in the *Journal A. S. B.*, Vol. XXIII, p. 692 (Plate XXXV, No. 11) and in the *Numismatic Chronicle*, Vol. X, p. 72. (2) One gold Kumāra Gupta; as in Prinsep's *Ind. Ant.*, Vol. I, p. 386 (Class II, a); the legends are: *Obv.*, above the bow *ṣra (ṣrī?) mā*; below the arm *ku*; to the right, along the rim, *ṣrī* (rest illegible). *Rev.*, along right-hand rim, *kumāra guptādhirāja*; the letter *dhi* is doubtful. (3) Three silver Kumāra Gupta coins of the Sāh series and the peacock type; similar to those described by E. Thomas in the *Archæological Survey of Western India*, p. 65 (Plate VII, Nos. 22-25); two, however, show traces of date-figures in front of the profile, doubtfully read as 1...5. (4) A gold coin (unknown to the exhibitor) showing, on the *obverse*, a bull sitting in front of a Mahādeva (as *linga-yoni*), below them the recumbent figure of a man, dressed in short dhoti; legend in Kutila characters *ṣrī dhairyyarāja*. *Reverse*: cow with sucking calf; below, a cluster of seven dots; in front, a water-vessel (*sarāi?*) and a fish; above, a wheel and some other indistinguishable



symbols as shown in the woodcut. (6) A gold mohur of the Jaunpur Sultán Ibrahim Sháh Sharqí; dated 828 A. H., apparently similar to the one, noticed by E. Thomas in *Chronicles of the Pathán Kings of Delhi*, p, 321. Legend:—

Obv. في زمن الامام
نائب امير المؤمنين
ابو الفتح خلعت
خلافة

Margin: ضربت هذا الدينار
في سنة ثلثة عشرين وثمانمائة

Rev. الواثق
بتأييد الرحمان
ابو المظفر ابراهيم
السلطان

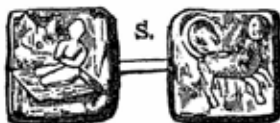
No Margin.



This coin is peculiar on account of the elongated downstrokes of the letters on the reverse, resembling a row of organ pipes. The legend on the obverse is an exact reproduction of that on some of the coins of the Delhi Emperor Feroz Sháh, during whose reign the Jaunpur Sultanat took its rise. (7) A copper coin, the legends of which are too much worn to be distinguished. The head on the obverse has the appearance of being Roman; the figure on the reverse may be Ceres (?), and there appears to be a monogram B.

Dr. Hoernle exhibited and described 12 coins of the later Delhi Emperors. They were selected from a large hoard of 200 coins, found at Nya Doomka in the Santhal Pergunnahs. Among them were four gold mohurs, one of Muhammad Farrukh. Sír, dated 1126 A. H., mint Akbarábád, regnal year 2; one of Muhammad Sháh, date 1148 A. H., mint Jahánábád (?) regnal year 18; one of ditto, date 1161 A. H., regnal year 30 (the last of his reign; the latest of his coins, noticed by Marsden in his *Oriental Coins*, p. 669, is four years earlier, of 1157 A. H.); one of Sháh 'Alam, date 1202 A. H., struck by the English Government in Calcutta. The others are silver Rupees of Sháh 'Alam, of various dates, four struck by the English in Calcutta, four other struck by the Nawáb of Oudh. The latter have the symbol (fish) and name of Benares and are dated 1209, 1226, 1228, 1229 A. H.

Dr. Hoernle also exhibited and described two old Hindu coins, found at Sárnáth, near Benares and presented to the Society by Mr. Holnnette. One is a small round silver piece of a well known type (see Prinsep's *Ind. Ant.* p. 291) with the legend *Śrīmad Gangeya*. The other is a square silver piece, showing on one side, the figure of a Rájá sitting in the well-known kneeling posture, on a square carpet; on the other side is a lion;



both figures are in a diagonal position, as shown in the woodcut. Dr. Mitra, however, thinks that they are more punch marks of some kind or other which have been destroyed by rust.

Dr. Hoernle exhibited 4 silver coins sent by Rájá Udayapratápa Siñha, through Dr. R. Mitra, who communicated the following remarks regarding them:

"Rájá Udayapratápa Siñha, of Bbinga, Oudh, has sent me four silver coins, out of a large number lately found in his táluk. Three of them are of Husain Sháh, and one of Mahmúd Sháh, both of Jaunpur. They are of a type very similar to the copper coin described by Thomas (*Chronicles of Pathán Kings of Delhi*, p. 322) but not exactly alike. They may be thus described:

"Nos. 1 and 2 silver, weight 141-149 grs.

"Obverse— حسین شاه محمود شاه ابرهیم شاه سلطان خلد

"Reverse— الخلیفه امیر المومنین خلدت ۸۶۶

"The inscription is quite clear, but the edges have been filed away, and some of the words have been lost. I guess the remnant of the word *ibn* before Ibráhím in No. 2. The figure 8 in the date is lost in No. 1.

"No. 3 differs from No. 1 in being thinner and smaller; its weight is 56 grains. The inscription is the same, only very much cut off. No date.

"No. 4, silver, weight 53 grains.

"Obverse— محمود شاه ابرهیم شاه سلطان (ني) خلد (ت)

"Reverse. The same as in the first three, but no date.

"As I am not well, and shall not be able to attend the next meeting, will you please exhibit the coins. The typical specimens may be retained for the Society, and the duplicates returned to me."

Dr. Hoernle exhibited some old Hindi inscriptions found in an 'Idgáh, near Monghyr, and sent by Mr. Martin with the following letter :

"I beg to send you a copy of some inscriptions on a stone used as a door-step to an Idgáh at Chewora, Pergunna Amrethu, Zillah Monghyr ; the only thing I can learn about them is that the stone was a part of a house belonging to some Rájá of Behár.

"Inscriptions 1 and 2 are in the positions as they are on the paper, 3 is written in smaller letters under 2, 4 at one side, upside down as marked, 5 also upside down, but rather more to the left of 1, and 6 as on the paper ; the latter is most roughly scratched and is I should say an attempt to cut the word 'Allah' in Urdu. I am sorry I had neither the time or paper for getting a better rubbing."

"If you can kindly inform me to what king &c. the inscriptions refer, I shall be much obliged, also what the words are."

Dr. Mitra, who had read the inscriptions, communicated the following remarks regarding them—

"The inscriptions must have belonged to some Hindu temple whence they have been transferred to the Idgáh. No. 1 I read with absolute certainty.

ॐ देय धर्माय

"This is a formula which occurs repeatedly at the foot of Buddhist statues, and means "this is dedicated to religion." The name of the donor sometimes precedes and sometimes follows the formula, but not unoften omitted.

"No. 2 gives the name of the donor of the above or of some other object. It reads—

जीजवीराकस्य.

"The *shi* must be read *khi* and the name is *Jakkhirāka*.

"No. 3 has been very much spoiled by the attempt to trace the outlines of the letters, and the letters therefore are not reliable. I read it—

सं १२ ८२ ज्यैष्ठ वदि १

"The doubtful letters are 4, 6 and 7. There is no trace of "Allah" in any of the inscriptions."

The following paper was read—

1. *The Phenomenon commonly called the "Cry of Tin."*—By J. C.

DOUGLAS.

If a piece of tin be bent it emits a sound ; this, being regarded as a property peculiar to tin, has been termed "the cry of tin." This phenomenon is explained by the peculiar crystalline structure of the metal. If the

explanation be the true one, then other metals which are obviously crystalline in structure should also exhibit the phenomenon under favourable conditions, but it is exceedingly difficult to place other metals in a crystalline state under proper conditions, *e. g.*, cast iron and cast zinc in thin rods break before they can be bent sufficiently to emit audible sounds, while rolled zinc has had its crystalline structure destroyed by rolling and so is not in a condition to emit sound when bent. Rolled zinc is very tough as compared with cast zinc, and its fracture is not crystalline, but of an even fine-grained bluish tint destitute of the brilliant lustre presented by this metal in a crystalline state. If, however, a piece of rolled zinc be heated for a few minutes to a temperature somewhat below its melting point, the metal becomes much less tough, and its fracture is decidedly crystalline. On bending a piece of zinc so treated it emits a sound weaker than, but of the same nature as, the sound emitted by tin. Cast zinc cannot be bent readily, but if it be pinched between the teeth or with pliers it emits the sound distinctly.

It appears therefore that the cry of tin is due to crystalline structure, that it is not characteristic of tin as generally accepted, but may be emitted by zinc and probably by other metals when crystalline in texture; that rolling in the case of tin and zinc and probably in other cases, destroys the property with the alteration of texture; that in the case of zinc which has been rolled, the crystalline texture may be produced without melting the metal but by merely heating it, and this is so readily done that it affords a ready illustration of the effects of high temperatures on rolled metal. If as supposed this sound is characteristic of the crystalline structure of metals, it may afford a means of great practical use whereby by the sound a metal emits we may draw conclusions as to its texture and hence its fitness for certain purposes, or by the sound emitted by a beam when bent we may draw conclusions as to its safety, the microphone or other appliance being called in to aid us where the sounds are exceedingly weak.

LIBRARY.

The following additions have been made to the Library since the meeting held in January last.

TRANSACTIONS, PROCEEDINGS AND JOURNALS,

presented by the respective Societies and Editors.

Bombay. The Indian Antiquary,—Vol. IX, Part CXIII, December 1880, and Vol. X, Part CXIV, January 1881.

Bordeaux. Société de Géographie Commerciale,—Bulletin, No. 24, 1880, and No. 1, 1881.

Calcutta. Registers of Original Meteorological Observations for November and December, 1879.

———. Geological Survey of India,—Memoirs, Vol. XVI, Part 3.

London. Royal Asiatic Society of Great Britain and Ireland,—Journal Vol. XII, Part 4, October 1880.

———. Royal Geographical Society,—Proceedings, Vol. II, No. 12, December 1880.

———. Geological Society,—Quarterly Journal, Vol. XXXVI, Part 4, 1880.

F. C. J. Spurrell.—On the discovery of the place where Palæolithic Implements were made at Crayford. *P. H. Carpenter.*—On some new Cretaceous *Comatula*.

———. ———. List of Fellows, 1880.

London. Institution of Civil Engineers,—Minutes of Proceedings, Vol. LXII, Part 4, 1879-80.

———. The Academy,—Nos. 450—453.

———. The Athenæum,—Nos. 2773—2776.

———. Nature,—Vol. XXIII, Nos. 581, 583, and 584.

Paris. Société de Géographie,—Bulletin, September and October, 1880.

Washington. United States Geological and Geographical Survey of the Territories,—Bulletin, Vol. V, No. 4.

BOOKS AND PAMPHLETS,

presented by the Authors.

BAIRD, CAPT. A. W. Tide-Tables for the Indian Ports for 1881. 12mo., London.

HOWELL, M. S. Grammar of the Classical Arabic Language. Translated and compiled from the works of the most approved native or naturalized authorities. Parts II—III. Royal 8vo., Allahabad, 1880.

MISCELLANEOUS PRESENTATIONS.

Proceedings of the Anjuman-i-Panjab. October to December 1880. Fcp., Lahore, 1880.

PRESIDENT, ANJUMAN-I-PANJAB.

JONG, DR. P. DE. *Al-Moschtahih*, auctore Schamso'd-din Abu Abdallah Mohammed ibn Ahmed. Svo., Lugduni-Batavorum, 1881.

HOUTSMA, M. TH. *Kitábo-'l-Adhdád sive liber de vocabulis Arabicis quae plures habent significationes inter se oppositas auctore Abu Bekr ibno-'l-Anbári*. Svo., Lugduni-Batavorum, 1881.

M. J. DE GOEJE.

Report on the Cholera Epidemic of 1879 in Northern India, with special reference to the supposed influence of the Hurdwar Fair. Fcp., Calcutta, 1880.

SANITARY COMMISSIONER WITH THE GOVT. OF INDIA.

BLANFORD, H. F. Report on the Administration of the Meteorological Department of the Government of India in 1879-80. Fcp., Calcutta, 1880.

METEOROLOGICAL REPORTER TO THE GOVT. OF INDIA.

GORDON, R. Report on the Irrawaddy River, Parts I, II, III and IV. Fcp., Rangoon, 1879.

PUBLIC WORKS DEPT., B. BURMAH.

Report on the Administration of the Panjab and its Dependencies for 1879-80. Royal Svo., Lahore, 1880.

PUNJAB GOVERNMENT.

Report on Public Instruction in the Madras Presidency for 1877-78 and 1878-79. Royal Svo., Madras, 1879.

MADRAS GOVERNMENT.

Report on the Administration of the Customs Department in the Bengal Presidency for the year 1879-80. Fcp., Calcutta, 1880.

Report on Vaccination in the Province of Bengal for 1879-80. Fcp., Calcutta, 1880.

Report on the Internal Trade of Bengal, for the year 1879-80. Fcp., Calcutta, 1880.

Report on the Administration of Bengal, 1879-80. Royal Svo., Calcutta, 1880.

Records of the Geological Survey of India,—Vol. XIII, Part 4.

BENGAL GOVERNMENT.

The Indian Antiquary, Vol. IX, Part 113, December 1880.

HOME, REVENUE AND AGRICULTURAL DEPARTMENT.

: PERIODICALS PURCHASED.

- Calcutta. Calcutta Review,—No. 143, January 1881.
 ———. Stray Feathers,—Vol. IX, No. 4.
 ———. Indian Medical Gazette,—Vol. XVI, No. 1, January 1881.
 Supplement.
 Geneva. Archives des Sciences Physiques et Naturelles,—Vol. IV, No. 12, December 1880.
 Giessen. Jahresbericht über die Fortschritte der Chemie, Part 2 of 1879.
 Göttingen. Gelehrte Anzeigen,—No. 52, 1880, and Nos. 1-2, 1881.
 Leipzig. Annalen der Physik und Chemie,—Vol. XI, Part 4.
 ———. ———. Beiblätter,—Vol. IV, Part 12.
 London. Philosophical Magazine,—Vol. X, No. 64, December 1880.
 ———. The Entomologist's Monthly Magazine,—Vol. XVII, No. 199, December 1880.
 ———. The Entomologist,—Vol. XIII, No. 211, December 1880.
 ———. The Ibis,—Vol. IV, No. 16, October 1880.
Slater, P. L.—Remarks on the present state of the *Systema Avium*. *Vogt. C.* *Archæopteryx macrura*, an intermediate form between Birds and Reptiles.
Gurney, J. H.—Notes on a 'Catalogue of *Accipitres* in the British Museum', by R. B. Sharpe (1874).
 ———. Messenger of Mathematics,—Vol. X, No. 7, November 1880.
 ———. Journal of Botany,—Vol. IX, No. 216, December 1880.
 ———. Annals and Magazine of Natural History,—Vol. VI, No. 36, December 1880.
Günther, Dr. A.—Description of *Ophites japonicus*, a new Snake from Japan.
 ———. Journal of Science,—Vol. II, No. 84, December 1880.
 London. Numismatic Chronicle,—Vol. XX, Part 3, 1880.
 ———. Society of Arts,—Journal, Vol. XXIX, Nos. 1465—1468.
 ———. The Publishers' Circular,—Vol. XLIII, Nos. 1038—1039.
 ———. Chemical News,—Vol. XLII, Nos. 1099—1101.
 New Haven. American Journal of Science,—Vol. XX, No. 119, November 1880.
 Paris. Comptes Rendus,—Vol. XCI, Nos. 23-26.
 ———. Revue Critique,—Vol. X, Nos. 50-52, Vol. XI, No. 1.
 ———. Revue des deux Mondes,—Vol. XLII, Part 4, and Vol. XLIII, Part. 1.
 ———. Journal des Savants, December 1880.
 ———. Revue Scientifique,—Vol. XIX, Nos. 25-26; and Vol. XX, No. 1.

BOOKS PURCHASED.

GEIKIE, JAS. Prehistoric Europe. Roy. 8vo., London, 1881.

HUME AND MARSHALL. Game Birds of India, Burmah and Ceylon. Vol. III. Roy. 8vo., Calcutta, 1881.

MUELLER, MAX. Sacred Books of the East,—Vol. VI, The Qur'an, Part I, and Vol. IX, The Qur'an, Part II. 8vo., Oxford, 1880.

SCHLIEMANN, DR. H. Ilios; The City and Country of the Trojans. Roy. 8vo., London, 1880.



PROCEEDINGS
OF THE
ASIATIC SOCIETY OF BENGAL.
FOR MARCH, 1881.

The Monthly General Meeting of the Asiatic Society of Bengal was held on Wednesday, the 2nd March, 1881, at 9 P. M.

C. H. TAWNEY, Esq., M. A., Vice-President, in the Chair.

The minutes of the last Meeting were read and confirmed.

The following presentations were announced—

1. From the Marine Survey Department,—A List of Light-Houses and Light-Vessels in British India, by R. C. Carrington.

2. From the K. B. Akademie der Wissenschaften zu München,—(1) Das Haus Wittelsbach und seine Bedeutung in der deutschen Geschichte, by J. v. Döllinger, (2) Ueber den geologischen Bau der libyschen Wüste, by Dr. K. A. Zittel, (3) Die Pflege der Geschichte durch die Wittelsbacher, by Dr. L. Rockinger.

3. From the Palæographical Society,—Facsimiles of Ancient MSS., Oriental Series, Part V, by W. Wright.

4. From the Surveyor General of India,—(1) Account of the Operations of the Great Trigonometrical Survey of India, Vol. VI, (2) Synopsis of the Results of the Operations of the Great Trigonometrical Survey of India, Vol. VII.

5. From the authors,—(1) Report on the Electric Light at the East Indian Railway Company's Station, Howrah (Calcutta), by L. Schwendler, (2) Sketch of the Hindustani Language, by C. J. Lyall.

6. From the Home, Revenue and Agricultural Department,—the Sacred Books of the East, Vols. VI and IX, edited by F. Max Müller.

7. From Mr. Holgnette,—one silver and one copper coin.

8. From Dr. A. F. R. Hoernle,—13 Nos. of the Deutsche Litteratur Zeitung.

The following Gentlemen, duly proposed and seconded at the last meeting, were balloted for and elected Ordinary Members :

Sir Ashley Eden, K. C. S. I. Lieut.-Governor of Bengal (re-election.)

H. J. Reynolds, Esq., C. S.

L. King, Esq.

F. C. Channing, Esq.

E. R. Shopland, Esq.

Captain L. A. C. Cook.

Babu Hem Chunder Gossain.

W. C. Bennett, Esq., C. S.

Babu Troylokyanath Mitra, B. L.

Babu Bhyrub Chunder Chatterji.

J. Bridges Lee, Esq., M. A., F. G. S., F. Z. S., F. C. S.

Babu Peary Mohun Guha, B. L.

Babu Sreenath Chunder.

The COUNCIL reported that Mr. V. Ball had been appointed Member of Council under Rules 4 and 46 (as amended during the past year), and that he would officiate as Natural History Secretary during Mr. Wood-Mason's absence from Calcutta.

The SECRETARY reported that the following coins had been acquired under the Treasure Trove Act.

1. Four gold and eight silver coins found at Nya Doomka, Santhal Pergunnabs.
2. Six silver coins from Basti.

The SECRETARY read a letter from Lieut.-Col. J. W. H. Johnstone, dated, February 15th, 1881, regarding the supposed identity of the Awans resident in the Salt Range with the Jods of Baber.

"General Cunningham in his Archæological Report on the North-West Panjab wishes to identify the Awans resident in the Salt Range as the Jods of Baber. In fact a tribe of Jods is still located in this part of the country where Baber found them. This tribe is known to be a branch of the Janjúás, and there is no difficulty on the subject of the Jods, except that we now find the possessions of the Jods and Janjúás with the Awans. I have known this for some years, and am sorry I did not before communicate it to the Society. The explanation I would give of the Awans' possession of the country is this. They were resident on both the branches of the Indus below the Salt Range. Baber found the present country of the Marwats in the Bannú district occupied by Isákhíl Níázís. Subsequently

a wave of irruption took place from the hills. The Isákhíl Níázís were displaced by the present Marwatis. The former ejected the Awans from Isákhíl and Mianvali and drove them into the hills compelling them in turn to expel the Jods and Janjúás. The head man of Kálábágh is still Mullah Múzaffar Khán, the Chief of the Awans."

The following papers were read—

1. *A short note on the Shrines of Sitákhund in Ohittagong.*—By ADHAR LÁL SEN, Deputy Collector of Jessore, lately of Ohittagong.
(Abstract.)

After describing the geographical situation of Sitá Khund, the author of this paper, explains the derivation of its name "from a hot spring consecrated to Sitá, the deified heroine of the Ramáyana," and relates the various traditions regarding the disappearance of the hot spring which no longer exists in that locality. It is said to have been filled up in consequence of a dispute between the followers of Vishnu and Siva. An attempt was made by the present Mahant of the place to again open up the spring, but without success; and it is supposed that there never really was any hot spring in that locality, on account of its being "devoid of all trace of bitumen, which is invariably discovered in the adjacent hot springs." The author then proceeds to quote large extracts from various Purápas, relating the connection of Ráma and Sitá with the Sitákhund, and shows the untrustworthiness of these Puránic relations by comparing them with the accounts in Valmiki's Ramáyana according to which Ráma and Sitá can never have been in the regions where the Sitákhund is situated. Finally the author traces the pilgrim's journey as he passes from one shrine to another, giving various interesting details of each locality.

Mr. Ball remarked that though it may be true that there never was a hot spring in the locality mentioned, the absence of any trace of bitumen was no proof of its non-existence.

Extracts from this paper will be published in the Journal, Part I.

2. *A list of Earthquakes recorded in Assam during the year 1880.* Communicated by the Meteorological Reporter to the Government of Bengal.

The list will appear in the Journal, Part II.

3. *On the coins of Oharibael, king of the Homerites and Sabæans.*—By MAJOR W. F. PRIDEAUX, F. R. G. S., Bombay Staff Corps.

(Abstract.)

This paper gives a description of two Himyaritic coins, which were received by the author from Aden in 1880, and attributed by him to Chari-

bael, who is mentioned in the twenty-third chapter of the *Periplus of the Erythraean Sea* as the paramount Sovereign of the contiguous tribes of the Homerites and Sabaeans, and as having been on terms of friendly alliance with the Roman Emperors. This monarch was probably identical with the Himyaritic king *Kariba-él Wattár Yehan'am*, whose name appears on three of the inscriptions discovered by M. Arnaud in the neighbourhood of Márib in 1843, as well as on the coins exhibited to the meeting. The paper concludes with a short sketch of the Himyaritic monetary system, which may be classified into three divisions, (1) the thick imitations of the Athenian drachma, (2) the thin imitations of the late Athenian tetradrachma, and (3) the indigenous mintage with two heads, one on the obverse and one on the reverse of the coin (of which, in addition to the coins of Charibael, a few specimens were exhibited to the meeting). This last was probably the precursor of the rare Axumite series in gold, which appears to have remained current until the introduction of Islám into South Arabia.

This paper will be published in the Journal, Part I, with a Plate.

4. *Comparative Table of the conjugations of the verbs substantive in Eastern Hindí.*—By G. A. GRIERSON, C. S.

5. *On a New Find of Early Muhammadan Coins of Bengal.*—By
DR. A. F. R. HOERNLE.

(Abstract.)

This paper describes 14 early Muhammadan Coins of Bengal, found in November 1880 near Gauhati in Assam. They consist of 4 coins of Shams-ud-dín Altamsh, 2 of Jalálat-ud-dín (Rizíyah), 1 of 'Alá-ud-dín Mas'aúd Sháh and 3 of Násir-ud-dín Mahmúd Sháh, all Emperors of Dehli; also 1 coin of Ghiyáz-ud-dín 'Iwaz and 3 of Mughís-ud-dín Yúzbak, both independent Sultáns of Bengal. Among these the coin of 'Alá-ud-dín Mas'aúd Sháh appears to be unique, being an exact counterpart (barring, of course, the ruler's name) of the coin of Násir ud-dín, No. 60, in Thomas' *Chronicles of the Pathán Kings of Dehli*, p. 81. It is further important as showing that the last mentioned coin should be ascribed to the younger Násir-ud-dín rather than the elder. The coins of Mughís-ud-dín appear to be new. They are also important inasmuch as they help to determine the period of that Sultán's independence, which seems to have lasted only about three years from A. H. 652—655.

This paper will be published in the Journal, Part I, with three Plates.

Mr. Gibbs said that the paper a part of which had just been read was an interesting one; he had been for some years engaged in collecting Pathán and Moghul coins, and had procured many curious and rare speci-

mens. He hoped to be able to draw up a paper from the MS. on the new coins of the Pathán kings which had been found since Mr. Thomas' book was published. He might mention two very curious ones: (1) a gold of king No. 9, Násir-ud-dín Mahmúd, and (2) a gold of king No. 17, Násir-ud-dín Khushan. The former shows Thomas' remark on page 134 that Ghíáz-ud-dín Balban was the first king that struck gold coins is incorrect. This gold coin is now in the Imperial Academy at Berlin. Mr. Gibbs having exchanged it for some rare Moghul coins with the late Col. Guthrie some years ago, before he collected the Pathán series. With regard to the latter king only one silver coin is known. It is in this Society's collection, but the gold one which he obtained through a Marwari in Bombay is of much finer execution than the silver coin.

Mr. Gibbs's experience leads him to the opinion that gold and silver coins will be found of all the Pathán kings; it was the custom to coin such for distribution when the monarch was first placed on the throne, and it will be found that even now not more than 12 out of the first 30 Pathán kings are without specimens of either large gold or silver coins, often of both. Mr. Gibbs also further noticed that the series of coins of the smaller Muhammadan kingdoms set up after Muhammad bin Tughlaq were curious and worth collecting. He had had the good fortune during the famine in Bombay to get a good many specimens of the Bahmani, Malwah and Muhammadan coins, and as regard the first he had acquired the only 3 gold coins known. A paper with plates of this series will appear in a future No. of the Numismatic Chronicle for which Mr. Gibbs left instructions before he left England.

Mr. Gibbs stated that he had been engaged with Dr. Hoernle in arranging the Society's collection, and he hoped that before long a complete catalogue might be ready which will be of great service to other Museums and collectors in showing what coins were actually extant.

6. *Some Observations on the Standing of Animals, the Perching of Birds and the Walking Pace of Man.*—By J. C. DOUGLAS.

I.—*The Standing of Mammals and Birds.*

A Bird standing on one leg appears so strikingly unstable an object, that most observant persons feel the want of an explanation of first, why the bird chooses to stand on one leg rather than on both; and second, why this position is assumed as one of rest. It is obvious that the raised leg is rested, but it is equally obvious that the other leg has to do the work of both, and there is a decided reduction in stability, when using only one leg; but, from the bird resting in this position, there must be physiologically some economy, which renders the less stable position also less exhausting. This resting the limbs alternately is particularly frequent in natatorial birds

when standing : their legs apparently being very readily fatigued by bearing the weight of their bodies ; but although most striking in birds, it is also common to mammals. Horses particularly may be observed resting one leg at a time, and man does not as a rule stand equally on both legs, but puts his weight on each leg alternately ; even when sitting on a chair he commonly rests his legs alternately by hanging one across the other. I think this phenomenon is explained as follows :—Every muscle must have intervals of rest, and the muscles, supporting an animal which rests standing, must be rested alternately. To render this possible, the law of muscular exhaustion must in certain cases admit of the *load* on a muscle being increased, without proportionately *hastening* exhaustion. A muscle, removed from the body and stimulated to contract, suffers exhaustive loss of irritability, in direct proportion to the rapidity with which the stimuli follow each other, and exhaustion is most readily produced by stimuli following each other so rapidly, as to induce continued contraction, *i. e.*, tetanus ; but the amount of the load, if not too large, does not apparently affect the course of exhaustion, the exhaustion of two muscles bearing different loads being parallel. This being the case, it may be quite possible for an animal to even double the load on one set of muscles, without hastening their exhaustion. The muscles, bearing the additional load, not necessarily being exhausted proportionately sooner than under their own proper load, it is evident a bird resting on one leg does not exhaust it in time shorter in proportion to the increased load ; hence it is enabled to rest its whole system standing, a part at a time, just as completely as it could rest it all at once by laying down. The case with which a bird stands on one leg is due to the relatively great surface of its base, the length of base, excluding the nails of the toes, reaching in small birds half the bird's height, that is, a man's feet would have to be two and a half to three feet long, to secure a proportional base ; the width of a bird's base in front is also relatively great.

II.—*The Perching of Birds.*

The bird, standing on one leg, is only one instance of a very general case, and it rests itself in that attitude by reason of a physiological law governing muscular exhaustion ; but the case of a bird, sleeping on one leg on a perch, has been considered as differing from the case of a bird sleeping on one leg on the ground, and, while it is obvious the bird on the ground really maintains the upright position by balancing itself, precisely as a man does, this explanation has been considered as insufficient in the case of the perching bird. The explanation commonly accepted appears to have originated with Borelli about two hundred years ago, and is as follows :—

The flexors of the toes pass over the knee and heel in such a manner, that when the leg is bent by the weight of the body, the toes are flexed, the

sleeping bird is thus held securely on his perch by the weight of his own body; and some authors add "without fatigue." I purposely omit other details such as the structure of the joints by which the leg is stiffened laterally and vertically.

In the first instance, if the toes were flexed by the weight of the body putting tension on the muscles, this could not happen without causing fatigue, for the mere tension of a muscle influences its nutrition and waste, hence muscular exhaustion would result. That exhaustion is felt, is proved by the bird using only one leg while resting the other, also by the fact that it changes the leg from time to time, and that on waking, the foot is opened as if cramped. The evidence in favour of Borelli's explanation is anatomical; if the leg of a dead bird be bent under certain circumstances, the toes close together, and the foot may be so made to seize the finger of the experimentalist; if the leg be dissected, the movements of the parts may be clearly seen to bring about the result. But although this takes place in the dead bird, and is therefore possible in the live one, it by no means follows that this is the mechanism of perching. Even this purely anatomical phenomenon, which has been relied on to prove the physiological conditions, is not invariably present, for if a bird die with its leg contracted and its claw extended, the leg may be extended and flexed without closing the toes; in fact, the production of the phenomenon depends on the condition of the muscles after death. If the bird dies with its claws open and leg extended, the flexor muscles of the toes are not opposed by the extensors, they shrink and lose their elasticity when they die, and the phenomenon is produced; if they are opposed by the extensors, and the leg is bent, they lose their elasticity but cannot contract, and are therefore, when dead, elongated, and the phenomenon is not produced. It is very obvious in the live bird these muscles are elastic, and their exact length while living may be anything between the above extremes, but whether they act in the manner stated, depends entirely on their condition in the living bird, which is standing with his legs bent at their normal angle, these muscles being opposed by another set of muscles, and both being under the control of the bird's will. Because bending the leg bends the toes in a dead bird, in which the muscles have lost their elasticity and become shortened, to assume that therefore in the live bird, the mechanism acts precisely in the same manner, is an assumption in my opinion which is contradicted by observation of the living bird, and by the consideration of the general laws of which the perching bird is but a particular instance. Mammals and birds, on plane surfaces, maintain the upright attitude by balancing themselves, and birds standing on two legs on a perch do not, unless the perch be shaken, hold the perch, they simply balance themselves; the birds are prevented from slipping by the soft under-surface of the foot, which gives a foot-hold little liable to slip on the rough bark of a tree, and if the perch

be moved, slipping is still further guarded against, by turning in the nails so that their points touch the perch. If the perch be violently swung, the bird bends his legs, and rests with his breast on the perch, thereby lowering his centre of gravity. If a live bird be perched on the finger, it will be felt that it balances itself and does not grip, but it frequently uses the points of its claws, particularly of the hind ones. If the hand be moved forwards, the bird having a tendency to fall backward, it will be found to actually raise its front toes, and stick in the points of the hind claws; far from gripping tighter, it actually grips less tightly. If a sleeping bird be shaken, it awakes and puts down its second foot. If the perch be swung while the bird is asleep, the bird will be observed to move its body *in advance* of the movements of the perch. Although the sleeping bird usually uses the point of his hind nail, he does not always do so, and sometimes sleeps, obviously *not* holding the perch, but evidently balancing, the perch being stationary, but if the perch be moved slightly, the hind nail is used immediately. I cannot detect any bending of the leg, when the bird goes to sleep, beyond that which exists when it is awake, nor is the flexure of the last joint of the toes accompanied by a bending of the leg under ordinary circumstances. On the other hand there can be no doubt, that, in the live bird, flexure of the toes is independent of bending of the leg; a live bird can open or close its claws, with the leg straightened, or bent close to the body, and if a bird be under the influence of either, the flexure of leg and foot, simultaneously observed in the dead bird, is not observed. Birds commonly rest with the breast on the perch, in these cases, the claws will be found quite open; it is obvious in this case, that flexure of knee and heel does not cause flexure of the toes.

If bending of the leg necessarily caused flexure of the toes, the bird would in some cases evidently be inconvenienced, during incubation for instance. The idea, that the weight of the body tending to bend the leg might so flex the toes as to diminish the fatigue of perching, is obviously erroneous mechanically; for, if the grip of the perch were produced by the contraction of particular muscles, and if the same muscles were employed on the additional labour of preventing flexure of the leg, the two duties would not be so opposed as to make the strain on the muscles less than it would be if they performed but one duty, and the additional duty would increase the load not decrease it. It appears to me, that perching birds really balance themselves, just as mammals and birds on plane surfaces do; that they are enabled to do this just as man is, by means of opposing muscles; that flexure of leg and toes are independently under control of the bird's will as in man; and that the movements found dependent on each other in the dead bird after alteration of the muscles, are independent in the live bird; and that the large surface covered by the toes, the relative lightness

of the body, and the soft under-surface and sharp nails of the toes preventing slipping are sufficient to explain how a bird is enabled to sleep perched, just as a horse or a bird sleeps standing on a plane.

III.—*The Walking Pace in Man.*

Previous observers have assumed that the path traversed by man in walking is a straight one, that each step is alike, and that in natural walking, the complementary motions are evoked regularly and symmetrically. I have made a great number of observations, and have surveyed and plotted out natural paths across an extended plain, and I find the natural path is a wavy line. If the pace be slow, the deviation from the straight line is greater than if the pace be quick, and this deviation is greatest when the walk is very slow. The sinuous walk of a man slightly intoxicated, is an exaggeration of the normal walk; the difficulty of walking slowly beside a second person without occasionally coming against him, unless touch be kept in some way, is a matter of common observation. It appears that the adoption of sinuous paths in laying out gardens, with a view to imitate nature, is an unconscious imitation (often exaggerated) of the foot paths formed naturally, whenever an extended plain has to be crossed by persons on foot, and this sinuosity is a consequence of the natural walk of man being in a sinuous path, probably by reason of the equilibrium being imperfect, and the movements not strictly symmetrical.

7. *List of Diurnal Lepidoptera inhabiting the Nicobar Islands.*—By J. WOOD-MASON, *Deputy Superintendent, Indian Museum, and L. DE NICEVILLE.*

(Abstract.)

In this paper which will appear in the Journal, Part II, the authors state, that in Mr. F. Moore's paper on the Lepidopterous Fauna of the Andaman and Nicobar Islands, only 23 species of rhopalocerous Lepidoptera are recorded from the Nicobar group.

The Museum has recently received from Mr. F. A. De Røpstorff a collection of Nicobar butterflies consisting of thirty-four species, twenty-five of which are recorded, in the present paper, for the first time, and two are described as varieties of known forms.

This paper will appear in the Journal, Part II.

LIBRARY.

The following additions have been made to the Library since the meeting held in February last.

TRANSACTIONS, PROCEEDINGS AND JOURNALS,

presented by the respective Societies and Editors.

- Berlin. K. preussische Akademie der Wissenschaften,—Monatsbericht, September and October 1880.
- Bordeaux. Société de Géographie Commerciale,—Bulletin, No. 2.
- Calcutta. Geological Survey of India,—Memoirs, Palæontologia Indica, Series XII, Vol. III, Part 1.
- Feistmantel, Dr. O.*—The Flora of the Talchir Karharhari Beds.
- Lisbon. Sociedad de Geographia,—Boletín, Second Series, No. 2.
- London. Royal Microscopical Society,—Journal, Vol. III, Nos. 6 and 6a, December 1880.
- . Royal Astronomical Society, Monthly Notices, Vol. XLI, No. 1.
- . Institution of Mechanical Engineers,—Proceedings, No. 3, 1880.
- . The Academy,—Nos. 443, 451 to 456.
- . The Athenæum,—Nos. 2777 to 2780.
- . Nature,—Vol. XXII, No. 574, and Vol. XXIII, Nos. 585—588.
- München. K. b. Akademie der Wissenschaften,—Sitzungsberichte der mathematisch-physikalischen Classe, Parts 2—4, 1880.
- . ———. philosophisch-philologischen und historischen Classe,—Vol. II, Part 3, 1879; and Parts 1—3, 1880.
- . ———. Abhandlungen,—historische Classe, Vol. XV, Part 2.
- . ———. philosophisch-philologischen Classe,—Vol. XV, Part 2.
- . ———. mathematisch-physikalischen Classe,—Vol. XIII, Part 3.
- New York. American Oriental Society,—Proceedings, October 1880.
- Paris. La Société d'Anthropologie,—Bulletin, Vol. III, Part 3, April to July 1880.
- . La Société de Géographie,—Bulletin, Vol. XX, November 1880.
- Pisa. Società Toscana di Scienze Naturali,—Atti, Processi Verbalì, 14th November 1880.
- Rome. Società degli Spettroscopisti Italiani,—Memorie, Dispensa 9, September 1880.
- Roorkee. Professional Papers on Indian Engineering,—Vol. X, No. 39, February 1881.

Vienna. Kaiserliche Akademie der Wissenschaften,—*Fontes Rerum Austriacarum*, Vol. XLII, Part 2.

———. Archiv für Österreichische Geschichte,—Vol. LIX, Parts 1—2, and Vol. LX, Part 1.

———. Sitzungsberichte,—mathematisch-naturwissenschaftliche Classe, Part I, Vol. LXXIX, Nos. 1—5; Vol. LXXX, Nos. 1—5; Part II, Vol. LXXIX, Nos. 4—5; Vol. LXXX, Nos. 1—5; Vol. LXXXI, Nos. 1—3; Part III, Vol. LXXX, Nos. 1—5; Vol. LXXXI, Nos. 1—3.

———. philosophisch-historische Classe,—Vol. XCIV, Nos. 1—2; Vol. XCV, Nos. 1—4, and Vol. XCVI, No. 1.

———. philosophisch-historische Classe, Denkschriften, Vol. XXX.

———. mathematisch-naturwissenschaftliche Classe,—Denkschriften, Vol. XLI.

Yokohama. Deutsche Gesellschaft für Natur-und Völkerkunde Ostasiens,—*Mittheilungen*, December 1880.

———. Asiatic Society of Japan,—*Transactions*, Vol. VIII, Part 4.

Zagreb. Arkeologickoga Druzva,—*Viestnik*, Vol. III, No. 1.

PAMPHLETS,

presented by the Authors.

LYALL, C. J. Sketch of the Hindustani Language. Sm. 8vo., Edinburgh, 1880.

SCHWENDLER, L. Report on the Electric Light at the East Indian Railway Company's Station, Howrah (Calcutta). Fep., Calcutta, 1881.

MISCELLANEOUS PRESENTATIONS.

CARRINGTON, R. C. List of Light-Houses and Light-Vessels in British India, including the Red Sea and Coast of Arabia (Suez to Singapore). Obl. 4to., Calcutta, 1881.

MARINE SURVEY DEPARTMENT.

DÖLLINGER, J. v. Das Haus Wittelsbach und seine Bedeutung in der deutschen Geschichte. 4to., Munich, 1880.

ROCKINGER, DR. L. Die Pflege der Geschichte durch die Wittelsbacher. 4to., Munich.

ZITTEL, DR. K. A. Ueber den geologischen Bau der libyschen Wüste. 4to., Munich.

K. b. AKAD. DER WISSENS., MÜNCHEN.

WRIGHT, W. The Palæographical Society. Facsimiles of Ancient MSS. Oriental Series. Part V. Fol., London, 1880.

PALEOGRAPHICAL SOCIETY.

Report on the Administration of the Land Revenue Department of the Central Provinces for the Revenue year 1879-80. Fcp., Nagpur, 1881.

CH. COM., CENTRAL PROVINCES.

Account of the Operations of the Great Trigonometrical Survey of India, Vol. VI. 4to., Dehra Dun, 1880.

Synopsis of the Results of the Operations of the Great Trigonometrical Survey of India. Vol. VII. 4to., Dehra Dun, 1879.

SURVEYOR GENERAL OF INDIA.

Sixteenth Annual Report of the Sanitary Commissioner with the Government of India, 1879. Fcp., Calcutta, 1881.

SANITARY COMMISSIONER WITH THE GOVERNMENT OF INDIA.

Indian Forester, Vol. VI, No. 3, January 1881.

BENGAL GOVERNMENT.

PALMER, E. H. (Sacred Books of the East, Vols. VI and IX). The Qurân, 2 Vols. 8vo., Oxford, 1880.

FALLON, DR. S. W. New English-Hindustani Dictionary, Part I.

HOME, REVENUE AND AGRICULTURAL DEPARTMENT.

PERIODICALS PURCHASED.

Göttingen. Gelehrte Anzeigen,—Nos. 3—4, and Index for 1880.

———. Nachrichten,—Nos. 20—21, and Index 1880; No. 1, 1881.

Leipzig. Annalen der Physik und Chemie,—Vol. XII, Part 1.

———. Beiblätter,—Vol. V, No. 1.

London. Society of Arts,—Journal, Vol. XXIX, Nos. 1469—1471.

———. Chemical News,—Vol. XLIII, Nos. 1103—6, and Index to Vol. XLII.

———. Publishers' Circular,—Vol. XLIV, Nos. 1040—1.

Paris. Comptes Rendus,—Vol. XCII, Nos. 1—4.

———. Revue Scientifique,—Vol. XXVII, Nos. 2—5.

———. Revue Critique,—Vol. XI, Nos. 2, 4—5.

———. Revue des deux Mondes,—Vol. XLIII, Nos. 2 and 3.

———. Journal des Savants,—January 1881.

———. Annales de Chimie et de Physique,—Vol. XXI, December 1880.

Philadelphia. Manual of Conchology, Part 8.

BOOKS PURCHASED.

GOULD, J. The Birds of Asia. Part XXXII. Fol., London, 1880.

GOULD, J. The Birds of New Guinea and the Adjacent Papuan Islands. Part XI. Fol., London, 1880.

SALLEY, A. VON. Die Nachfolger Alexanders des Grossen in Baktrien und Indien. 8vo., Berlin, 1879.

PROCEEDINGS
OF THE
ASIATIC SOCIETY OF BENGAL.
FOR APRIL, 1881.

The Monthly General Meeting of the Asiatic Society of Bengal was held on Wednesday, the 6th April, 1881, at 9.15 P. M.

H. B. MEDLICOTT, Esq., F. R. S., President, in the Chair.

In accordance with the announcement made at the Annual Meeting held in February last, the President ordered the balloting lists for the Election of the Council and Officers for 1881 to be distributed, and appointed Col. J. Sconce and Major H. S. Jarrett Scrutineers.

The PRESIDENT announced that the Scrutineers declared the result of the ballot to be as follows :

President.

The Hon'ble Sir Ashley Eden, K. C. S. I., C. I. E.

Vice-Presidents.

Dr. Rájendralála Mitra, C. I. E.

C. H. Tawney, Esq., M. A.

The Hon'ble H. J. Reynolds, B. A., C. S.

Secretaries and Treasurer.

J. Wood-Mason, Esq.

Dr. A. F. R. Hoernle.

A. Pedler, Esq., F. C. S.

V. Ball, Esq., M. A., F. G. S.

Other Members of Council.

H. B. Medlicott, Esq., F. R. S.

J. Westland, Esq., C. S.

J. Eliot, Esq., M. A.

D. Waldie, Esq., F. C. S.

H. Beverley, Esq., C. S.

Babu P. C. Ghosha.

L. Schwendler, Esq.

Mr. Westland said that he trusted he would be allowed as one of the retiring Vice-Presidents of the Society to propose a vote of thanks to Mr. Medlicott, the out-going President. Mr. Medlicott had unusual qualifications for the post both as a man of science, and as a man of business; other gentlemen could testify to Mr. Medlicott's services rendered to the Society in the former capacity, he himself could say from his own experience, how completely and efficiently Mr. Medlicott managed the business of the Society: The Society was under great obligations to Mr. Medlicott, for the labour he had so successfully and so willingly bestowed on the management of its affairs.

In resigning the President's chair, Mr. Medlicott spoke as follows:

It is very gratifying to me to return thanks for the response this meeting has accorded to the kindly words spoken by Mr. Westland. I shall not cease to endeavour to be of service to the Society.

The brief remarks I wish to make on retiring from the office of President would have been more appropriate had this event taken place at the annual meeting, as is customary. As to the few observations I did make on that occasion, in referring to the report for the preceding year, I was surprised to find that they have been printed in our Proceedings for February as "the President's address." It looks like a stroke of irony on the part of our Secretary; but I acquit him of the charge. I by no means meant to make a mockery of the imposing undertaking known as a Presidential Address. On the contrary, I had come prepared to take my leave of office with a humble apology for what many may look upon as my spontaneous collapse. At the same time I wished to justify the step I had taken in resisting what is an innovation, and as I believe a mistaken one, in the practice of our Society. At the previous annual meeting I gave a notice of motion to that effect; and I think the matter of sufficient importance to recur to it now.

The tendency I would deprecate—that of following the practice of learned bodies elsewhere—is superficially laudable; but I may designate it as unpractical and therefore unscientific. The essence of practical reason is, the intelligent apprehension of conditions, and adaptation thereto; in view, no doubt, of a best conceivable standard, but the premature adoption of that standard may be a fatal form of blunder. I do not allow that my action arises from a defective estimate of what a scientific Society should be: it is rather that the standard I look to is incompatible with ourselves and our circumstances. Let us at all events avoid shams and false pretension. We are by profession a scientific body; but our body has been and is to a large extent non-scientific, or even anti-scientific; and symptoms were not wanting that a marked prominence of the scientific element in the administration would lead to atrophy of the body. Few

will deny that, constituted as we are, our President should often be a man known to the general public. A complete obstacle to this would be, and has been, the innovation of an annual presidential discourse upon science in some form, which performance is by no means worth the sacrifice. The real credit of the Society and of its working members depends on the amount of information to be found in its publications. I would, therefore, ask those members to be content with this solid advantage afforded by the Society, and to forego an ambition of flags and fireworks.

I must not, however, allow it to be said, that I am making a virtue of necessity—shielding my incapacity under the guise of renunciation. Of actual incapacity I cannot speak: but I do confess myself unable, without a great deal more leisure than I can command, to prepare what I should care to offer as an address to a learned Society. This touches, perhaps, the most vital objection to the practice I wish to see held in abeyance for special occasions. You can seldom find a suitable president of any denomination who is not already an overworked official; and very few men thus placed so overflow with knowledge as to undertake so serious a task without inadmissible interference with regular duties. Some of you are aware how difficult it has been of late to find a president. More than one member thoroughly competent to lead and to address the Society have declined the post; and though I cannot speak with certainty, I strongly suspect that the obnoxious innovation had much to say to our disappointment. They have escaped by passive resistance; it has fallen upon me to incur the obloquy of overt rebellion, for which I must crave your indulgence.

I have now the satisfaction of handing over office to a President under whom the Society should flourish in all its branches.

Mr. C. H. TAWNEY, M. A., Vice-President, then took the Chair.

The minutes of the last general Meeting were read and confirmed.

The following presentations were laid upon the table—

1. From the Californian Academy,—Early Discoveries of the Hawaiian Islands in the North Pacific Ocean, by H. A. Peirce.
2. From the Registrar, Calcutta University,—Tagore Law Lectures, 1879,—The Law relating to the Hindu Widow, by Troilokyanath Mitra.
3. From the Bengal Government,—The Wild Silks of India, principally *Tussar*, by T. Wardle.
4. From the Madras Government,—(1) A Classified Index to the Sanskrit MSS. in the Palace at Tanjore, by A. C. Burnell, (2) Photographs of Humpi in the Bellary District, of Amravati, of Undapalli and of Kondapalli in the Kistna District.
5. From the Geographical Society of Lyons,—Rapport Annuel, Séance Solennelle, 23rd December 1880.

6. From the authors,—Table showing the conjugation of the Verb substantive in Eastern Hindi, by G. A. Grierson. A Detailed Analysis of Abdul Ghafur's Dictionary of the Terms used by Criminal Tribes in the Panjáb, and a sketch of the Changars and of their Dialect, by Dr. G. W. Leitner. Bi-Metallism at 15½ a necessity for the Continent, for the United States, for England, by H. Cernuschi.

7. From the Home, Revenue and Agricultural Department,—A Comparative Grammar of the Gaudian Languages with special reference to Eastern Hindi, by Dr. A. F. R. Hoernle.

8. From Dr. A. F. R. Hoernle,—Nos. 5 and 6 of 1880 of the Deutsche Litteratur Zeitung, and On the Khorsabad Inscriptions, by Edward Hincks.

9. From the St. Xavier's College Observatory,—Observations taken from July to December 1880.

10. From the Political Agent, Bundelkhand,—14 Copper Coins.

The following Gentlemen are candidates for ballot at the next meeting.—

1. J. Cockburn, Esq., proposed by H. Rivett-Carnac, Esq., seconded by Dr. J. Anderson.

2. Capt. E. Molloy, 5th Ghurkas, Abbotabad, proposed by G. Hughes, Esq., C. S., seconded by H. W. McCann, Esq., M. A., D. Sc.

The SECRETARY reported that the Hon'ble B. W. Colvin and the Bishop of Rangoon had intimated their desire to withdraw from the Society; and that the elections of Mr. J. A. Brown and the Rev. J. S. Doxey had been cancelled under Rule 9.

The COUNCIL reported that Mr. J. C. Douglas had left India, and that Mr. V. Ball had been asked to officiate as Treasurer in his place.

The SECRETARY reported that the following coins had been acquired under the Treasure Trove Act:—

From Deputy Commissioner of Kheri, 4 silver and 4 copper coins.

From Deputy Commissioner of Chhindwara, 6 copper coins.

The SECRETARY announced that the following works had been sanctioned for publication in the Bibliotheca Indica Series, on the recommendation of the Philological Committee:

1. The *Parásara Mádhyava Smṛiti*, to be edited by Paṇḍit Chandra Kánta Tarkálankára, who has just completed an able edition of another law book, the *Gobhiliya Sūtra*. Several MSS. are available and the work will be edited with Mádhyava's commentary.

2. An English Translation of the *Suṣruta*, to be prepared by Dr. U. C. Datta. This is an ancient Hindu medical work, hardly less important than the Charaka. A portion of it has been already translated by another Babu, under the supervision of Dr. Charles, who has placed his MS. at the service of the Society.

3. The *Naqaid el Fezazdaq and Jerir*, to be edited by Mr. C. J. Lyall in conjunction with Dr. Wright of Cambridge. This work is extremely interesting both from the philological and historical point of view, as it abounds in references to the old pagan history of the Arabs, and the commentary with which the text is provided elucidates many obscure points of that subject.

Mr. H. F. BLANFORD, F. R. S. exhibited photographs of the Van Rysselberghe Meteorograph, and specimens of the engraved plates produced by it, with proof impressions from them; and gave a general description of the instrument and its working. A specimen of the record obtained will be found in plate I.

After referring to the fact that eye readings of instruments, if taken only 3 or 4 times in the day were insufficient to meet the demands of modern Meteorological enquiry, and if taken hourly and carried on night and day, demanded such an establishment of observers as to practically restrict detailed observation to a few costly observatories, he observed that, for nearly half a century, inventive ingenuity had been directed to the construction of self-registering or autographic instruments. Among the earlier inventions of the kind were Whewell's and Osler's anemographs, King's barograph, &c., and among the more elaborate of later inventions, the Kew thermographs and barographs which register by photography, Theorell's barograph which prints in figures the value of the barometer reading at short intervals, and Beckley's anemograph.

These instruments were designed to register either one element of observation only, or at the utmost two, as in the case of the thermograph and the anemograph. But some inventors had gone beyond this, and had aimed at registering all the more important elements of meteorological observation by means of one and the same recording apparatus. Such instruments are termed meteorographs, and in order to establish communication between the several instruments and the recording apparatus, the former fixed in various parts of the building according to the character of the required exposure, the latter in a secure place in the interior of the building, the aid of electricity had to be called in. A very elaborate instrument of this kind had been in operation for many years at Berne; another, less elaborate, invented by the late Father Secchi, at Rome; and also at Zi-ka-wei near Shanghai and at St. Xavier's College at Calcutta. But the latest and most compact, and at the same time the least costly and

most effective of all, is the very beautiful instrument, originally designed by M. Van Rysselberghe and constructed with many original improvements by the very ingenious mechanic M. Schubert of Ghent.

Two of these instruments have lately been received for use at Allaha-bad and Lahore; and while awaiting the provision of the requisite accommodation, at the places of their destination, one of them has been set up and is now in operation at the Meteorological office, No. 4 Middleton Row, Calcutta, and is open to the inspection of such members of the Society as may desire to examine it.

The details of the mechanism could hardly be understood without watching the instrument at work, and even then not without some careful study and examination. All that could be attempted would be to give some general idea of its principles.

The instrument registers, at successive intervals of ten minutes, the readings of (1), the dry and wet bulb thermometers; (2), the rain gauge; (3), the direction of the wind; (4), the height of the barometer and (5), the rate of the wind movement in the previous interval. All these are engraved in succession on a thin metallic plate fixed on a revolving cylinder, and, at the same time, the scale of all the instruments is engraved, so that the values may be at once read off; and when the plate is removed from the cylinder and the trace bitten in with etching liquor, it may be printed from in an ordinary copper-plate press, and any required number of copies obtained for distribution.

The principal motive power by which the recording cylinder is made to revolve, and the electric connections with the several instruments made and interrupted in succession, is given by clockwork.

This is set in action, on the completion of each ten minutes interval, by an ordinary clock, the minute-hand of which makes contact with a spring projecting from the brass rim which surrounds the clock face, and completes an electric circuit; the current of which, acting on an electro-magnet releases a detent, allowing the cylinder to revolve, and at the same time causing a shaft to set in action a somewhat complex system of commutators.

Two batteries are employed, each consisting of eight Daniell's elements. One of these serves to work the burin which engraves the trace, by acting on an electro-magnet which pulls back the burin from the cylinder, against which it otherwise presses by means of a spring; the other, the regulating current, is directed through the several instruments in succession by means of the commutators, and then, acting on a series of electro-magnets makes and breaks the engraving current at the proper intervals according to the values indicated by the several instruments. The graduation is effected by passing one or the other current through a brass ring which revolves with the

cylinder and bears a number of deep grooves on its surface corresponding to the graduation of the instruments. A spring which presses on the grooved surface and conveys the current, suffers an interruption of contact when passing over the grooves, and thus produces a minute break in the engraved line, and, when the burin is not engraving, allows it to mark a series of dots corresponding to the graduation.

At the commencement of each revolution and before the registration begins, an endless screw which carries the burin is made to revolve through a sufficient distance to bring the burin about $\frac{1}{10}$ of an inch lower on the plate; and at the end of every two hours through a somewhat greater distance, leaving a broader interval between the engraved lines and furnishing a time-scale.

The first instrument which gives its trace is the dry bulb thermometer. The thermometers are open at top, and the tubes give admission to two probes of platinum wire, which, by means of the mechanism before noticed are made to descend slowly until they form contact with the mercurial columns. As the dry bulb thermometer always (except in an absolutely saturated atmosphere) stands at a higher temperature than the wet bulb, its contact is first made, completing the regulating circuit. This acts on an electro-magnet, which, by attracting an armature, completes the burin current and draws the burin back from the cylinder; and, at the same time, causes a catch to start forward and arrest the further descent of the platinum probe. That of the wet bulb continues to descend, until, on making contact with the mercury, the regulating current acts on another electro-magnet, which interrupts the burin current, releasing the burin, which again presses on and engraves the plate till the regulating current is cut off by the action of the commutator.

Next comes the trace of the rain gauge. The rain gauge is now situated on the roof of the office and communicates with the registering apparatus by two wires, which form a part of the circuit of the regulating current. The regulating current (or a branch of it) can always pass through this circuit, when contact is made in the rain gauge. When rain is falling it passes from the collecting funnel into a tip bucket, and this when full tips and empties itself, at the same time making a metallic contact which allows a momentary current to pass. This current acts on an electro-magnet in the registering apparatus below, the armature of which acting on a ratchet wheel makes a small brass cylinder revolve through a single tooth. One half of this cylinder is of greater diameter than the other, the two surfaces being separated by a helical margin, such as might be produced by applying a wedge-shaped strip of brass plate to the surface of a cylinder, with the two rectangular edges of the wedge respectively parallel to the axis and base of the cylinder, while the hypotenuse forms the helical margin.

A spring, which the mechanism, set in motion by the clockwork, causes to ascend and descend in a direction parallel with the axis of the cylinder, comes in contact with the projecting portion, the breadth of which is the greater the more rain has entered the gauge. During this contact, the regulating current passes, cutting off the circuit of the engraving current, and setting free the graver, which records a line on the plate corresponding to the length of the cylindrical surface in contact with the spring.

Next come the wind directions given by the anemometer. In general construction, the anemometer resembles that of Beckley. The direction of the wind is given by two windmill regulators, which cause to revolve a plate forming the cover of a flat cylindrical box. The plate is metallic and presses on eight insulated springs, set at the eight principal divisions of the compass, and connected with eight wires which lead to the recording apparatus below. There is also a ninth wire always in metallic connection with the revolving plate, and the regulating current passes into the upper plate and down by 6 or 7 of the direction springs and their wires whenever the anemometer wires are brought into circuit by the action of the clockwork. It is never completed through the whole 8 springs. In the upper plate, opposite to the pointer which indicates the wind direction, is let in an insulating piece of glass, and this is always in contact with one and sometimes with two adjacent springs, through which therefore, the communication is cut off.

The eight direction wires communicate with eight small studs; over which the clockwork mechanism causes a small spring to pass, making contact successively. The regulating current, passing through these and acting in the manner already described, allows the graver to make a short mark corresponding to each of them, with the exception of that one (or two) thrown out of circuit by the plate of the anemometer.

Next comes the barometer, and in the case of this instrument, M. Von Rysselberghe has adopted a very beautiful contrivance which dispenses with the usual corrections for temperature, and enables the barometer to give at once its reduced or corrected value. The principle is discussed by M. Van Rysselberghe in his original paper in the volume of the *Bulletins de l'Académie Royale de Bruxelles* for 1873; and I need only describe it in general terms, by saying that in a syphon barometer such as is used in the meteorograph, the quantity of mercury in the instrument may be so adjusted to the diameter of the tube, that the level of the mercury in the shorter or open arm of the tube is unaffected by changes of temperature. In the open arm of the tube, therefore, the changes of level take place under changes of pressure only. The reading of the barometer is communicated by an arrangement similar to that already described in the case of the thermometers; viz., by a steel cylindrical probe which

descends until it makes contact with the mercury, closing the regulating current which, in this case acting on an electro-magnet, completes the burin circuit, and causes the withdrawal of the graver.

Lastly the counter of the revolutions of the anemometer cups is recorded. The cups of the anemometer complete the circuit of a branch of the regulating current, once in each revolution; and this current, acting on a ratchet connected with the mechanism below, causes a graduated metallic rod to be pushed up through staples in which it works stiffly, as long as the recording mechanism is not in action. But coincidently with the last part of the revolution of the recording cylinder, a catch, in descending, makes contact with a projection on the graduated metallic rod, brings the latter back into its initial or zero position, and during the time of contact completes the regulating current, which cuts off the engraving current, and allows the burin to engrave a line of length proportionate to the displacement of the rod.

Dr. A. F. R. HOERNLE exhibited some copper coins and some antiquities found in the ruined town of Khokhrakote lying a short distance to the north of the present town of Rohtak and read the following account of their discovery written by Durga Pershad, Tehsildar of Rohtak.

"Although nothing has to the present day been discovered either from inscriptions, engraving or plates, which in ancient times used to be put into foundations of buildings, to shew the year in which the towns of Rohtak, Khokhrakote, Lalpur and Brahma were built, tradition gives the following brief account.

"This ruined town of Khokhrakote is situated to the north of Rohtak and thousands of years have passed since it was ruined.

"It is said that the town of Rohtak was founded a few thousand years ago by Raja Rohtas, son of Raja Prichand, that it has derived its name from him, and that on the side of Khokhrakote was built an extensive fort with a small population. This population on the foundation of Rohtak gradually disappeared, and the materials of the fort were removed for the construction of another to the east of the town of Rohtak which is now inhabited by 'Sheikhs.'

"It is also said that this ruined town of Khokhrakote, besides the fort alluded to above, consisted of houses of the employes of the State, a market with a few shops of workmen forming a cantonment, and palaces of petty Nawabs and persons of substance, but that from the time of Raja Rohtas it has ceased to be inhabited.

"Another tradition says that it was ruined some time before the foundation of the town of Rohtak.

"These two traditions, therefore, almost entirely correspond with one

another, as, if at the time Rohtak was inhabited, there was a fort at Khokhrakote, it is very probable that it must have been dismantled and the materials removed to Rohtak.

"To the west of Rohtak lies the town of Lálpur, which is said to have been founded by Lálchand Seth a millionaire, and was mostly occupied by money-dealers (Mahájans) and Bráhmans, with a small number of Khatries.

"In Sambat 1772 this town had succumbed to an overflowing of a branch river named "Chomang", owing to the inundation of the Jamna river. The marks as to the existence of the former are still visible in the neighbourhood of maúzás Sámghi and Kheri Ballab, by the presence of a few bridges and the uneven ground on which it flowed. The present Goháná canal which runs towards this ruined town of Lálpur, into the Rohtak Parganá, has also been constructed on the bed of the said river.

"Large bricks are dug out from the ruined buildings of this town and used in building others at Rohtak.

"With a view to discover objects of antiquity, the Commissioner of the Division and Mr. Wood, Deputy Commissioner, in September or October 1879, inspected these ruined towns and proposed to dig the mound, close to the remains of the old fort, called "Nawabi tilá" by the residents of Rohtak, by reason of its being supposed to be the site on which the palaces of the Nawábs were formerly situated, and also on account of its being the highest of all the mounds in this ruinous tract.

"In November 1879, the District Committee sanctioned an expenditure for the digging of this mound. It was first dug to a depth of 8 or 10 feet below the surface, when a large quantity of earth, which seemed as if it had been thrown in, was dug out, and then ruined walls were disclosed and a quantity of interesting relics, such as pieces of earthen vessels, bones, and rusty iron, as also a few shells. At about 15 feet lower down, the foundations of the walls were at an end, and again earth as above noted was dug out. The diggings continued for 7 or 8 feet, when a second set of ruined walls was discovered and a small room which contained some decayed jawár grain which on being touched at once became dust. This, and an image which, from being disfigured by decay, could not be made out, but presumably of a deity, the face being very much like the representation of Buddhá, were found amongst debris and earth. The foundations of the second set of walls having ended at a depth of about 6 or 7 feet, the remains of a third set of walls appeared at about a depth of 38 feet, and when dug to about 6 feet, a small earthen pot, with the mouth covered over with mud, containing some small coins, was found. On the evening of 3rd January 1881, these coins with other relics, shells &c., that were discovered from the mound in question at Khokhrakote, were produced before His Honor the Lieutenant-Governor when encamped at Rohtak. His Honor

after inspection was pleased to order a few of the coins to be sent to him, together with an account as to their discovery.

"The excavations were carried on to a depth of 60 feet, and the expenditure incurred was Rs. 459."

Dr. Hoernle observed that there was some uncertainty as to the real depth to which the excavations were carried. At the end of the account, it was stated that the depth was 60 feet, but the amount of the depths of the several diggings previously detailed in the account was much larger, about 80 feet.

With regard to the coins, he remarked that they appear to be late Indo-Scythic. In Prinsep's *Indian Antiquities*, p. 417 (Plate XXXIV, Nos. 11, 12, 13) they are classed as Indo-Sassanian; but wrongly. They have no trace of the characteristic Sassanian fire-altar, nor of the head of the king in profile. On plate VIII, No. 8 and Plate IV, No. 10 (*ibidem*), they are classed as Indo-Scythic, which they undoubtedly are, or rather probably late imitations of them. This is shown by the characteristic "Šiva and bull" on the reverse, so well known from the coins of Kadphises and Vasudeva (see *Ariana Antiqua*, Plates X, No. 12, XIV, No. 14). The deterioration from the original type can be distinctly traced, in the present series of coins, on the obverse (see facsimile woodcuts). The coins of Kadphises and Vasudeva have, on the obverse, the full figure of the king with a trident in front.



The full figure is still clear on No. 1 (compare No. 10 on Plate IV of Prinsep's *Indian Antiquities*, Vol. I); on No. 2 it has shrunk into mere crude outlines; in Nos 3 and 4 the outlines are still more attenuated; in Nos. 5 and 6 the trident may be seen in front of the skeleton figure, on

the right; in No. 7 the same on the left. The reverse of No. 1 resembles that of No. 2. The reverses of Nos. 4, 5, 7 resemble that of No. 3. In No. 6 the same deteriorating process may be observed on the reverse; the man and bull having been attenuated to mere outlines. It may be noted that on Vasudeva's coins, there is a trident in front of the king on the left, and another in his hand on the right; and further, that the final skeleton (as in Nos. 4 and 5) closely resembles the old Nāgarī characters *नो* (*i. e.*, क + न + ॐ in conjunction), which are very much like the characters that are seen under the arm of the king (in full figure) in the earliest Gupta coins (*e. g.*, of Ghatotkacha). This fact would seem to link the present coins on to the Gupta coins.

The antiquities consisted of 16 pieces; *viz.*, 3 images, 2 pieces of rusty iron, 2 pebbles, 3 globular stones, 3 shells (*cowries*), 4 pieces of "ivory" ornaments. One of the images is a rude, hollow iron figure, broken in 3 pieces representing a squatting man with a top-knot and long pendent ears, another is a very rude full-sized male figure, bow-legged and with arms a-kimbo, unclothed; apparently a votive figure or a mere child's toy. The third is the full male figure of a divinity, cut in low relief on a small flat piece (apparently) of the well-known Agra soap-stone, with head-dress, necklace and sacred thread, both arms turned upwards and each supporting some conical object. Of the two pebbles one is the exact half of a well-turned globe; the other is in its natural form. The three globular stones are really spindle-whorls made of clay, of the volcano-shaped kind, described and figured by Mr. Rivett-Carnac in the *Journal Asiatic Society, Bengal*, Vol. XLIX, page 127. The four so-called "ivory" pieces are the broken parts of two armlets. They are not of ivory, however, as described by the finders, but of conch-shell, as pointed out by the Natural History Secretary.

Mr. BALL, Officiating Natural History Secretary, exhibited samples of the sticks used in the hilly districts of Bengal, for producing fire and in connection with them made the following remarks:

Some years ago I exhibited a sample of the fire sticks used by the inhabitants of the Nicobar islands; these were cut from some soft white wood, possibly from a species of *Bombar*. Subsequently in Sambalpur I found that the inhabitants of the jungles there knew how to make fire in exactly the same way, the sticks used being either of the small solid bamboo or the branches of the *pothur* tree (*Oroton oblongifolium*). In this case my attention was drawn to the fact by finding sticks which had been so used cast away in the jungles. On asking the coolies with me whether they understood the art, they immediately set to work in the following manner.

Breaking off two pieces of dry bamboo which had about twice the diameter of an ordinary lead pencil, they pointed one of them at one end, and on the side of the other they made a small pit to receive the point; from the pit a groove or notch was cut across on the side of the stick. This second stick being placed horizontally in position on some dry grass and leaves, was held there by the toes of the principal operator who squatted down for the purpose. Taking the first stick between the palms of his hands and placing the point in the pit, by rubbing his palms together the stick was made to revolve backwards and forwards, and the second operator relieved the first by commencing at the top as the other worked down to the bottom. They continued thus alternately relieving one another, till, in an incredibly short space of time, the pit became charred and soon began to smoke, the fine dust resulting from the friction falling down the already mentioned slit formed a small pile on the tinder and caught the first spark. This being carefully nursed and blown upon, soon burst into a flame.

At the ethnological section of the British Association meeting in 1878 I exhibited and described some of these sticks and the communication appeared to excite a considerable degree of interest. This, added to the fact that I have found that even in India many people are not aware that the knowledge of how to produce fire with two small sticks, so far from being extinct, is probably universal throughout some wide tracts in this country—has led me to make further enquiries. On the only two occasions upon which I have been in the jungle this year I have asked the first regularly jungly men I met with whether they could make fire; both replied in the affirmative and made good their words by producing a flame in a very short space of time. The first case happened not many miles distant from Deoghur; here the sticks used were the already mentioned *pothur* (*Croton oblongifolium*): these are now exhibited. The second case occurred in the centre of the Kharakpur Hills where I came across a tribe of people called Naya. Their headman, who, by the way, was a most curious and amusing individual, on being asked to produce fire sent one of his companions for the sticks to the jungle close by. He returned, not with the *pothur*, but with the woody stems of a thorny creeper. The thorns having been removed, a pit was made at a node or joint, and then, in the usual way, a very few turns produced a spark; these sticks I also now exhibit. This creeper has three native names, *Kumari* (or *Kumree*) *Dahnee* and *Maskanti*; although I omitted to get leaves or flowers I am fully satisfied that it is a species of the genus *Smilax* and in this opinion Dr. Feistmantel agrees with me. Most of the common species of *Smilax* have scarcely got woody stems, and in this one it is noteworthy that the wood much more closely resembles that of an Endogenous, than that of an Exogenous plant.

So anomalous are the characters of the genus that Lindley long ago proposed a special class, the Dietyogens, for its reception. Among its anomalous characters I do not know whether its woody structure has been specially noticed.

There is every probability that this *Smilax* was the so-called Vine which was known to the ancients as affording the wood with which fire was produced.

Dr. Feistmantel has called my attention to a passage in Sir Emerson Tennent's 'Ceylon' (Vol. II, p. 451) in which the Veddahs are described as making fire in this way with the pieces of an arrow which they broke in two for the purpose.

Mr. Tawney referred to Professor Kuhn's 'Herabkunft des Feuers und des Göttertranks', and mentioned that it appeared from passages quoted by that writer from Greek and Latin authors, that the wood of certain creepers was preferred for kindling fire by friction. Theophrastus states that the lower of the two pieces of wood should be made of ivy, or of a creeper named ἀβραῖν, resembling the wild vine. Pliny also tells us that *edera* and *vitis Silvestris*, *alia quam labrusca*, et *ipsa edera modo arborem scandens* were preferred for the lower of the two fire-sticks, or πυρῆα as they were called by the Greeks.

It was therefore very interesting to observe that the fire-sticks exhibited by Mr. Ball appeared to be made of the wood of a creeper, and a creeper resembling in appearance the wild vine. Among the Greeks and Romans the upper stick or borer was frequently made of laurel. But it is also stated that both sticks were often of the same wood, and the wood of the thorn, the ilex, and the linden seem also to have been used. Kuhn points out that Greek, Roman, and Indian accounts represent the process of attrition as performed by the help of a thong, and not as Mr. Ball saw it, with the hands alone.

The following papers were read—

1. *On the Relations of Cloud and Rainfall to Temperature in India, and on the opposite variations of Density in the Higher and Lower Atmospheric Strata.* By H. F. BLANFORD, F. R. S., *Meteorological Reporter to the Government of India.*

(Abstract.)

The paper treated of two subjects, which had been incidentally discussed in the author's official Report on the Meteorology of India in 1879,

but which, being of general and not merely temporary interest, the author had thought desirable to recast as the subjects of a special paper for the Society.

The first of these was a discussion of the circumstances which mainly determine those marked variations of temperature, that characterize the corresponding seasons of different years in India. Adverting to a paper recently communicated to 'Nature' by Mr. Douglas Archibald, in which Mr. Archibald had shown some reasons for inferring that the cyclical variations of rock-temperature, brought to light by Prof. Piazzzi Smythe, were determined by corresponding cyclical variations of cloudiness in the atmosphere, the author remarked that this view was in part identical with that which he had originally suggested in a paper read before the Society in June 1875; wherein he had endeavoured to show that the temperature of the lower atmosphere on the land surface, in India, depends more on the quantity of cloud and rainfall, than on variations of the solar intensity. Evidence bearing on this subject, drawn from the meteorological observations of the last 6 years, was then brought forward. The temperature of the air and ground as observed at Calcutta in the first five months of 1879 was contrasted with the corresponding temperatures of 1880, and the difference shown to accompany marked variations in the cloud and rainfall. Similar evidence was obtained when the temperature of the N. W. Provinces in the hot months and rains respectively of the years 1877 and 1879 were compared, the variations of the two seasons being in opposite directions in the two years compared; and these were shown, in like manner, to have accompanied very striking variations in the cloud proportion and rainfall.

The action of the different agencies which most powerfully influence temperature at different seasons was discussed briefly, with the result that, only in November and December, is the effect of cloud to raise the temperature above the normal value. At all other seasons, the effect is the opposite, and hence abnormally cloudy and rainy years are abnormally cool years.

The second subject discussed was the variations in the density of the lower and higher strata of the atmosphere, as shown by a comparison of the barometric pressures at hill stations with those on the plains. It was shown that, in many cases, the density of the lower strata of the atmosphere was below the average, when the barometric pressure as a whole was in excess of the average, and *vice versa*; indicating that the higher strata must have an anomaly of the opposite character to that of the lower. It was also shown that a similar opposition of conditions is of annual recurrence at the setting in of the rains, and that it might therefore be probably traceable to some definite play of physical causes. Then adverting to a former discussion, in which it had been shown that the principal cause

affecting the density of the atmosphere is change of temperature, after referring to a recent paper by Mr. Douglas Archibald in the Journal of the Meteorological Society of London, in which this view had been revived and established, some additional evidence was adduced in its support; and it was finally pointed out that, while, as shown in the former part of this paper, the action of cloud and rain was to lower the temperature of the lower strata of the atmosphere, their effect on the higher strata would probably be of the opposite character, which would explain and reconcile the apparent barometric anomaly in question.

This paper will be published in the Journal, Part II.

2. *Description of a Raingauge with Evapometer for remote and secluded stations (with a Plate).*—By H. F. BLANFORD, F. R. S., *Meteorological Reporter to the Government of India.*

(Abstract.)

The paper described a raingauge, intended for use at stations at which there was no resident observer, and which could only be visited at intervals of a month or more; such as were certain hill-tops and stations in forest tracts. The idea had been suggested by Mr. Hutchins of the Mysore Forest Department in an official letter, which had been sent to the author for report. He had made some additions to the design sent up by Mr. Hutchins, and a gauge had been constructed in accordance with the modified design at the Mathematical Instrument Department, and had been subjected to a year's verification at the Alipore Observatory. The result of this verification was now communicated to the Society.

The gauge only differed from an ordinary raingauge in having a very large receiver, capable of holding about 30 inches of rainfall. The receiver was surrounded by an outer casing to diminish evaporation, and, in use, was buried in the ground, the mouth being about one foot above the ground level. Accompanying it, was a smaller vessel of the same diameter, but much shallower, and covered with a conical lid having a small perforation at the apex; which was protected by a small conical cap, to prevent the entrance of rain. This served as an evapometer. In use a measured quantity of water (say = 2 inches of rainfall) was placed in both vessels, and they were then left undisturbed for a month. At the end of that time, the quantity in each vessel was remeasured. The additional water in the gauge being added to the loss in the evapometer was assumed to be the total rainfall of the interval.

A year's verification at Alipore, where the rainfall was also measured daily, showed that the instrument was less accurate than had been hoped,

but was nevertheless calculated to give an approximate result when great accuracy was not important. It had been found that the evaporation from the evapometer exceeded that from the gauge by quantities varying from $\frac{1}{2}$ inch to $\frac{3}{4}$ inch in different months, and the total error in ten months amounted to $4\frac{1}{2}$ inches. The cause of the error being obvious, it appeared probable that it might be greatly reduced or even corrected by increasing the depth of the evapometer, and by enlarging the conical cap, which would diminish the evaporation.

This paper will be published in the Journal, Part II, with a Plate.

3. *On some Lepidopterous Insects belonging to the Rhopalocerous Genera Euripus and PentHEMA from India and Burmah.*—By J. WOOD-MASON, Deputy Superintendent, Indian Museum.

This paper will be published in the Journal, Part II, No. 2 for 1881.

4. *A list of Butterflies taken in Sikkim in October 1880 with notes on habits, &c.*—By LIONEL DE NICEVILLE.

This paper will be published in the Journal, Part II, No. 1 for 1881.

The following communication has been received—

On the Revenues of the Mughul Empire.—By H. G. KEENE, C. S.

LIBRARY.

The following additions have been made to the Library since the meeting held in March last.

TRANSACTIONS, PROCEEDINGS AND JOURNALS,

presented by the respective Societies and Editors.

Bombay. The Indian Antiquary,—Vol. X, Parts 116 and 117, March 1881.

Bordeaux. Société de Géographie Commerciale,—Bulletin, Nos. 3, 4 and 5.

Calcutta. Agricultural and Horticultural Society of India,—Journal, Vol. VI, Part 3.

Lennox, P. de Laval.—Remarks on Cattle disease in the district of Kangra, its treatment and remedy. Notes on the preparation of the Rhea Fibre, by certain residents of the Bhagulpore district. Communicated by the Government of Bengal. *Sandys, T.*—Remarks on Rhea cultivation and preparation. *Fogson, Capt. J. F.*—Notes on the introduction of certain Food Grains and Economic Plants into the Himalayas. Notes on some neglected Fibres. Trees yielding India Rubber.

- Leipzig. Deutsche Morgenländische Gesellschaft,—Zeitschrift, Vol. XXXIII, Part 4, 1880.
- Lille. Union Géographique du Nord de la France,—Bulletin, Nos. 1—5, July to November 1880.
- London. Royal Asiatic Society of Great Britain and Ireland,—Journal, Vol. XIII, Part 1, January 1881.
- . Statistical Society,—Journal, Vol. XLIII, Part 4, December 1880.
- . Royal Microscopical Society,—Journal, Vol. I, Part 1, February 1881.
- Summary of current Researches relating to Zoology and Botany (principally Invertebrata and Cryptogamia) Microscopy, &c., including original Communications from Fellows and others.
- . Royal Geographical Society,—Proceedings, Vol. III, Nos. 1—2.
- . Institution of Mechanical Engineers,—Proceedings, No. 4, 1880.
- . Royal Astronomical Society,—Monthly Notices, Vol. XLI, Nos. 2 and 3.
- . ———. Memoirs,—Vol. XLV, 1879-80.
- . Nature,—Vol. XXIII, Nos. 590, 592 and 593.
- . The Athenæum,—Nos. 2781—2785.
- . The Academy,—Nos. 457—462.
- Lyons. Société de Géographie,—Bulletin, Vol. III, No. 19.
- Manchester. Literary and Philosophical Society of Manchester,—Memoirs, Vol. VI.
- . ———. Proceedings, Vols. XVI, XVII, XVIII, and XIX.
- Moscow. Société Impériale des Naturalistes,—Bulletin, Vol. LV, No. 2, 1880.
- Sévertzow, Dr. N.*—Études sur le passage des oiseaux dans l'Asie Centrale particulièrement par le Ferghânah et le Pamir.
- Paris. La Société de Géographie,—Bulletin, Vol. XX, December 1880.
- Pisa. Società Toscana di Scienze Naturali,—Atti, Processi Verbali, 9th January 1881.
- Rome. Società degli Spettroscopisti Italiani,—Memorie, Dispensa 10—11, October und November 1880.
- Schaffhausen. La Société Entomologique Suisse,—Bulletin, Vol. VI, No. 2.
- Simla. United Service Institution of India,—Journal, Vol. IX, No. 46, 1880.
- St. Petersburg. Russian Geographical Society,—Proceedings, 1879.
- . L'Académie Impériale des Sciences de St. Petersbourg,—Bulletin, Vol. XXVI, No. 2.
- Martens, E. V.*—Mollusques recueillis en Arménie par M. Alexandre Brandt.
- . ———. Memoires,—Vol. XXVII, Nos. 5—12.
- No. 5. *Moller, Valerian V.*—Die Foraminiferen des Russischen Kohlenkalks.
- No. 7. *Schrenck, Dr. Leop. V.*—Der Erste Fund einer Leiche Von Rhinoceros Marokii Jaeg.

- No. 8. *Bunge, Al.*—Pflanzen-geographische betrachtungen über die Familie der Chenopodiaceen.
- No. 10. *Hser, Dr. O.*—Nachträge zur Jura-Flora Sibiriens gegründet auf die von Herrn Richard Maak in Ust-Balei gesammelten Pflanzen.
- No. 12. *Abich, H.*—Ein Cylcus Fundamental der Barometrischer Höhenbestimmungen auf dem Armenischen Hochlande.
- Vienna. Kaiserliche Akademie der Wissenschaften, Archiv für österreichische Geschichte,—Vol. XL, Part 2; Vol. XLI, Parts 1—2; and Vol. XLII, Part 1.
- . ———. Sitzungsberichte, — Philosophisch-historische Classe, Nos. 2 and 3, Vol. XCVI.
- . ———. Sitzungsberichte,—Mathematisch-Naturwissenschaftliche Classe, Part I, Vol. LXXXI, Nos. 1—5; Vol. LXXXII, Nos. 1—2: Part II, Vol. LXXXI, Nos. 4—5; Vol. LXXXII, Nos. 1—2: Part III, Vol. LXXXI, Nos. 4—5; Vol. LXXXII, Nos. 1—2.
- Vol. LXXXI, Pt. I, Nos. 1-4. *Fuchs.*—Ueber einige tertiäre Echiniden aus Persien.
- . Pt. I, No. 5. *Touta.*—Geologische Untersuchungen im westlichen Theile des Balkan und in den angrenzenden Gebieten.
- Vol. LXXXII, Pt. I, No. 1. *Sieber.*—Zur Kenntniss der nordböhmisches Braunkohlenflora.
- . Pt. I, No. 2. *Steindachner.*—Ueber eine neue Pythonart (*Python Breitensteini*) aus Borneo.
- Vol. LXXXII, Pt. III, Nos. 1-2. *Langer.*—Die Foramina Thebesii im Herzen des Menschen.
- Vienna. Kaiserliche Akademie der Wissenschaften,—Sitzungsberichte, Mathematisch-naturwissenschaftliche Classe, Register, zu den Banden 76 Bis 80.
- . ———. Denkschriften,—Mathematisch-naturwissenschaftliche Classe, Vols. XL and XLII.
- Vol. XLII. *Hoernes.*—Materialien zu einer Monographie der Gattung *Megalodus* mit besonderer Berücksichtigung der mesozoischen Formen.
- . ———. Almanach 1880.

BOOKS AND PAMPHLETS,

presented by the Authors.

- CERNUSCHI, H. Bi-Metallism at 15½ a necessity for the Continent, for the United States, for England, 8vo., London, 1881. Pam.
- LEITNER, DR. G. W. A detailed Analysis of Abdul Ghafur's Dictionary of the Terms used by Criminal Tribes in the Panjab. Fcp., Lahore, 1880.
- . A sketch of the Changars and of their Dialect. Fcp., Lahore, 1880.

MISCELLANEOUS PRESENTATIONS.

Proceedings of the Californian Academy of Sciences at a Reception given to the Capt. and Officers of the U. S. Steamer "Thomas Corwin" and Captains of the Pacific Whaling Fleet on their return from the Arctic. 8vo San Francisco, 1880.

PEIRCE, H. A. Early discoveries of the Hawaiian Islands in the North Pacific Ocean. 8vo., San Francisco, 1880.

CALIFORNIAN ACADEMY.

MITRA, TROILOKYANATH. Tagore Law Lectures, 1879. The Law Relating to the Hindu Widow. 8vo, Calcutta, 1881.

THE CALCUTTA UNIVERSITY.

Report on Municipal Taxation and Expenditure in the Lower Provinces of Bengal, for the year 1879-80. Fcp., Calcutta, 1880.

WARDLE, T. The Wild Silks of India, principally Tusser. Fcp., London, 1880.

BENGAL GOVERNMENT.

BURNELL, A. C. A classified Index to the Sanskrit MSS. in the Palace at Tanjore. 4to., London, 1880.

MADRAS GOVERNMENT.

Société de Géographie. Rapport Annuel, Séance Solennelle, 23rd December 1880. 8vo., Lyons, 1881.

GEOGRAPHICAL SOCIETY OF LYONS.

Report on the Judicial Administration (Civil) of the Central Provinces for the year 1880. Fcp., Nagpur, 1881.

CHIEF COMMISSIONER, CENTRAL PROVINCES.

Records of the Geological Survey of India, Vol. XIV, Part 1, 1881. 8vo. The Indian Antiquary, Vol. X, Parts 116 and 117, March 1881. 4to., Bombay, 1881.

HOERNLE, DR. A. F. R. A comparative Grammar of the Gaudian Languages, with special reference to the Eastern Hindi. 8vo., London, 1880.

HOME, REVENUE, AND AGRICULTURAL DEPARTMENT.

Deutsche Litteratur Zeitung, Nos. 5 and 6, of 1880. 4to., Berlin, 1880.

HINCKS, REV. DR. On the Khorsabad Inscriptions (from Transactions, Royal Irish Academy). 4to., Dublin, 1850.

DR. A. F. R. HOERNLE.

HAGGERSTON, W. J. Newcastle-upon-Tyne, Public Libraries. Catalogue of the Books in the Central Lending Department. 8vo., Newcastle-upon-Tyne, 1880.

———. Newcastle-upon Tyne, Public Libraries. Catalogue of the Books in the Juvenile Lending Department. 8vo., Newcastle-upon-Tyne, 1880.

NEWCASTLE PUBLIC LIBRARIES.

PERIODICALS PURCHASED.

- Benares. Fallon's new English-Hindustani Dictionary, Part 2, March 1881.
- Berlin. Journal für reine und angewandte Mathematik,—Vol. XC, Nos. 3—4.
- Calcutta. Indian Medical Gazette,—Vol. XVI, Nos. 2 and 3, February and March 1880.
- Göttingen. Gelehrte Anzeigen,—Nos. 5—11.
- . Nachrichten,—Nos. 2—5.
- Leipzig. Annalen der Physik und Chemie,—Vol. XII, Part 2.
- . Beiblätter,—Vol. V, No. 2.
- London. Quarterly Review,—Vol. CLI, No. 301, January 1881.
- . Westminster Review,—Vol. CXV, No. 227, January 1881.
- . Edinburgh Review,—Vol. CLIII, No. 313, January 1881.
- . Publishers' Circular,—Vol. XLIV, Nos. 1042—1043.
- . Nineteenth Century,—Vol. IX, Nos. 47—48.
- . Messenger of Mathematics,—Vol. X, Nos. 8—9.
- . Quarterly Journal of Pure and Applied Mathematics,—Vol. XVII, No. 67.
- . Mind,—No. 21, January 1881.
- . Quarterly Journal of Microscopical Science,—Vol. XXI, No. 81.
- Brady, H. B.*—Notes on some Reticularian Rhizopoda of the "Challenger" Expedition. *Dowdeswell, G. F.*—On some appearances of red blood-corpuscles of Man and other Vertebrata.
- . Journal of Science,—Vol. III, Nos. 85—86.
- . American Journal of Science,—Vol. XX, No. 120.
- . Ibis,—Vol. V, No. 17.
- Forbes, W. A.*—On the Contributions to the Anatomy and classification of Birds made by the late Professor Garrod. *Ramsay, Capt. R. G. W.*—Description of two new species of Birds. *Biddulph, Maj. J.*—On the Birds of Gilgit. *Shelley, Capt. G.*—On new species of East African Birds. *Gurney, J. H.*—A List of Birds collected at or near Mombasa, East Africa. *Layard, E. L.* and *Layard, E. L. C.*—Notes on the Avifauna of New Caledonia and the New Hebrides. *Nicholson, F.* List of Birds collected by Mr. H. O. Forbes in the Island of Java.
- . Journal of Botany,—Vol. X, Nos. 217—218.
- No. 217. *Agardh, J. G.*—Species, Genera et ordines Algarum, seu descriptiones succinctæ specierum, generum, et ordinum quibus Algarum regnum constituitur. *Kuntze, Dr. Otto.*—Ueber Geysirs und nebenan entstehende verkie-selte Bäume.
- No. 218. *Hance, H. F.*—A new Hong Kong Melastomaceæ.
- . Annals and Magazine of Natural History,—Vol. VII, Nos. 37—38.
- No. 37. *Lütken, Dr. C. F.*—Spolia Atlantica: Contributions to the knowledge of the changes of Form in Fishes during their growth and Development, especially in the Pelagic Fishes of the Atlantic. *Thomas, O.*—Description of

a new species of *Mus* from Southern India. *Butler, A. G.*—Description of new species of Lepidoptera in the collection of the British Museum. *Miers, E. J.*—On a small collection of Crustacea and Pycnogondia from Franz-Josef Land, collected by B. Leigh Smith. *Günther, A. C. L. G.*—An Introduction to the Study of Fishes. *Wood-Mason, J.*—On a new species of *Papilio* from South India, with remarks on the Species allied thereto.

No. 38. *Butler, A. G.*—On a collection of Butterflies from Nikko, Central Japan. *Blanford, W. T.*—Note on a Central Asiatic Field-Mouse (*Mus arianus*).

London. London Edinburgh and Dublin Philosophical Magazine,—Vol. XI, Nos. 65—66.

———. The Entomologist,—Vol. XIV, Nos. 212—213.

No. 212. *Gooch, W. D.*—Notes on the Lepidoptera of Natal. *Fitch, E. A.*—The Mangold-fly.

———. The Entomologist's Monthly Magazine,—Vol. XVII, Nos. 200—201.

No. 200. *Meyrick, E.*—Australian gall-making Lepidopterous larvæ. *Sharp, D.*—Reviews: Avis préliminaire d'une nouvelle classification de *Dytiscidæ*. *Edwards, W. H.*—The Butterflies of North America, second series, pt. 9.

No. 201. Notes on *Cucujidæ* in Japan, with diagnosis of a new Species. *Lewis, G.*—Notes from Japan. Observations on *Vanessa* in Japan.

———. Society of Arts,—Journal, Vol. XXIX, Nos. 1472—1477.

———. Chemical News,—Vol. XLIII, Nos. 1107—1111.

Paris. Annales de Chimie et de Physique,—Vol. XXII, January and February 1881.

———. Revue et Magasin de Zoologie,—Vol. VII, Part 2, 1879.

Fieber, F. X.—Les Cicadines d'Europe, traduit par F. Reiber. *Thomson, J.*—Revue du groupe des Psilapterites. *Fairmaire, L.*—Coléoptères du nord de l'Afrique.

———. Revue de Linguistique,—Vol. XIV, Pt. 1, 15th January 1881.

———. Journal Asiatique,—Vol. XVI, No. 3, and Vol. XVII, No. 1.

———. Journal des Savants,—February 1881.

———. Comptes Rendus,—Vol. XCII, Nos. 6—9.

———. Revue Scientifique,—Vol. XXVII, Nos. 6—11.

———. Revue Critique,—Vol. XI, Nos. 6—10.

———. Revue des deux Mondes,—Vol. XLIII, 15th February 1881, and Vol. XLIV, 1st March 1881.

Philadelphia. Manual of Conchology, Part 9.

BOOKS PURCHASED.

ANDERSON, R. Lightning Conductors, their History, Nature and Mode of Application. Roy. 8vo., London, 1880.

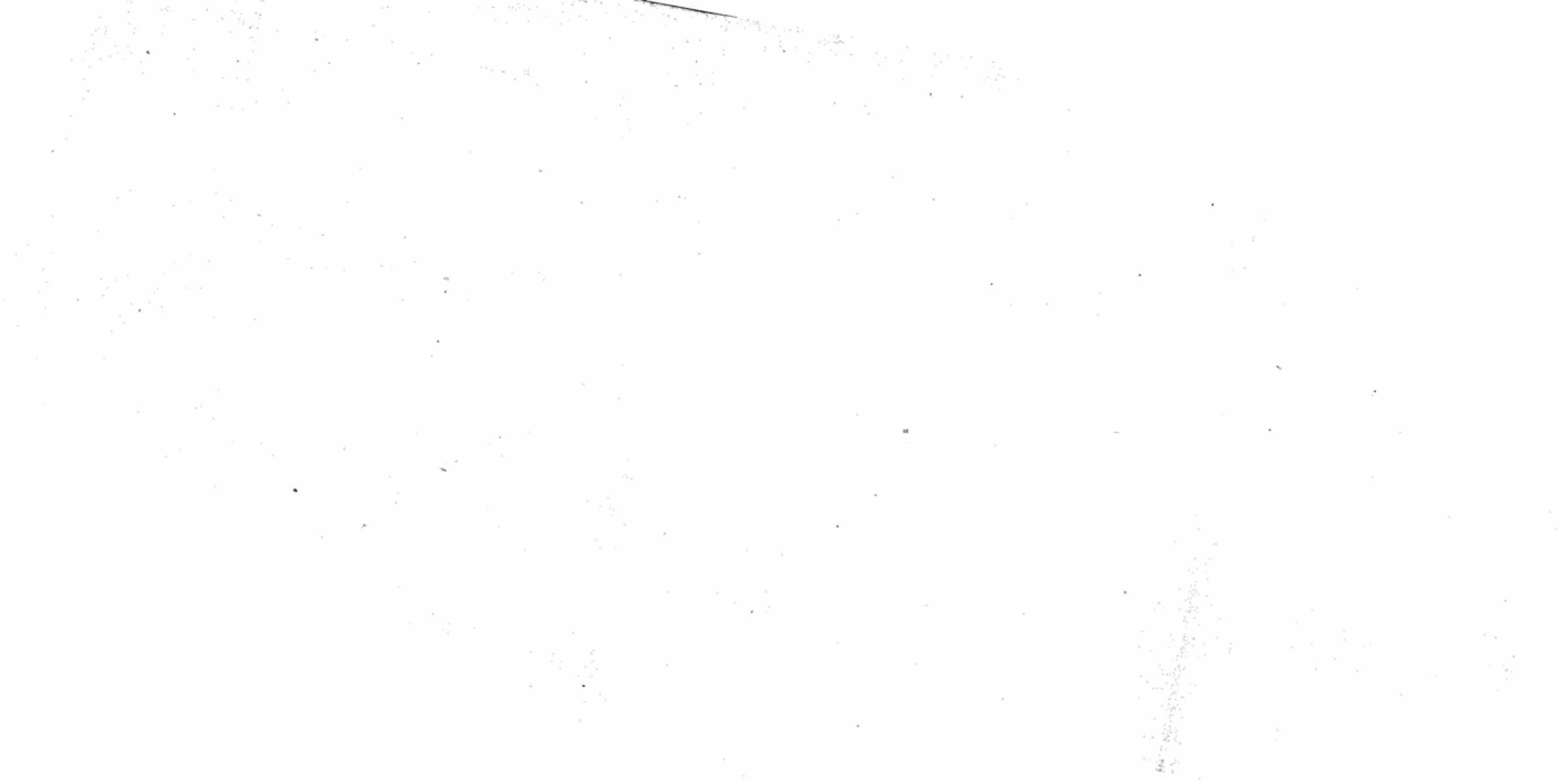
BALFOUR, F. M. A Treatise on Comparative Embryology, Vol. I, 8vo. London, 1880.

- BANESS, J. F. *Index Geographicus Indicus*. 4to., Calcutta, 1881.
- BENTLEY, R. and TRIMEN, H. *Medical Plants, being Descriptions with original Figures of the Principal Plants employed in Medicine and an account of their Properties and Uses*. Parts 12—42 (incl.). 4to., London, 1876-1880.
- BRUGSCH-BEX, DR. H. *A History of Egypt under the Pharaohs derived entirely from the monuments, to which is added a discourse on the Exodus of the Israelites*. Translated and Edited from the German by Philip Smith, B. A. 2 Vols. 8vo., London, 1881.
- . *Hieroglyphisch-demotisches Wörterburch enthaltend in wissenschaftlicher Anordnung und Folge den Wortschatz der heiligen und der Volks-sprache und Schrift der alten Aegypter*, Vol. V. 4to., Leipzig, 1880.
- BUDGE, E. A. *Archaic Classics. Assyrian Texts, being Extracts from the Annals of Shalmaneser II, Sennacherib and Assur-banipal, with Philological Notes*. 4to., London, 1880.
- CLAUSIUS, R. *The Mechanical Theory of Heat*. Translated by W. R. Browne, M. A. 8vo., London, 1879.
- CLIFFORD, W. R. *Lectures and Essays*, edited by Leslie Stephen and Frederic Pollock. Vols. I and II, 8vo., London, 1879.
- DAWKINS, W. B. *Early man in Britain and his place in the Tertiary Period*. 8vo., London, 1880.
- DUTT, SHOSHEE CHUNDER. *India, Past and Present; with Minor Essays on Cognate subjects*. 8vo., London, 1880.
- EDKINS, REV. J. *Chinese Buddhism: A Volume of Sketches, Historical, Descriptive and Critical*. 8vo., London, 1880.
- EGGELING, J. *Sanskrit Text Society. Vardhamāna's Ganaratna-Mahodahi, with the author's Commentary, Part I*, 8vo., London, 1879.
- FABER, REV. E. *Introduction to the Chinese Religion. A Critique of Max Müller and other authors*. 8vo., Hong-Kong.
- GAMGEE, A. *A Text Book of the Physiological Chemistry of the Animal Body*, Vol. I. Roy. 8vo., London, 1880.
- HOUZEAU, J. C. and LANCASTER, A. *Bibliographie Générale de l'Astronomie ou Catalogue Méthodique des Ouvrages, des Mémoires et des Observations Astronomiques publiés depuis l'origine de l'imprimerie jusqu'en 1880*. Vol. II, fasc. 1. Roy. 8vo., Brussels, 1880.
- HOWORTH, H. H. *History of the Mongols from the 9th to the 19th Century, Part II, Divisions 1 and 2*. Roy. 8vo., London, 1880.
- KEANE, A. H. *Monograph on the Relations of the Indo-Chinese and Inter-Oceanic Races and Languages*. 8vo., London, 1880.
- LEGGE, J. *The Religions of China. Confucianism and Tâoism described and compared with Christianity*. 8vo., London, 1880.

- MAXWELL, J. C. The Electrical Researches of the Honourable Henry Cavendish, F. R. S. written between 1771 and 1781; Edited from the original MSS. in the possession of the Duke of Devonshire, K. G. 8vo. Cambridge, 1879.
- MÜLLER, F. MAX. Sacred Books of the East, Vols. IV, V and VII, 8vo., Oxford, 1880.
- OPPERT, DR. G. On the Weapons, Army Organisation, and Political Maxims of the ancient Hindus, with special reference to Gunpowder and Firearms. 8vo., Madras, 1880.
- RENAN, E. The Hibbert Lectures, 1880. Lectures on the Influence of the Institutions, Thought, and Culture of Rome, on Christianity and the Development of the Catholic Church. 8vo., London, 1880.
- RENOUF, P. C. P. The Hibbert Lectures, 1879. Lectures on the Origin and Growth of Religion as illustrated by the Religion of Ancient Egypt. 8vo., London, 1880.
- ROSCOE, H. E. and SCHORLEMMER, C. A Treatise on Chemistry, Vol. I and Vol. II, Parts 1 and 2. 8vo., London, 1878-80.
- SACHAU, DR. C. E. The Chronology of Ancient Nations (of Albiruni). Translated and Edited. Roy. 8vo., London, 1879.
- SAYCE, A. H. Introduction to the Science of Language. Vols. I and II. 8vo., London, 1880.
- SCHÖMANN, G. F. The antiquities of Greece. Translated by E. G. Hardy and J. S. Mann. 8vo., London, 1880.
- SEMPER, KARL. The Natural Conditions of Existence as they affect Animal Life. 12mo., London, 1881.
- SLEEMAN, C. W. Torpedoes and Torpedo Warfare containing a complete and concise account of the Rise and Progress of Submarine Warfare; also a detailed description of all matters appertaining thereto, including the latest Improvements. Roy. 8vo., Portsmouth, 1880.
- SPENCER, H. Descriptive Sociology; or Groups of Sociological Facts, classified and arranged. Hebrews and Phœnicians, by R. Scheppig, Ph. D. Fol., London, 1880.
- STENZLER, A. F. Sanskrit Text Society. The Institutes of Gautama, edited with an Index of Words. 8vo., London, 1876.
- STOKES, MAIVE. Indian Fairy Tales. Collected and Translated. 8vo., London, 1880.
- TRENCKNER, V. The Milindapañho: being Dialogues between King Milinda and the Buddhist sage Nāgasena. Edited. 8vo., London, 1880.
- . Pali Miscellany, Part I, 8vo., London, 1879.



TRACE OF VAN RYSSELBERGHE & SCHUBART'S METEOROGRAPH



PROCEEDINGS
OF THE
ASIATIC SOCIETY OF BENGAL.
FOR MAY, 1881.

The Monthly General Meeting of the Asiatic Society of Bengal was held on Wednesday, the 4th of May 1881, at 9. 15 P. M.

The Hon. H. J. REYNOLDS, C. S., Vice-President, in the Chair.

The minutes of the last Meeting were read and confirmed.

The following presentations were announced—

1. From the Lisbon Geographical Society,—(1) Moçambique, by J. J. Machado, (2) Explorações Geologicas e mineiras nas Colonias Portuguezas, by L. Malheiro.

2. From the Department of the Interior, U. S.—Annual Report of the U. S. Geological and Geographical Survey of the Territories for the year 1877.

3. From the Meteorological Reporter to the Govt. of India—Description et notices sur l' installation et l'entretien des Météorographes Graveurs de von Rysselberghe et Schubart, construits pour compte du Ministère des Indes Britanniques, by Th. Schubart.

4. From the authors,—(1) Notice sur une collection de Monnaies Orientales de M. le Comte S. Stroganoff, by Prof. W. de Tiesenhausen, (2) The Tea Cyclopædia, by F. Wyman, editor of the Indian Tea Gazette.

5. From the Home, Revenue and Agricultural Department,—Selections from the Records of the Government of India, Home, Revenue and Agricultural Department, No. 174.

6. From the Museo Publico of Buenos Aires,—(1) Bericht über die Feier des 50 Jahrigen Doctor Jubilaeums des Prof. Dr. Hermann Burmeister begangen der 19th December 1879 in Buenos Aires, (2) Description Physique de la République Argentine, Vol. III, and Atlas Part 2, by Dr. H. Burmeister.

7. From the Royal Society of New South Wales,—Report of the Council of Education of New South Wales for 1879, (2) Annual Reports of the Department of Mines, New South Wales, for 1878 and 1879.

8. From Dr. A. F. R. Hoernle,—*Bibliotheca Orientalis* for 1877, by R. Frederici.

The following Gentlemen, duly proposed and seconded at the last meeting, were balloted for and elected Ordinary Members of the Society :

J. Cockburn, Esq.

Major E. Molloy.

The COUNCIL reported that Mr. V. Ball had been asked to officiate as Natural History Secretary during Mr. J. Wood-Mason's absence on deputation.

The COUNCIL also reported that Mr. Alexander Pedler had resigned the post of Honorary Secretary and Member of Council and that Dr. H. W. McCann had been appointed in his place.

The COUNCIL also reported that Mr. Pedler had resigned the post of Trustee of the Indian Museum on behalf of the Society and that Mr. J. Eliot had been elected a Trustee.

The SECRETARY reported that Babu Mahendra Chandra Mukhopadhyaya had been appointed as a temporary copyist in the office on Rs. 15 per mensem.

The SECRETARY read the names of the following Gentlemen appointed by the Council to serve on the several Committees during the year 1881.

FINANCE COMMITTEE.

Dr. Rájendralála Mitra, C. I. E.

J. Westland, Esq., C. S.

H. B. Medlicott, Esq., F. R. S.

H. Beverley, Esq., C. S.

J. Eliot, Esq., M. A.

LIBRARY COMMITTEE.

Dr. Rájendralála Mitra, C. I. E.

H. B. Medlicott, Esq., F. R. S.

Col. J. F. Tennant, R. E., F. R. S.

Dr. D. D. Cunningham.

C. H. Tawney, Esq., M. A.

Babu Prannath Pundit, M. A.

H. F. Blanford, Esq., F. R. S.

Dr. O. Feistmantel.

J. Eliot, Esq., M. A.
 H. Beverley, Esq., C. S.
 Dr. Mohendralal Sircar.
 Babu Pratapa Ch. Ghosha, B. A.

PHILOLOGICAL COMMITTEE.

Dr. Rájendralála Mitra, C. I. E.
 C. H. Tawney, Esq., M. A.
 Major-General A. Cunningham, C. S. I.
 J. Beames, Esq., B. C. S.
 F. S. Growse, Esq., M. A., C. S.
 Rev. K. M. Banerjea, LL. D.
 Dr. Mohendralala Sircar.
 Dr. G. Thibaut.
 Hon'ble Whitley Stokes, C. S. I., C. I. E.
 C. J. Lyall, Esq., B. A., C. S.
 G. A. Grierson, Esq., C. S.
 H. Rivett-Carnac, Esq., C. S., C. I. E.
 Nawab Abdul Latif, Khan Bahadur.
 Moulvie Kabiruddin Ahmed.
 Babu Dijendranath Thakur.
 Babu Prannath Pandit, M. A.
 Babu Protapa Ch. Ghosha, B. A.
 Major H. S. Jarrett, S. C.

NATURAL HISTORY COMMITTEE.

Dr. O. Feistmantel.
 A. O. Hume, Esq., C. S.
 G. Nevill, Esq., C. M. Z. S.
 Dr. D. D. Cunningham.
 Dr. G. King, F. L. S.
 Dr. D. Brandis, F. L. S., F. R. S.
 S. E. Peal, Esq.
 R. Lydekker, Esq., B. A.
 Capt. G. F. L. Marshall, R. E.
 L. Schwendler, Esq.
 Dr. T. R. Lewis.

PHYSICAL SCIENCE COMMITTEE.

H. B. Medlicott, Esq., F. R. S.
 Major-General J. T. Walker, R. E., F. R. S.
 H. F. Blanford, Esq., F. R. S.
 A. J. L. Cappel, Esq.

J. Eliot, Esq., M. A.

Col. J. F. Tennant, R. E., F. R. S.

Commander A. D. Taylor.

L. Schwendler, Esq.

F. Fedden, Esq.

COINS COMMITTEE.

Dr. Rájendralála Mitra, C. I. E.

Col. J. F. Tennant, R. E., F. R. S.

Major-General A. Cunningham, C. S. I.

H. Rivett-Carnac, Esq., C. S., C. I. E.

Hon'ble J. Gibbs, C. S. I., C. I. E.

C. H. Tawney, Esq., M. A.

Major W. F. Prideaux, S. C.

The SECRETARY read the following table of predictions for Northern India for the Eclipse of the sun May 16th, 17th, 1882, sent by Col. J. F. Tennant, F. R. S.

ECLIPSE OF THE SUN, MAY 16, 17, 1882.

PREDICTIONS FOR NORTHERN INDIA.

Places.	COMMENCEMENT.		GREATEST ECLIPSE.		END.	
	Mean Time.	Position.	Mean Time.	Magni- tude.	Mean Time.	Position.
	h. m.		h. m.	Digits.	h. m.	
Allahabad	0 „ 24.1	121° R.	1 „ 54.8	6.314	2 „ 15.3	14° R.
Calcutta	1 „ 14.9	142 R.	2 „ 38.8	5.780	3 „ 50.7	20 R.
Delhi	23 „ 48.0	72 R.	1 „ 22.6	7.800	2 „ 49.4	5 R.
Jubbulpore	0 „ 13.2	119 R.	1 „ 42.1	5.687	3 „ 02.8	24 R.
Kurrachee	22 „ 37.1	9 R.	0 „ 08.8	6.730	1 „ 41.1	19 R.
Lahore	23 „ 28.3	61 R.	1 „ 03.0	8.878	2 „ 32.0	4 R.
Lucknow	0 „ 15.6	109 R.	1 „ 47.9	7.154	3 „ 00.5	10 R.
Mooltan	23 „ 07.3	39 R.	0 „ 46.8	7.040	2 „ 14.1	4 R.
Mussooree	23 „ 53.5	82 R.	1 „ 27.4	8.480	2 „ 54.5	1 L.
Patna	0 „ 47.0	133 R.	2 „ 16.0	6.786	3 „ 34.6	12 R.
Peshawar	23 „ 09.7	62 R.	0 „ 44.4	10.136	2 „ 15.9	16 L.
Shillong	1 „ 33.1	142 R.	2 „ 57.8	7.146	4 „ 11.2	8 R.
Simla	23 „ 46.6	78 R.	1 „ 21.7	8.740	2 „ 48.7	3 L.

N. B.—Positions are measured on the circumference of the Sun and to the Right or Left of the Highest point.

DR. HOERNLE exhibited a collection of relics which had lately been found by Mr. Beglar in the course of an excavation carried on in the Great Temple of Buddha Gaya. Permission to exhibit them to the Society had been re-

ceived from the Lieutenant-Governor, shortly before the meeting; and Dr. Hoernle explained that he was not in a position to give more information about them than what he had been able to gather in a short conversation with Mr. Wickes from whom he had received the relics. They were said to have been found in the Great Temple at a spot where according to local tradition the throne of Aśoka once stood, after digging to a depth of about 20 feet. They consisted of fragments of various kind of gems, corals, gold and silver foil, small pearls, &c. A very large number of them were perforated, showing apparently that they were originally strung on threads. Dr. Hoernle added, that it appeared to him that the theory of their connexion with Aśoka's throne required a great deal of confirmation; and that it would be well to wait for General Cunningham's report, to whom, he understood, the relics had been already submitted, before accepting the local tradition.

Mr. Ball, who had examined the relics, concurred with Dr. Hoernle as to the doubtfulness of their connection with any throne of Aśoka. The result of his examination, as communicated in a letter after the meeting, is as follows:

"The collection includes sapphires, (whole and broken), rubies, emeralds (broken), pearls, coral, cornelian, garnet, quartz crystals, lapis lazuli, &c. There are also some heart-shaped pieces of emerald-like glass which have become crusted over from lying in the soil.

"There are at least two specimens, one large, of a rare mineral called Iolite or Dichroite. These have been identified by Mr. Mallet to whom I shewed them. They at first sight look like sapphires.

"The larger one would be a valued specimen in our mineralogical collection if it could be obtained.

"The smashing of the sapphires into small pieces is remarkable. There are a few, however, which are intact."

Mr. WESTLAND exhibited four old maps of Calcutta and Bengal which he explained had been lithographed for issue with Mr. Sandeman's continuation of Mr. Seton-Karr's extracts from old Calcutta Gazettes. Mr. Sandeman had left them behind him, in his, now Mr. Westland's, office, and Mr. Westland thought he would best dispose of them if he offered them to such members of the Society as had any interest in the subject.

The first was a map of the Sunderbuns in 1724, apparently a rough sketch by some Dutch skipper. It had been occasionally referred to as evidence of the extension of cultivation in these regions; but some difficulties had been found in identifying some of the settlements named in it. One of them called "Cuipitavai" he identified as "Khalifatabad" the pergunna in which Bagahat was situate, near which there were some ancient and large buildings, indicating an early cultivating settlement. "Noldy" farther east

was no doubt meant for Pergunna Nuldi in Jessore, which, however, was a good way north of its position in the map, and did not properly belong to the Sunderbuns at all. The "Jessore" mentioned in the map was probably either the original "Jessore" in the 24-Pergunna district, or the place now known as Khoolna. The present "Jessore" was not known by that name till 1780 or 1790 at the earliest.

Another map was a reproduction of a map of Bengal engraved in 1776 from surveys in 1769. Mr. Westland drew attention to the fact that the various districts all bore their territorial names as distinguished from their official ones,—thus, Pachete for Manbhoom, Ramgur for Hazaribagh. He drew attention also to the great change in the Gangetic Delta which had occurred since the date of the map. The Brahmaputra river which the map shewed as flowing east of the Maddapur jungle, Dacca, and the Gangetic Delta, now flows west of the jungle and Dacca, and breaks in on the north of the Delta. He connected this with another change of which he had independent historical evidence, namely, the opening of the Madhumati branch of the Ganges, a petty stream in this map, but now receiving by far the largest share of the Ganges water. The Ganges had now ceased to find its way farther east, being interrupted and thrown back by the irruption of the altered Brahmaputra into the Megna. He dated these changes between 1795 and 1805, which were years of excessive inundation in the northern district of the Madhumati.

The two other papers were, one a sketch of Calcutta in 1756, and the other a plan of it in 1757. He drew attention to the grouping of the settlement round the Fort (on the present Customs House site) and the Park (now Tank or Dalhousie Square); and to the creek running up along the line now occupied by the High Court, Government House, and Dhurumtolla; the recollection of which he believed was still preserved in the name of a small street "Creek Row".

Mr. Beverley said that the two maps of Calcutta exhibited by Mr. Westland were apparently reprints of maps that were first published in Orme's *History of the War in Bengal*. They had been treated of by him (Mr. Beverley) in para. 104 of his *Report on the Census of the Town of Calcutta* (1876), which he read. Mr. Beverley believed that all the old maps of the Town now in existence in Calcutta had been referred to in that *Report*. He had hoped that Mr. Westland had come across Holwell's map of 1756, described by him in a letter to the Court of Directors as "an exact plan of your Settlement and of every house in it." That map ought to be in the India Office, and its publication would throw considerable light on the early history of the town. Possibly the Society might take steps to have it traced out, and to have copies sent to this country.

The following papers were read—

1. *On the Revenues of the Mughul Empire.*—By H. G. KEENE, C. S.

(Abstract.)

The Journal of the Asiatic Society of Bengal, Part I, No. IV, 1880, contained a paper by Mr. C. J. Rodgers on the copper coins of Akbar. The object of the present paper is to show that Mr. Rodgers' views regarding the amount of Akbar's revenue are not tenable, and for this purpose various evidence is adduced from historical writings (*e. g.*, the *Bádsháh-námah*) and general considerations. The conclusion at which the author arrives is, that "ten krores are the right figure of Akbar's Revenue, and that the *murádi tankah* is neither the one-fifth of a *dám*, nor the modern 'double pyce,' but an imaginary integer of copper accounts, whereof sixty-four equal one silver Rupee."

This paper will be published in the Journal, Part I.

2. *On the origin of the Myth about Kerberos.*—By DR. R. MITRA.

The earliest notice of dogs as warders at the entrance of Hades occurs in the *Saṁhitá* of the *Rig Veda*. Yama, the regent of that region, it is said, had two canine attendants, each having four eyes, and these brought the dead from the earth to the nether regions. The passages in which they are mentioned are short and sometimes obscure, but their purport is clear enough. The most important of those passages runs thus "(O Agni) hasten on by an auspicious path, avoiding the two four-eyed brindled dogs, the offspring of Saramá. Then approach the bountiful Pitṛis who dwell in festivity and with Yama. (To Yama) place the spirit under the care of thy two four-eyed dogs which guard the roads and thy mansion, and whom men avoid, and keep it in ease and free from disease. The two brown messengers of Yama, broad of nostrils, delighting in other's life, and of great power, wander about among men. May they give us again the auspicious breath of life, that we may again behold the sun." (*R. V. XV, 10—12*). These are quoted in the *Yajur Veda*, and their counterparts occur in the *Atharva Veda*. The later literature of the Hindus casually, but very obscurely, refers to them. Thus in the *Mahábhárata*, Yudhisṭhira in his way to heaven is said to have been led by a dog. These dogs are either called *Svānau* "two dogs," or *Sárameyau*, "the two sons of Saramá," the Dawn.

In Greek mythology the story of the dogs occurs repeatedly, and is well known to classic scholars; but for purposes of comparison it is necessary that a few of its salient points should be noticed here. The oldest notice of a dog as the warder of Hades is to be found in the *Iliad* of Homer where Héraklés refers to his "Haling out hateful Pluto's dog from darksome Erebos."

ἐξ Ἑρέβους ἄξοντα κύνα στυγερῶν Ἀΐδαο. (θ 368).

In the *Odyssey* (XI, 626) the subject is referred to when Héraklés tells Odysseus that his sufferings are but a reflection of the toils which Héraklés himself had undergone.

“Of all which one was, to descend this strand
And hale the dog from thence. He could not think
An act that danger could make deeper sink,
And yet this depth I drew, and fetch’d as high,
As this was low, the dog.”

(*Chapman's translation.*)

In neither place the name of the dog is given; but Hesiod (III, 11) calls him Kerberos, and assigns him fifty heads. Apollodoros, Euripides and Virgil reduce the number of heads to three; while some poets prefer to call the animal “many-headed” or “hundred-headed” (Horat. *Arm.* II, 13, 34. Tzetz. *Lycoph.* VI, 78. Seinec. *Herc. fur.* 784). Apollodoros says that the tail of this animal was formed by a serpent, and the mane by a number of snakes of various kinds. It was begotten by Typhon and Echidna. Hesiod describes another dog of the same parentage, and assigns him to Geryones (293). Thus the Greeks had two dogs, the counterparts of the Vedic Sárameyau. Orthros was the shepherd dog which Héraklés destroyed, and was frightful enough to be reckoned a monster whose destruction would reflect credit on the great hero: the feat represents his eighth labour. This dog is the counterpart of the Vritra of the Vedic legend. He did not, however, attain to any distinction, and was soon forgotten. Kerberos, on the other hand, played a prominent part in Hellenic mythology. As the three-headed monster watching the gate of Hades, it was very much dreaded, and as a dog, like every other dog, was detested by the Greeks.

The belief was that he did no harm to those who entered the mansion of Pluto, but tore up those who attempted to escape from it. This is, however, not in keeping with the legend which says that he growled fiercely when Orpheus was entering the portals of Hades, and had to be lulled by the enchanting music of that gifted harper. One of the greatest feats of Héraklés was the dragging out of the monster from his nook, and this could not be effected without the assistance of such divine personages as Athéné and Hermés.

The three heads of the animal were not peculiarly its own, for Hermés had the same number of heads, whence his name ‘Trikephalos,’ and so had Hekaté ‘triformis.’ According to Bryant the meaning of Kerberos is “darkness” (ἐρεβος)—the darkness of Hades or of night, the Sanskrit equivalent being *Sarvara* or *Sambara*, night slain by Indra.

In Norse legends—as in Baldur's Dream in the elder Edda—the animal is described as “spotted with blood on his front and chest.”

In the Vendidad it finds a prominent place; nor was it unknown among some of the Turanian and Semitic nations.

The belief in it turns up, curiously enough, among Algonquin tribes of the North American Indians, who say that at the further approach of the snake bridge across the river of the dead there is a warder in the form of a great dog.*

Local colouring and minor details apart, the myth is the same everywhere, and its wide dispersion bespeaks its extreme antiquity.

But what it means has not yet been satisfactorily settled. According to some Kerberos is a symbol of all-devouring time, and the three mouths of the animal represent the present, the past, and the future. Milton accepted it in the sense of man's conscience, which preyed within him for his past misdeeds. Others believed it to be the symbol of earth, or of the human passions, the victory of Héraklés denoting the conquest which he achieved over his passions. Bryant takes Kerberos to be the name of a place—and it signified the temple of the sun, deriving it from *Kir-abor* “the place of light.” The temple was also called *Tor-caph-el*, which, it is alleged, changed to Trikephalos.

The latest theory is that it is an offshoot of the far-reaching solar myth which peopled the eastern and the western heavens with such an endless variety of gods and goddesses. According to this theory, the gloom of the morning and the evening represents the two dogs. (Max Müller, ‘Science of Language,’ Second Series, p. 478.) The learning, ingenuity and tact with which this theory has been worked out leaves little to be desired. Philological evidence on the subject is overwhelming, and the coincidences are most remarkable. And yet the enquiry does not seem to be complete. The myth of Kerberos may be due to Saramá = Echidna, the prolific mother of so many romantic stories; but the question remains why was the story elaborated? and what gave occasion to its repulsive character? The Dawn is justly associated with every thing that is charming and full of life; why should it be brought into contact with death and destruction? Divested of its mythological surroundings, the substance of the story is made up of the presence of dogs at the time of transition from life to eternity; this is ill explained by the melting of the gloom of night by the appearance of Dawn. The dog is made the son of Dawn, or darkness proceeding from light, and not light proceeding from darkness. Solar influence moreover always typifies exuberant vivification, and not death. It is by itself quite inexplicable why the glorious and resplendent Dawn should bring forth two ugly puppies. If we take man's life to be the counterpart of the life of the

* Tanner's Narrative, p. 290; Schoolcraft, Indian Tribes, III, 232.

sun, in dawning beauty, in midday glory, in evening death, and the myth of the sunset to represent the close of life, the dogs could scarcely be called the sons of Dawn, for they would come with the gloaming, and not with the rising sun. It may be said that the word *U'shâ* = Dawn is used for all the three stages of the sun's course, and the succession of the night to the resplendence of the setting sun is what is meant by the affiliation; but neither *Saramâ*, nor *Hermés*, nor *Echidna*, is associated with the gloaming. I am disposed to think, therefore, that the solar theory is not by itself sufficient to solve the question. There was something else—something gross and material—in the life of the ancient Aryans which gave rise to the story, and which was subsequently associated with the current solar mythology. And this something I fancy was connected with the funeral rites of the time.

In the most primitive state of human society the simplest and most convenient mode of disposing of the dead was to fling it into the nearest jungle or wild place, either to rot there, or to be eaten up by wild animals. Carrion birds, jackals, foxes and dogs were the animals which were attracted by such castings, and dogs, which had been domesticated at a very early age, were necessarily associated with the disposal of the dead. In this plan of funeral the element of chance predominated, for it was quite uncertain when the destruction would be completed by stray animals. To obviate this uncertainty, the most primitive form of funeral was, it would seem, at one time so far modified as to facilitate the consumption of the dead in a short time by enticing wild dogs, or employing domestic dogs, for the purpose. Such an expedient would not be by any means extraordinary. In the present day the *Pûrsis* carry vultures to such places where there are none, in order that they may be ready at hand to consume the dead in their Towers of Silence. Such enticement or employment of dogs often repeated would consolidate into a tribal or national custom, and the cutting up of the corpse to facilitate rapid consumption would be an innovation that would be easily introduced.

That such a horrible form of funeral did obtain, and still obtains, in some places is unquestionable. According to Herodotus (Lib. I) "the body of a male Persian is never buried until it has been torn either by a dog or a bird of prey. That the Magi have this custom is beyond a doubt, for they practice it without any concealment". (Rawlinson's Herodotus I, 140 §). We have the authority of Strabo (Lib. XV) to show that the practice of exposing corpses to be devoured by dogs was current among the Sogdians and the Bactrians, who on this account named their dogs "buriers." Cicero noticed the same among the Hyrcanians. He says—"In Hyrcania plebs publicos alit canes; optimates, domesticos. Nobile autem genus canum illud scimus esse. Sed pro sua quisque facultate

parat, a cuius lanietur: eamque optimam illi esse censent sepulturam." (Quart. Tuscul. Lib. I, 45.) The same custom also obtained among the Parthians, and Justin says "Sepultura vulgò aut avium aut canum laniatus est." (Lib. XLI, cap. 3.) Prejvalsky has seen it among the Northern Mongolians, where "the dead bodies, instead of being interred, are flung to the dogs and birds of prey. An awful impression is produced on the mind by such a place as this, littered with heaps of bones, through which packs of dogs prowl like ghosts to seek their daily repast of human flesh." (Mongolia. translated by E. D. Morgan, I, p. 14.) Horace della Penna, a Capuchin friar, found at Lhasa, in 1719, the practice of cutting up corpses to be given to dogs to be very common; and Abbé Hue found it among the Tibetans only a few years ago. At the last named place Hue noticed four different forms of sepulture, of which he says, "la quatrième, qui est la plus flatteuse de toutes, consiste à couper les cadavres par morceau et à les faire manger aux chiens. Cette dernière méthode est la plus courue". A reminiscence of this practice is still extant among the Pársis. Their funeral ritual requires that when a corpse is brought to the Dakhmá, or the place where it is to be given up to vultures, it should be first exhibited to one or more dogs, which, I noticed at Bombay, are kept there for the purpose. This ceremonial is called *Sagdíd*, and is strictly observed as it is enjoined in their scriptures. (Vendidad, Farg. VII, v. 3.) That this is a relic of the former detestable custom noticed by Herodotus is evident from the fact of the said scriptures enjoining the exposure of corpses on tops of hills that dogs and carrion birds may see and devour them (Vendidad Farg. VII, vv. 73, 74).

And since this detestable practice exists now, and did exist three thousand years ago and earlier, there is nothing very presumptuous in the supposition that it existed among the Aryans in their common home in central Asia, before their dispersion to Europe and India, between four and five thousand years ago. From these Aryans the Pársis have derived their custom of giving up their dead to be devoured by vultures, and exhibiting them to dogs, and from them has come the myth of dogs at the portal of death.

If on the strength of these arguments it could be assumed that the custom of consigning corpses to dogs did at one time prevail among the Aryans, the details of the myth could be easily and very consistently explained. The idea of Eurytheus sending Héraklés to destroy a dog that did not exist on earth, and consequently did no harm to any body is a very fanciful, not to say an unmeaning one. But if the above theory be accepted, it would follow that the story is a mythical representation of Héraklés having been the first to set about putting a stop to the barbarous practice of casting the dead to dogs, though the attempt did not prove

ultimately successful, for, according to the fable, Héraklés restored the dog to its place at the infernal gate. Not that Héraklés was an entity, for even Herodotus rejected some of his exploits on physical grounds, but the mythical embodiment of the good actions of man. Similarly the Orpheus myth would suggest the idea of the repugnance which men must have felt in allowing their loved ones (symbolised in the story in the person of Eurydiké) to be eaten up by such hateful animals, and of an attempt—an unsuccessful one again—to put down that custom. It might be that the myth of Orpheus belongs to the same class with that of Bacchus recovering his mother Semelé from Hades, and of Ulysses, Odin and others visiting Hades, in which the original idea is of Hades being accessible to mortals under certain circumstances. The three or more heads of Kerberos may be accepted as implying plurality, or many-sided watchfulness, or both; and the quadruple eyes of the Vedic legend typify the same idea. The serpent's tail and the snaky mane of the dog would be the instruments with which corpses were cut up into small morsels. The association of Kerberos with the Dawn by making him the son of Dawn = Saramá = Echidna implies that the removal of the dead in primitive times was generally effected at early morn. It was so among the Greeks; it is still the case with the Parsis and Tibetans. Ancient Hindus absolutely prohibited cremation at night, and in a verse of Yama, quoted in the Nirṇayasindhu, it is said, "Let not cremation, the first śráddha and travelling be performed at night or at dusk, for if done they would be fruitless."* This is not now strictly followed, and to provide for it, a later authority, the Skanda Purāṇa, ordains that "should the cremation be commenced at night it should not be completed until day dawns, so that the offering of water and other rituals may be accomplished in daylight".† The idea was carried further by declaring death at night to be unwelcome. Thus in the Bhagavadgītā, "Should a person die in gloom, at night, during wane, or in course of the six months of the southern declension of the sun, he would go to the region of the moon, and then return to the earth, (but never attain salvation)".‡ Manu indirectly explains the

* सन्ध्यायां वा तथा रात्रौ दाहः पाथेयकर्म च ।

नवदाहश्च नो कुर्यात् क्षतं निष्कलतां व्रजेत् ॥

यमवचनं ।

† यदि रात्रौ दहेत् तस्य समाग्निर्दहनस्य तु ।

परश्चन्द्रदिने सूर्ये कार्यो तस्योदकक्रिया ॥

छान्दवचनं ।

‡ धूमे रात्रिस्तथा छप्नः यस्मात्सा दक्षिणायनं ।

तत्र चान्द्रमसं ज्योतिर्योगी प्राप्य निवव्रते ॥

गीतावचनं ।

object of the prohibition by saying that night is the time for sleep and day for work, and since the wane represents the night of the Pitris, and the southern course of the sun the night of the Devas, offerings at those times are not received by them. Most Smritikāras have quoted these verses as authorities.

With these elements at hand the construction of the myth would be perfectly intelligible, and the course of its development would be easily accounted for. That such was really the case it would be impossible in the present state of our information to assert with absolute certainty; but that the theory affords a natural and consistent solution of a very puzzling question, I am disposed to fancy, will be generally admitted. Were it otherwise, still there would be little to undo the explanation here attempted. It is not necessary to look for entire and absolute consistency in all the details of the story. Neither Hindu nor Greek Mythology was a system designed to be consistent in all its parts. The fables took their rise from various causes, under different circumstances, to elaborate particular facts or ideas, impressive sights or vivid impressions, play on words or poetical thoughts, and gradually they came to be digested, very crudely at best, as a system. Or, as Max Müller very aptly says, "there were myths before there was Mythology, and it is in this, their original and unsystematic prevalence, that we may hope to discover the genuine and primitive meaning of every myth". ("Chips" II, p. 147.) The question is, did the first germ of the story proceed from a very obtrusive fact, a funeral, which was afterwards worked out into a story, or a mere poetical idea, from the first start? and all I contend for is, that the former branch of the alternative appears more likely to be true than the latter.

Mr. Westland remarked on the fanciful nature of the two derivations given by the learned doctor, one of which would make Kerberos mean "The darkness of Erebus" and the other "the temple of Light". He objected to Hercules, himself a solar myth, being clothed with flesh and made to appear as an actual reformer of funeral customs. He also pointed out that whether the solar-myth theory was right or wrong, nothing in the learned doctor's paper came in proof or in disproof of it; inasmuch as that paper was devoted to shewing the origin of the idea of the dog himself, whereas the Solar-myth theory only pretended to shew how the dog, having been originated, was clothed with certain attributes.

Dr. Mitra explained that the derivations were not his own, but obtained from leading authors, and that the mythical character of Hercules did not in any way affect the question at issue. The attempt was to resolve one or more myths into their primary elements and not to preserve their entity.

3. *An account of the excavation of a mound called Jowhri Di, near the village of Imadpur, in the Muzafferpore District.—*

By J. E. LINCKE, C. E.

(Abstract.)

The mound is some 100 feet square and some 10 feet high with a few very ancient peepul trees growing on it. A drift which was run from the east at the level of the natural ground into the mound brought to light a wall, 4 feet deep and 4 feet broad, and beyond it a flooring of bricks on a thin layer of sand. Similar drifts were made from other sides, with a similar result. Thus the three sides of a square fort were laid bare, with a sort of solid bastion at the south-west corner and a porch in the centre of the east wall. On the fourth side of the fort, no remains of a wall were discovered. Part of the brick flooring in the middle of the fort was removed and a well dug 4 feet deep, disclosing evidences in the shape of broken brick and pottery of the mound having been artificially made. Of the superstructure nothing certain is known. There is said to have been once a tower, three stories high. Tradition says that there was a fort and town of the Cherú Rája at this spot, long anterior to the Muhammadan conquest, and that the last Cherú Rája having been defeated in battle destroyed himself and his family and treasure with the castle which was burnt. Specimens of the antiquities found during the excavations were sent with the paper and exhibited to the meeting. They consisted of highly glazed pieces of broken pottery, remains of clay-toys or votive figures, clay spindle whorls (such as noticed by Mr. Rivett-Carnac, in the *Journal* of 1880), pieces of bone, etc. The last were identified as those of a turtle. Two brass figures of Vishnu and Ganesa were also sent to be exhibited. They had been obtained by Mr. Lincke from a villager, who said he had dug them up in a field near the mound. The figures bear, at the foot, short inscriptions, the form of the letters of which shows that they are comparatively modern. The inscription on the figure of Krishna reads हरिनिवे० दे० धर्म० abbreviated for हरिनिवेदन देय धर्म i. e., "a religious gift dedicated to Hari". That on the figure of Ganesa is too badly cut to be clearly read, but the first word appears to be *Kanha* the name of the donor; the last two are *deya dharmma* "a religious gift".

Specimens of the antiquities found in or near the mound were exhibited at the meeting.

This paper will be published in the *Journal*, Part I.

LIBRARY.

The following additions have been made to the Library since the meeting held in April last.

TRANSACTIONS, PROCEEDINGS AND JOURNALS,

presented by the respective Societies and Editors.

- Berlin. K. preussische Akademie der Wissenschaften,—Monatsbericht, November 1880.
- Bombay. The Indian Antiquary,—Vol. X, Part 118, April 1881.
- . Bombay Branch of the Royal Asiatic Society,—Journal, Vol. XIV, No. 38.
- Bordeaux. Société de Géographie Commerciale,—Bulletin, No. 6, 1881.
- Calcutta. Registers of Original Meteorological Observations for January, February and March 1881.
- Dresden. Sitzungs-Berichte der Naturwissenschaftlichen Gesellschaft Isis, January to December 1880.
- Dublin. Royal Geological Society of Ireland,—Journal, Vol. V, Part 3.
- Haughton, Rev. S.*—Notes on the Annual Water-discharge of Large Rivers, with Indications of some new Methods of Calculation. *Ball, V.*—On Spheroidal Jointing in Metamorphic Rocks in India and elsewhere, producing a Structure resembling Glacial "Roches Moutonnées". *Haughton, Rev. S.*—On Rossetti's Law of Cooling, applied to the consideration of the relative effects of Sun-heat, Earth-heat, Star-heat, and Atmospheric Conditions, upon Climates during Geological Time. *Ball, V.*—On the Evidence in favour of the belief in the existence of Floating Ice in India, during the deposition of the Talchir (Permian or Permian-Triassic) Rocks. *Ball, V.*—On the Coal Fields and Coal Production of India. *Ball, V.*—On the mode of occurrence and Distribution of Gold in India.
- London. Society of Telegraph Engineers,—Journal, Vol. IX, No. 34.
- . Geological Society,—Quarterly Journal, Vol. XXXVII, Part 1.
- Carrall, J. W.*—On the Locality of some Fossils found in the Carboniferous Rocks at T'ang Shan, China.
- . Royal Society,—Proceedings, Vol. XXXI, Nos. 207 to 209.
- . Royal Astronomical Society,—Monthly Notices, Vol. XLI, No. 4.
- . Royal Geographical Society,—Proceedings, Vol. III, No. 3.
- . The Academy,—Nos. 463—466.
- . The Athenaeum,—Nos. 2786-2789.
- . Nature,—Vol. XXIII, Nos. 582, 594, 596—597.
- Rome. Società degli Spettroscopisti Italiani,—Memorie, Vol. IX No. 12, December 1880; Index to Vol. IX, 1880; and Vol. X, No. 1, January 1881.
- Shanghai. North-China Branch of the Royal Asiatic Society, Journal, Nos. 13 and 14.

St. Petersburg. L'Académie Impériale des Sciences,—Bulletin, Vol. XXVI, No. 3.

Dorn, B.—Sur les monnaies des Ileks ou anciens Khans de Turkestan.

———. *Mémoires*,—Vol. XXVII, Nos. 13—14.

Dansky, J. and *Kostenitsch, J.*—Ueber die Entwicklungsgeschichte der Keimblätter und des wolf'schen Ganges in Hühnerrei.

———. Russian Geographical Society,—Proceedings, Vol. XVI, 1880, and Vol. XVII, 1881.

———. *Acta Horti Petropolitani*,—Vol. VII, Part 1.

Sydney. Royal Society of New South Wales,—Journal and Proceedings, Vol. XIII, 1879.

Trieste. Società Adriatica di Scienze naturali Bollettino,—Vol. VI, No 1.

Yokohama. Asiatic Society of Japan,—Transactions, Vol. IX, Part 1.

BOOKS AND PAMPHLETS,

presented by the Authors and Editors.

TIESSENHAUSEN, Prof. W. de. Notice sur une collection de monnaies Orientales de M. le Comte S. Stroganoff. 4to., St. Petersburg, 1880.

WYMAN, F. The Tea Cyclopædia, a volume of Selections from leading and original articles, correspondence and papers collated from the last eight volumes of the Indian Tea Gazette and from several other valuable sources. Roy. 8vo., Calcutta, 1881.

MISCELLANEOUS PRESENTATIONS.

Bericht über die Feier des 50 Jahrigen Doctor-Jubilæums des Prof. Dr. Hermann Burmeister begangen der 19 December 1879 in Buenos Aires Als Manuscript gedruckt. 8vo., Buenos Aires, 1880.

BURMEISTER, DR. H. Description Physique de la République Argentine. Vol. III, Part 1. 8vo., Buenos Aires, 1880.

———. Atlas, Part 2, Lepidoptères, Fol., Buenos Aires, 1880.

MUSEO PUBLICO DE BUENOS AIRES:

Eleventh Annual Report of the U. S. Geological and Geographical Survey of the Territories embracing Idaho and Wyoming, being a Report of Progress of the exploration for the year 1877. By F. V. Hayden. 8vo. Washington, 1879.

DEPARTMENT OF THE INTERIOR, U. S. AMERICA.

FALLON's new English-Hindustani Dictionary, Part II, March 1881.

The Indian Antiquary, Vol. X, No. 118, April 1881.

Selections from the Records of the Government of India, Home, Revenue and Agricultural Department, No. 174. Reports on publications issued and registered in the several Provinces of British India, during the year 1879. 8vo., Calcutta, 1881.

HOME, REVENUE AND AGRICULTURAL DEPARTMENT.

FREDERICI, K. *Bibliotheca Orientalis* for 1877. Dem. 4to., London.

DR. A. F. R. HOERNLE.

MACHADO, J. J. *Moçambique*, 8vo., Lisboa, 1881.

MALHEIRO, L. *Explorações Geologicas e Mineiras nas colonias Portuguezas*. 8vo., Lisboa, 1881.

GEOGRAPHICAL SOCIETY OF LISBON.

Records of the Geological Survey of India, Vol. XIV, Part 1, 1881.

BENGAL GOVERNMENT.

Report on the Judicial Administration (Criminal) of the Central Provinces for the year 1880, Fcp., Nagpur, 1881.

CHIEF COMMISSIONER, CENTRAL PROVINCES.

Report on the Administration of the Madras Presidency, during the year 1879-80, 8vo., Madras, 1880.

MADRAS GOVERNMENT.

Reports of the Council of Education upon the condition of the Public Schools, and of the certified Denominational Schools for the year 1879, 8vo., Sydney, 1880.

Annual Report of the Department of Mines, New South Wales, for the year 1878-79, 4to., Sydney, 1879-80. With a map.

ROYAL SOCIETY OF NEW SOUTH WALES.

SCHUBART, TH. Description et notices sur l'installation et l'entretien des Météorographes graveurs de von Rysselberghe et Schubart, construits pour compte du Ministère des Indes Britanniques. 8vo., Gand, 1880.

METEOR. REPORTER, GOVT. OF INDIA.

PERIODICALS PURCHASED.

Calcutta. The Indian Medical Gazette,—Vol. XVI, No. 4, April 1881.

———. The Calcutta Review,—Vol. LXXII, No. 144, April 1881.

Göttingen. *Gelehrte Anzeigen*,—Nos. 12—16, 1881.

———. *Nachrichten*,—Nos. 6-7, 1881.

Leipzig. *Annalen der Physik und Chemie*,—Vol. XII, Part 3.

———. ———. *Beiblätter*,—Vol. V, Part 3.

London. The Nineteenth Century,—Vol. IX, No. 49, March 1881.

———. Journal of Botany,—Vol. X, No. 219, March 1881.

Jackson, B. D.—On some recent tendencies in Botanical Nomenclature. *Campanula rotundifolia*, L., in Japan.

———. Journal of Science,—Vol. III, No. 87, March 1881.

———. Messenger of Mathematics,—Vol. X, No. 10, February 1881.

———. The Entomologist,—Vol. XIV, No. 214, March 1881.

Goock, W. D.—Butterfly hunting in Natal, on the Coast-Lands.

———. The Entomologist's Monthly Magazine,—Vol. XVII, No. 202, March 1881.

London. *Annals and Magazine of Natural History*,—Vol. VII, No. 39, March 1881.

Wallich, Surgeon-Major.—On Siliceous Sponge-Growth in the Cretaceous Ocean.

———. London, Edinburgh and Dublin *Philosophical Magazine*,—Vol. XI, No. 67, March 1881.

———. *The Publishers' Circular*,—Vol. XLIV, Nos. 1044—1045.

———. *Society of Arts*,—*Journal*, Vol. XXIX, Nos. 1478—1481.

———. *The Chemical News*,—Vol. XLIII, Nos. 1112—1115.

———. *Journal of Conchology*,—Vol. III, No. 4, October 1880.

———. *Report of the British Association for the Advancement of Science*, 1880.

New Haven. *American Journal of Science*,—Vol. XXI, Nos. 121—122, January and February 1881.

Paris. *Comptes Rendus*,—Vol. XCII, Nos. 10—13, 1881.

———. *Journal des Savants*, March 1881.

———. *Revue Scientifique*,—Vol. XXVII, Nos. 12—15.

———. *Revue Critique*,—Index to Vol. X, and Vol. XI, Nos. 8, 11—14, 1881.

———. *Revue des deux Mondes*,—Vol. XLIV, Parts 2 and 3.

———. *Annales de Chimie et de Physique*,—Vol. XXII, March 1881.

BOOKS PURCHASED.

GILL, CAPT. W. *The River of Golden Sand; the Narrative of a Journey through China and Eastern Thibet to Burmah.* With an Introductory Essay by Col. H. Yule. 2 Vols. 8vo., London, 1880.

REDHOUSE, J. W. *The Mesnevi* (usually known as the *Mesneviyi Sherif*, or *Holy Mesnevi*) of Mevlana (our Lord) Jelalu'd-din, Muhammed, Er-Rumi. Book the First. Together with some account of the Life and Acts of the author, of his ancestors, and of his descendants; illustrated by a selection of characteristic anecdotes, as collected by their historian, Mevlana Shemsu'd-din Ahmed, El Effaki, El 'Arifi. Translated and the Poetry versified. 4to., London, 1881.

ROSENTHAL, DR. J. *General Physiology of Muscles and Nerves* (Second Edition). Dem. 8vo., London, 1881.

STEWART, A. and LONG, G. *Plutarch's Lives*, translated from the Greek. Vol. II. 8vo., London, 1881.

PROCEEDINGS
OF THE
ASIATIC SOCIETY OF BENGAL.
FOR JUNE, 1884.

The Monthly General Meeting of the Asiatic Society of Bengal was held on Wednesday, the 1st June, at 9-15 P. M.

The Hon'ble H. J. REYNOLDS, C. S., Vice-President, in the Chair.

The minutes of the last Meeting were read and confirmed.

The following presentations were announced—

1. From the Marine Survey Department,—Chart of Bankot and entrance to Mhar or Savitri River.

2. From the Bengal Government,—(1), Report on the Amaravati Tope and excavations on its site in 1877, by R. Sewell; (2), Selections from the Records of the Government of India, Home, Revenue and Agricultural Department, No. 174.

3. From the Authors,—(1), Kaiser Akbar, Part II, by Graf. F. A. Noer; (2), Report on the Census of Calcutta taken on the 6th April 1876, by H. Beverley; (3), The Indo-Aryans, their History, Creed and Practice, by Ramachandra Ghosha.

4. From the Magistrate of Fatehpur,—A piece of Shah Alam's reign.

The following Gentleman is a candidate for ballot at the next meeting—

Prince Firukh Shah, proposed by Moulvie Kabiruddin Ahmad, seconded by J. Eliot, Esq.

The SECRETARY reported that Mr. C. E. Buckland had intimated his desire to withdraw from the Society.

The COUNCIL reported that during Dr. M'Cann's absence for a month from Calcutta, Mr. J. Eliot had been asked to officiate as Honorary Secretary.

Mr. C. H. TAWNEY exhibited a rare coin of Sophytes and said—

“While looking through a bag of coins, brought me by Dr. Hoernle, who is engaged in arranging the Society’s collection, I found a coin of Sophytes, precisely resembling that described by General Cunningham in the Vth volume of the Numismatic Journal, p. 220 and ff. General Cunningham says the coin is extremely rare. Von Saket in his *Nachfolga Alexander’s des grossen*, p. 87, marks it as RRRR. The coin seems to me to be genuine, and I have therefore thought it advisable to exhibit it to the members of the Society. I should propose that it be sent to General Cunningham for his opinion.”

The following papers were read—

1. *On the Voles (Arvicola) of the Himalayas, Tibet and Afghanistan.*—

By W. T. BLANFORD, F. R. S., &c., with two plates.

(Abstract.)

In this paper the author gives an account of all the Himalayan, Tibetan and Afghan Voles (9) which have hitherto been described, and for this purpose the author has examined all the type specimens.

The molar teeth of the available forms are figured and described in this paper.

Mr. Blanford considers it very doubtful that any Vole has ever been found in the Oriental region.

This paper will be printed in the current volume of the Journal, Part II, No. 2.

2. *On Myospalax fuscicapillus, Blyth.*—By W. T. BLANFORD, F. R. S., &c.

(Abstract.)

This is a description of a small rodent which was named by Mr. Blyth 40 years ago. The original specimen was obtained at Quetta and another from Afghanistan having been recently found among the collections of the East India Company which have been transferred to the British Museum, Mr. Blanford has compared them and gives a very full description of the species and its affinities.

This paper will also appear in the Journal, Part II, No. 2.

3. *Notes on the Inhabitants of the Nicobars.*—By F. A. DE ROEPSTORFF.

In the Proceedings of the Asiatic Society of Bengal for July 1876 and for January 1881 will be found two papers in which I called attention to the inland tribe of the Nicobars. Since my paper was printed in January, a very interesting expedition was made by Colonel T. Cadell, V. C., Chief Commissioner of these islands, and myself, interesting to us and I hope also to the members of the Society. After my success in visiting an

uninhabited village and in opening communication with a Shombeng in October last, Colonel Cadell visited Galathea bay in December with the special intention of visiting the inland tribe on the Galathea river, which had been proved to be there by the members of the Danish Expedition in 1845. The weather was, however, very boisterous, and the coast people could not be prevailed on to act as guides, and the attempt had to be given up.

In March last Colonel Cadell went on another inspecting expedition to the Nicobars, and I was attached to it. After visiting Little Brother, Andamans, Car Nicobar, we anchored at Nancowry and provided ourselves with a guide from there. Next day we visited Pulo Condul, and I prevailed on one of the principal men there to come with us: here we bought a canoe. On the evening of the 15th March, we anchored near the village Laful and at once made arrangements with the natives that they should next day conduct us inland, but this time right up into the country of the Shombengs. During the night we had some heavy showers, and when we started in the early morning it was with doubt as to whether we would be troubled with rain. The rain did not fall and the clouds made our ascent cool and nice. As there was a little surf, we had to land in a canoe that the guides had brought on board the evening before. The Coast-people are as a rule not quick in their movements, but this morning they were very punctual, and within ten minutes after landing we had the luggage deposited on a canoe and we with our two men and five Laful guides were carrying the canoe over the bar at the entrance to the creek. The ascent we made was over the same ground that I had gone over in October and mentioned in my paper of January. The only difference was that we had then ascended the stream in a pouring rain, the stream was swollen, the boulders slippery, I was then panting with fever, and we were neither provided with food nor with clothes. Now the stream was dry, the sky clouded, we were well provided with all we needed ourselves, and, although we left too quickly to provide our guides with any thing, we trusted to the gardens of the Shombengs to supply them.

We passed up the creek, landed, saw the village of the Coast-people, went through the same deserted village of the Shombengs that I visited in October, struck the dry stream and ascended it as on my former visit. Near the spot where we then halted, we came across a little new clearing of the Shombengs which was not there in October. There was only one hut, and here we saw for the first time the very curious cooking arrangement of the Shombengs, which the Galathea Expedition in 1845 came across and describes as follows: "Such a sheet of bark also formed the substance of their cooking-pot, which stood on a stand formed of four little sticks with cross-sticks, under which the fire was laid." Under the little hut in this place there was a bark-pot. It was formed of one sheet of bark bent together.

The open seams were closed by two little sticks on each side which were tied together and had a crosstree to hold them in position. The seams were tightened with clay and the bottom was steadied with ribs like those of a boat. This pot had been exposed to fire. After resting a little here we went on and came at last to the point where we should leave the main stream. Our party was by this time smaller, as two of our Laful guides had gone on ahead to warn the Bengs of our approach. Where a steep hill-waterfall (now dry) opened into the stream-bed, the men deposited the luggage, saying that they would leave it here for the Shombengs to carry up as the hills were too steep.

This boded well, for it showed that they expected the Shombengs would be friendly, that we were not very far off, and also that they put confidence in the people we were going to. We then went up the side-branch and ascended what in the rains must be an inaccessible fortress. The path we found some 1000' up the nullah and it led us up nearly perpendicularly. Along the path were creeping bamboos that were very trying. The road was very steep and straight, and the distance was not proportionate to the fatigue in ascending. At the top of the hill we came on an enclosed village of three houses lying just on the outskirts of an extensive clearing that had been made quite lately, for many of the trees were not yet dry.

The distance we had gone over was computed as follows:

In canoes up the creek about	1½ mile.
Up the stream to first Beng village	1 "
Up the stream to second "	1 "
To where the luggage was deposited	½ "
Up the steep hills	1½ "

The total was thus 5½ miles in a west, slightly south, direction.

Height ascended above the sea:

Ascending the stream more than	300'
By the hill ascent about	1200'

Total probable ascent ... 1500'

The village was enclosed by a stockade consisting of split logs, a horizontal piece alternately with one where the logs were in a vertical position. There was no entrance to this enclosure and it had to be climbed: it was about 3' high. The space inside was well cleared and was planted with plantain shoots each surrounded by little protecting sticks. Inside this rail were three huts of the same construction as those described by the "Galathea" Expedition and as those we had seen on our way up but rather bigger. These were raised 3' from the ground, 6' × 6'. The posts were very thin bullies: the roof consisted of back-sheets and a few rattan leaves. Only one house of three was provided with a bark cooking-

pot, but in this it was fixed at the southern end and was on the platform, and not on the ground as was the first one I mentioned. The pot consisted of three sheets of bark, one stuck inside and over the others like roofing: it had been exposed to fire.

We had to climb over some fallen trees, and when we came up to the village we found inside "Koal" the man I had met in October, and an old man suffering from hydrocele. "Koal" recognized me and promised to bring our luggage, and in a little while we were with our guides in sole possession of a Shombeng village. The inhabitants had evidently left on our approach, but they had had time to take away all their valuables, for they only offered us shelter, which, however, was an important point.

Colonel Cadell took possession of one house and I of another. The difference in size was not very great, but it was quite balanced by the cooking pot at the one end that shortened it considerably, so that only two small persons could find shelter in it. After a while our luggage was brought up. Koal and the old hydrocele, however, disappeared again after having brought our guides a few Gunyas. After a while we were informed that the Shombengs were afraid of us and would not come in, so we had to put pressure on. Our guides had no food, and when we declared that we would not leave till we had made friends with the inland tribe they began to bestir themselves. They went off after Koal and after a long explanation he at last promised to bring in some of his friends, saying that they would be with us at 2 P. M., pointing to the sun. We waited patiently till 2 and impatiently after that time, and when it was nearly dark we were beginning to fear that our visit had been all in vain, even our guides were in a bad humour, when we were cheered up by the arrival of a party of this curious people, headed by Koal. We remained seated where we were and took no notice of them till they had come inside the enclosure and stood round us. We then gave them peace-offerings of strings of little glass beads, and in a very short time we were on the best of terms. They submitted to our examining them and to our taking locks of their hair. These little glass beads are the only valuable property they care for and ours were considered very nice. Money they did not even know. Seated near a smoking fire that nearly blinded us, and delighted at our success, we proceeded to examine them, and, to make sure of the accuracy of our notes, they were drawn up by Colonel Cadell on the spot and contain what we agreed about. I give our notes verbatim. The first man mentioned I will refer to later on.

"Koal, Mr. de R's old friend with the bushy hair has already been described.

"No. 1, Alles—height 5' 3", chest 36", age about 30 or 35—hair thin, straight, black, eyes black—well built, but rather bony—parts

loosely tied, as if not often covered at all—pubes sparse—toes spread out—small sparse moustache—a few hairs in beard—teeth discolored but not enlarged—head appears as if flattened behind but this is said not to be customary with Shombengs—color slightly, very slightly, lighter than that of the Coast-people—ears bored, and pith, $\frac{1}{2}$ " diam., through one of them. Double string of white seeds from over left shoulder and below right arm—on both arms strings of dark and light fibre intertwined.

"No. 2, Towkow—height 5' $2\frac{1}{2}$ ", chest 36"—age about 16 or 18—hair straight, plentiful, cut square over eyebrows—black-brown eyes, Mongolian shape—high forehead—face long, narrow—nose straight with slight bend—mouth small—teeth slightly discolored—a pleasant face altogether—parts well developed and scarcely concealed—necklace of white seeds—string on arm as No. 1—right ear bored but not enlarged—left with bamboo and leaves through lobes—small strip of red chintz round head.

"No. 3, Ahéan—son of No. 4—age 16—height 4' $11\frac{1}{2}$ ", chest 35"—hair straight, long, thin, black—eyes well defined, Mongolian type, but not so much as No. 2—prominent cheek-bones—upper lip thin but protruding—a few single hairs on chin—both ears pierced—a round piece of stick pointed (1" diameter) through one lobe and pith through other—parts small and loosely tied—a well made youth.

"No. 4, Taug—age about 40—height 5' 3"—chest 36"—hair straight, thin, tinged with grey—moustache almost invisible and no other hair on face—both ears pierced—through right, pith $\frac{1}{2}$ " diameter, through left, round piece of stick $\frac{3}{4}$ " diam. as No. 3—teeth discolored, but not enlarged—a well built man—parts small, loosely tied—round neck necklace of white and red seed with fringe of pieces of plantain leaf curled—some neatly woven straw in his hand.

"No. 5, Kéal, a priest—age about 30—height 5' $4\frac{1}{2}$ ", chest 36 $\frac{1}{2}$ "—eyes small, brown—hair straight, long, black—slight trace of moustache—ears bored, rolled leaf in one—two front upper teeth $\frac{1}{4}$ " long, but no foreign substance on them—necklace of small beads—band of white bark round head."

The following was added next morning:

"No. 6, an old man with hydrocele } whom we did not describe.
"No. 7, ditto ditto }

"No. 8, Khoál, wife of Koal—about 25—height 5' 1"—chest 31 $\frac{1}{2}$ "—hair straight, coarse, black with brownish tint, parted over eyes, narrow band of white bark round it—both ears pierced, one with a hollow bamboo through it, the other with a stick—teeth discolored but not enlarged—necklace of several rows of small beads—striped red and white cloth round loins, and a loose piece of blue cloth over shoulder or anywhere where

fancy pleased. She brought with her a boy of about 6, a nice intelligent-looking lad, and, afterwards, on her back and hanging to her neck, a small boy of about 2.—T. CADELL."

It will be seen from the above notes that the people is a comparatively big race with straight hair and Mongolian twisted eyes, and in them Col. Cadell agrees with me that every trace of Papuan or Negrito features is quite absent.

There remains, however, Koal the man I met in October. I described him in the paper of Jan. 1881 thus:

"One look at him sufficed to assure me that I had now come across a specimen of a curly-haired race, Papuan or Negrito. His hair was bushy and with rather a bend, and was very abundant. It covered the whole surface of his head and was not, like the hair of an Andaman Negrito, of the Papuan of New Guinea or of the Negro, found in tufts or patches. It had, however, the Papuan quality of being long, longer than the hair of the Andamanese ever is. The hair was, or appeared to be, brownish, interspersed with white, very coarse and stiff, and gave an exaggerated appearance of size to his head....His face was pleasant, especially when smiling, his forehead was high, his eyes were black, his nose well formed and arched, his upper lip was remarkably prominent from the base, his underlip small, his teeth were black but of natural size....His colour was copper-brown and a shade fairer than our Great Nicobar and Camorta guides. His complexion did not at all remind me of the deep shining black of the Andaman Negrito....He had his private parts tied up, but in such a loose way that it was evident that the Coast-people are right when they assert that the male Shom-Bengs go quite naked in their own haunts." This description I still maintain is correct. Colonel Cadell states that he noticed that he was quite different from the others and that, if searching for Papuan or Negrito elements, he would most certainly have made the mistake of taking him to be such, if he had seen him alone.

He is quite a phenomenon, but, I think, a *lusus naturæ*, for we saw his children and neither of them had the slightest curl in their hair nor any feature recalling the Papuan. All the others agreed in appearance. They were all scanty-haired on the face and on the body, and we only saw one man (not described in the list) who had a fairly well developed moustache. They seemed of mixed Malay-Mongolian origin, and they were doubtlessly a different race from the Coast-people, being slightly fairer and with lighter hair and darker eyes than they, but yet the difference is not so great that it would be impossible to meet a Shombeng among the Coast-people and not notice the difference.

They are great cultivators and had cleared big tracts of land but in a very slovenly manner. No attempt had been made to burn the fallen trees

nor any to get rid of the branches. They do, however, cultivate deeply, for I got in 1876 from the Shombeng in Ganges harbour a very big yam and some Gunya which must have been carefully grown. One great clearing Col. Cadell and I went over. It was fenced all round, evidently to keep out pigs. The clearing stretched over a small valley from hill top to hill top. The only road across the confused masses of *débris* lying on the ground was a continual bridge of fallen logs, which seemed well suited to Shombeng feet but less so to boots, and we found it rather difficult to cross. On the top of the other hill we came to two huts. The one was circular and 8½' from the ground. They were very dilapidated and did not look fit to withstand the heavy storms of the S. W. Monsoon. Col. Cadell went alone with Koal down a precipice with just space here and there for a naked Shombeng foot and he saw there another big clearing. To me it appeared as if the Shombengs with these clearings were making preparations for next year's operations, and that they leave any occupied piece of land when the virgin-soil fertility is exhausted. As the only domestic animal they keep is the pig, they have no means of manuring the exhausted soil, and they would therefore have to go to new grounds. The little villages near the stream below the hills seemed to me intended for the rainy season as they were in sheltered places and were newly made. After the meeting with Koal the first time, I thought that my idea that the Shombengs were not a Papuan or Negrito race was erroneous. I therefore made haste to publish a report of my meeting and of my doubts. Now that I have met the Shombengs in greater numbers, I beg to revert to my old theory that they are a race different from the Coast-people, without any Papuan or Negrito blood, and I beg again to suggest that they may be the same race originally as the inhabitants of the little Island of Schowra, who live by cultivation whereas all the islanders around them are keen fishermen. They are *also* supposed to be fairer than the Coast-people and have a Mongolian cast about their eyes.

I would have preferred that the report of our visit to the Shombeng country had come from the pen of Colonel Cadell, who would have given a better description of all we saw and heard, especially as the Expedition was originated and carried through by him, but he has suggested that I should write it.

Mr. BALL said: "The proverbial difficulty of proving a negative is well illustrated by Mr. de Roepstorff's paper, which is a further contribution on the subject of the inland inhabitants of the Great Nicobar. His researches do not disprove the supposed existence of a race in the interior of that Island having Negrito affinities; though it must be confessed that they render it less probable than it was thought to be before.

"A thorough scientific exploration of the islands included in the Andaman and Nicobar groups is a great desideratum, not only for the purpose of setting at rest such Anthropological questions, but also in order to completely elucidate the Zoology and Geology.

"With reference to the latter there are two questions of considerable economic importance which have yet to be determined. The first of these is whether coal in workable quantities exists. Hitherto, such coal as has been found in the Andamans and Nicobars only occurs in small nests of limited extent and not in regular seams. The rocks of the Andamans are, so far as is known, of older Tertiary (Eocene) and perhaps partly Cretaceous ages: they are probably closely allied to some of the groups which include workable coal in upper Burma and Assam. In the Nicobars there are rocks of the same age and together with them some which are younger, probably Miocene. There are believed to be distinct points of resemblance between the former and the coal-bearing rocks of Sumatra, Borneo and Java. So that, arguing from analogy, there appear to be grounds for believing that a useful discovery of coal may be made in these islands.

"Some years ago I appended to a paper on the Geology of Port Blair, which was printed in the *Journal*,* three allusions, two distinct, and one less clear, to a rumour that mercury has been found in the Andamans. The mode of occurrence and the age of the rocks with which mercury occurs in different parts of the world vary a good deal; for present purposes it is only necessary to refer to California where the deposits afford two-thirds of the mercury of commerce. These deposits occur in altered Cretaceous rocks with which serpentine is associated, the ore of mercury, cinnabar, being sometimes found in the serpentine itself. It is believed, as above stated, that some of the rocks in the Andamans will prove to be of Cretaceous age, and it is an ascertained fact that serpentine occurs in some abundance associated with them. Now it is known, all the world over, that similar associations of rocks are often accompanied by the occurrence of similar minerals. It seems therefore to be quite justifiable to express a hope that research may prove the existence of mercury in these islands. It is needless to remark that owing to its high value such a discovery would be of great importance.

"It is now ten years since I directed the attention of some of the officials in the Andamans to the possibility of such a discovery being made and Mr. Homfray, then protector of the Andamanese, shewed them some metallic mercury, but they appeared to be unacquainted with it and nothing was elicited. A much more likely way of being successful would be to make search for cinnabar which is the common ore of mercury.

"The red pigment commonly used by the Andamanese was some years ago analyzed by Dr. Waldie and found to consist of red oxide of iron.

This need not be taken as proving that no source of cinnabar was available to them, because they may have found by experience that the use of the latter was injurious to their health.

"An expedition to explore these islands should be thoroughly well officered and equipped. Speaking from personal experience, I can say that the risk of fever is very great, and those who remain on shore at night will have to take every precaution to avoid its attacks; but, as I have endeavoured to show, there are reasons, both scientific and practical, which encourage the belief that such an exploration would prove fruitful in good results."

4. *Note on a photograph of a Buddhist sculpture found at Bulandshahr.*—By F. S. GROWSE, C. I. E.

The Buddhist sculpture, shown in the accompanying photograph, was discovered a few days ago at Bulandshahr, in the garden of a native gentleman, Munshi Gopál Rái, close to the Id-gah, between the city and the civil station. It had originally been dug up some 20 years previously in the old Khera known as the Moti Bazar, which is now being levelled. It is of interest as being, so far as I know, the only unquestionable proof that has yet come to light of the ancient prevalence of Buddhism in this neighbourhood. The sculptured pillars that I found in the town of Bulandshahr, and of which a notice and illustration were given in the Society's Journal for 1879, may have belonged either to a Buddhist or to a Brahmanical temple; it is impossible to say which, the style of architecture affected by both being essentially the same and differing chiefly in ground plan. The stone, in which the sculpture is cut, is a square block measuring in its mutilated state 1 foot $4\frac{1}{2}$ inches either way, the material being a black slate, not the *sang-músa* or black marble of Jaypur. The principal figure represents the Buddha, enveloped in a thin robe reaching to the wrists and ankles and falling over the body in a succession of narrow folds. His arms are slightly raised in front of his breast and the thumb and fore-finger of his left hand are joined at the tips, while with his right hand he touches its middle finger, as if summing up the points of an argument. On either side of his throne is a rampant hippogriff, with its back to the sage and rearing its head over a devotee seated in an attitude of prayer. The throne is supported on two recumbent lions, flanked by Hindu caryatides with impossibly distorted limbs as usual; and at the base again are other devotees kneeling on either side of the footstool, the front of which is carved with the mystic wheel between two couchant deer. The upper part of the stone has been broken off, carrying with it the head of the principal figure, but what remains is in good preservation and has been well executed. On a ledge in a line with

the feet is an inscription in characters apparently of the 9th or 10th century, of which I sent a rubbing to Dr. Hoernle, who reads it as follows:

Ye dharmmā hetu-prabhavā hetus teshān tathagato hyavadat teshām cha yo nirodha. evam-vādi mahāsramanah.

This would be in English "All things that proceed from a cause, says the Tathāgata, their cause is identical with their destruction; such is the dictum of the great philosopher."* If this is the form of words that is always used, it is curious that a popular symbol of faith should have been framed with so much tautology in so short a compass.

5. *Note on some curiosities found at Bulandshahr.*—By F. S. GROWSE, C. I. E.

In the course of some excavations in the plateau of high ground immediately outside the town of Bulandshahr, mentioned in the previous note under its popular name of the Moti Bazar, I have come upon the remains of an old local manufacture, of which I send six specimens for the inspection of the Society. They may be described as earthenware flasks or vases, but the purpose for which they were intended is by no means obvious, and I should be glad of suggestions. They are all alike in general shape, being pointed at the bottom like a Roman amphora and with a very small orifice for the mouth; but they vary very much in the patterns with which they have been ornamented, and are of different size, weight and thickness. Some have apparently been squeezed out of shape, before the material of which they are made had had time to dry. The spot where they were found is evidently that where they were baked, as the number that have been dug up entire amounts to several scores, besides a multitude of broken pieces, all mixed in a deep deposit of ashes and the other refuse of a potter's kiln.

At the same level have also been uncovered many fragments of wall and pavement, constructed of large and well-burnt bricks measuring as much as 1 ft. 7 in. in length by 11 inches in breadth and 3 in. in thickness. Most of these bricks are marked on one side with two lines drawn by the workman's fingers in the damp clay, and they are, I should say, of great antiquity. At first, however, I did not suppose that the flasks were at all of the same age. The site might have been originally occupied by a fort and then deserted for centuries before the potters came and set up their kilns upon it, making use—for their houses—of any old building materials that they happened to light upon. The traditional name by which the piece of ground is popularly known is, as I have said, the

* [Or rather: "all things that proceed from a cause, their cause as well as their destruction the Tathāgata has declared; such is the dictum of the great philosopher." Ed.]

Moti Bazar, and there is much vague talk of coins and solid bars of silver having been discovered there in former years. It is bounded on one side by a deep ravine, which I am now filling up in order to convert the entire area into a public garden, which will be called the Moti Bâgh, thereby perpetuating the old tradition.

Most natives who have seen the flasks think they were meant to hold either gunpowder or oil, which is what the shape suggests; but the material, on account of its weight, seems unsuitable for such a purpose, if the flask was to be carried about on the person, while the pointed bottom makes it awkward for storing. The idea has also been hazarded that they were meant to be filled with gunpowder and then exploded as a kind of fire-works; but, if this were their object, there would scarcely have been so much trouble spent on their ornamentation. A third theory, which has found much favour on the spot, but which at first I was inclined to reject as altogether untenable, is that they were intended to form a balustrade for a balcony or the roof of a house. Perhaps after all this is not so very far wrong; being found at the same level as the Buddha and the bricks and also a seal apparently of the 5th century A. D., an impression of which will be exhibited at the next meeting of the Society, the presumption is that they are of about the same date, and they may be the finials of miniature Buddhist stupas.

A specimen of the bricks, of which upwards of a thousand have been found, is sent also with the vases.

LIBRARY.

The following additions have been made to the Library since the meeting held in May last.

TRANSACTIONS, PROCEEDINGS AND JOURNALS,

presented by the respective Societies and Editors.

Berlin. K. preussische Akademie der Wissenschaften,—Monatsbericht, December 1880.

Bombay. The Indian Antiquary,—Vol. X, Pt. 119, May 1881.

Bordeaux. Société de Géographie Commerciale,—Bulletin, Nos. 7—9.

Calcutta. Register of Meteorological Observations for April 1880.

———. Indian Meteorological Memoirs,—Vol. I, Part 5.

Dresden. Kais. Leopoldinisch-Carolinische Deutsche Akademie der Naturforscher,—Nova Acta. Vols. XXXIX—XL.

- Geneva. Museo Civico di Storia Naturali,—Annali, Vol. XVI.
- Liège. Société Géologique de Belgique,—Annales, Vol. VI.
- Lisbon. Sociedad de Geographia,—Boletin, Second series, No. 3.
- London. Royal Society,—Proceedings, Vol. XXXI, No. 210.
- . Royal Geographical Society,—Proceedings, Vol. III, No. 4, April 1881.
- . Anthropological Institute of Great Britain and Ireland,—Journal Vol. X, No. 2, November 1880.
- . The Academy,—Nos. 467—470.
- . The Athenæum,—Nos. 2790—2793.
- . Nature,—Vol. XXIII, Nos. 589 and 599.
- Paris. La Société de Géographie,—Bulletin, Vol. I, January 1881.
- Rhins, J. Dutreuil de.*—Routes entre la Chine et l'Inde.
- Roma. Società degli Spettroscopisti Italiani,—Memorie, Vol. X, Dispensa 2, February 1881.
- Turin. R. Accademia delle Scienze,—Atti, Vol. XVI, Disp. 1—3.
- Washington. United States Geological and Geographical Survey of the Territories,—Bulletin, Vol. VI, No. 1.
- Gray, A. and Hooker, J. D.*—The vegetation of the Rocky mountain Region and a comparison with that of other parts of the world. *Cope, E. D.*—On some new *Batrachia* and *Reptilia* from the Permian Beds of Texas. *Cope, E. D.*—On a wading Bird from the Amyzon Shales. *Schufeldt, R. W.*—Osteology of *Speotyto Cunicularia* var. *Hypogaea*. *Schufeldt, R. W.*—Osteology of *Eremophila Alpestris*. *Grote, A. R.*—Preliminary List of the North American Species of *Agrotis*, with descriptions. *Cope, E. D.*—On the *Nimravidea* and *Canida* of the Miocene Period. *Cope, E. D.*—On the Vertebrata of the Wind River Eocene Beds of Wyoming.
- Zagreb. Arkeologickoga Druzstva,—Viestnik, Vol. III, No. 2.

BOOKS AND PAMPHLETS,

presented by the Authors.

- BEVERLEY, H. Report on the Census of the Town of Calcutta taken on the 6th April 1876. Fcp., Calcutta, 1876.
- GHOSHIA, RAMACHANDRA. The Indo-Aryans, their History, Creed and Practice. Demi Svo., Calcutta, 1881.
- NOER, GRAF. F. A. Kaiser Akbar; ein Versuch über die Geschichte Indiens in sechzehnten Jahrhundert, Part 2. Svo., Leiden, 1881.

MISCELLANEOUS PRESENTATIONS.

- SEWELL, R. Report on the Amaravati Tope, and excavations on its site in 1877. 4to., London, 1880.
- Report of the Calcutta Court of Small Causes for the year 1880. Fcp., Calcutta, 1881.

Selections from the Records of the Government of India, Home, Revenue and Agricultural Department, No. 174. Reports on publications issued and registered in the several provinces of British India during the year 1879. 8vo., Calcutta, 1881.

The Indian Forester, Vol. VI, No. 4.

BENGAL GOVERNMENT.

The Indian Antiquary, Vol. X, Part 119, May 1881.

FALLON, S. W. A new English-Hindustani Dictionary, Part 3, May 1881. 8vo., Benares, 1881.

HOME, REVENUE AND AGRICULTURAL DEPARTMENT.

Report on the Police Administration of the Central Provinces for the year 1880. Fcp., Nagpur, 1881.

Report on the Jails of the Central Provinces for the year 1880. Fcp., Nagpur, 1881.

CHIEF COMMISSIONER, CENTRAL PROVINCES.

Annual Report on the Civil Hospitals and Dispensaries in the Madras Presidency for the year 1879. Fcp., Madras, 1880.

MADRAS GOVERNMENT.

Reports of Prof. Joseph Henry, Secretary of the Smithsonian Institution, 8vo., Washington, 1867-76.

SMITHSONIAN INSTITUTION.

PERIODICALS PURCHASED.

Calcutta. Indian Medical Gazette,—Vol. XVI, No. 5, May 1881.

Göttingen. Gelehrte Anzeigen,—Nos. 17—19.

Leipzig. Annalen der Physik und Chemie,—Vol. XII, No. 4.

———. Beiblätter,—Vol. V, No. 4.

London. Journal of Botany,—Vol. X, No. 220.

Clarke, C. B.—A revision of the Indian species of *Lea*. The Coffee-leaf Disease.

———. London, Edinburgh and Dublin Philosophical Magazine, Vol. XI, No. 68.

———. The Journal of Science,—Vol. III, No. 88.

———. Annals and Magazine of Natural History,—Vol. VII, No. 40.

Distant, W. L.—Description of a new Longicorn Beetle from Java. Carter, H. J.—On the Kunker Formation of the Alluvium in India compared with the Flint Formation in the chalk of England. Wood-Mason, J.—Description of *Parantirrhæa Marshalli*, the Type of a new Genus and Species of Rhopalocerous Lepidoptera from South India. A History of the Birds of Ceylon, by Capt. W. V. Legge.

———. Entomologist,—Vol. XIV, No. 215.

———. Entomologist's Monthly Magazine,—Vol. XVII, No. 203.

Pryer, W. B.—Tropical notes. Distant, W. L.—Description of a new species of *Lyconidae* from Penang. Lewis, G.—New species of *Helotidae* from Japan.

- London. Mind,—No. 22, April 1881.
- . Numismatic Chronicle,—Vol. XX, No. 80.
- . Publishers' Circular,—Vol. XLIV, Nos. 1046—1047.
- . Chemical News,—Vol. XLIII, Nos. 1116—1119.
- No. 1118. *Pickering, S. U.*—Notes on the Oxides of Manganese.
- . Society of Arts,—Journal, Vol. XXIX, Nos. 1482—1485.
- No. 1485. *MacLagan, Genl.*—Indian Section. The Building Arts of India.
- New Haven. American Journal of Science,—Vol. XXI, No. 123.
- Paris. Comptes Rendus,—Vol. XCII, Nos. 14—17.
- No. 16. *Marey, M.*—Inscription microscopique des mouvements qui s'observent en Physiologie. *Gylén, M.*—Sur l' intégrale eulérienne de seconde espèce.
- No. 17. *Faye, M.*—Sur une question de Métrologie ancienne; origine du mile anglais.
- . Revue Scientifique,—Vol. XXVII, Nos. 16—19.
- No. 18. *Vélain, Ch.*—L' Algérie et la Pays des Kroumirs. *Rochas, de.*—Le Traité des gaz, par Héron d'Alexandrie.
- No. 19. *Verneuil.*—Du paludisme considéré au point de vue chirurgical.
- . Revue des deux Mondes,—Vol. XLIV, No. 4, Vol. XLV, No. 1.
- . Revue Critique,—Vol. XI, Nos. 15—18.
- . Journal des Savants,—April 1881.

BOOKS PURCHASED.

- BOULGER, DEMETRIUS CHARLES. History of China, Vol. I. 8vo., London, 1881.
- MÜLLER, MAX. Sacred Books of the East, Vol. X. 8vo., Oxford, 1881.
- TYLOR, EDWARD B. Anthropology: an Introduction to the Study of Man and Civilization. Demi 8vo., London, 1881.



PROCEEDINGS
OF THE
ASIATIC SOCIETY OF BENGAL.
FOR JULY, 1881.

The Monthly General Meeting of the Asiatic Society of Bengal was held on Wednesday, the 6th July 1881, at 9.15 P. M.

C. H. TAWNEY, Esq., M. A., Vice-President, in the Chair.

The minutes of the last Meeting were read and confirmed.

The following presentations were announced—

1. From the Home, Revenue and Agricultural Department,—Shering's Hindu Tribes and Castes, vol. III.

2. From the authors,—(1) *Die Culturländer des alten America ; Die Voelker des oestlichen Asien : Studien und Reisen*, vols. I, II and IV ; *Beiträge zur Ethnologie und darauf begründete Studien ; Mexico : Vortrag*, gehalten in der Sing-Academie am 18 Januar 1868 ; and *Remarks on the Indo-Chinese Alphabets*, by Dr. A. Bastian, (2) Report on accessions to our knowledge of the Chiroptera during the past two years (1878-80) ; Report on the Geographical Distribution of the Chiroptera ; and *Sur quelques espèces de Chiroptères provenant d'une collection faite en Algérie* par M. Fernand Lataste, by Dr. G. E. Dobson, (3) *Bibliographie Générale de l'Astronomie*, vol. II, pt. 2, by J. C. Houzeau and A. Lancaster, (4) *Govinda Gitika* by Raja Mahendralala Khan.

3. From the Panjab Government,—Glossary of the Multani Language compared with the Panjabi and Sindhi, by E. O'Brien.

4. From the Geological Society of London,—Catalogue of the Library of the Geological Society of London.

5. From A. W. Franks, Esq.,—List of Drawings from the Amravati Tope, Southern India, made for Col. C. Mackenzie, 1816-19, and preserved in the Library of the India Office.

6. From the Political Agent and Superintendent, Charkharee,—twelve copper coins.

The following Gentleman, duly proposed and seconded at the last meeting, was elected an Ordinary Member of the Society :

Prince Firukh Shah.

The following Gentleman is a candidate for election at the next meeting :

H. C. Barstow, Esq., C. S., Magistrate and Collector, Cawnpore, proposed by H. Rivett-Carnac, Esq., C. S., seconded by Dr. G. Thibaut.

The COUNCIL announced that the report of the Auditors of the Society's Accounts had been received, and that the suggestion of the Auditors, that the stock of Books be not entered as an Asset, had been approved.

Dr. HOERNLE exhibited a wax impression of a curious old seal of baked clay, found by Mr. Growse at Bulandshahr, and read the following note on the same and on the vases exhibited at the last meeting by Mr. Growse :

"My excavations at the Moti Bagh are still in progress and this morning the workmen turned up a curious old seal of baked clay, of which I enclose an impression. The oval is divided by two parallel lines into two equal compartments, in the upper of which are two devices, the one a conch shell, the other—which is raised on a little stand—looks like a wing and may possibly be intended for a *chakwá*. In the lower compartment is a name in early characters, probably of about the 5th century A. D., which I read as Sattila.

I have no doubt now that the vases exhibited at the last meeting are the finials of miniature Buddhist stupas, such as are not unfrequently found in old *kheras*. At first I looked upon them as too modern to allow of this suggestion holding good ; but this discovery, on the same spot and at no greater depth, first of a Buddhist sculpture with an inscription in characters of about the 8th century A. D., and now of this seal which may be some 2 or 3 centuries older still, renders it probable that they too may be referred to a period equally remote, when Buddhism was the predominant religion of the neighbourhood."

Mr. BALL exhibited an ancient stone implement made of magnetic iron ore, and said that he was indebted for it to Mr. W. G. Olpherts, to whom it had been sent simply as a specimen of iron ore. Its history had not yet been fully ascertained but it was believed to have been obtained somewhere in the Narbada valley.

The material, magnetic oxide of iron, containing perhaps from 60 to 70 per cent. of iron, though admirably suited on account of its weight and toughness for making into a chipped implement, does not appear to have been often so employed. The present is in fact the only known specimen.

It might be suggested by some that the use of this material was a step in the direction of the substitution of iron for stone; but it would be difficult to prove such a proposition.

The following papers were read—

1. *The Revenues of the Mughal Empire in India*.—By EDWARD THOMAS, F. R. S., late Bengal C. S.

(Abstract.)

In Volume XLIX of the Journal of the Society a paper was published by Mr. C. J. Rodgers on the "Copper Coins of Akbar," in which he entered into some speculations on the amount of the State Revenue of that monarch, based upon new interpretations of the legends of his coins, and considerably differing from the calculations of Mr. E. Thomas, in his "Revenue resources of the Mughal Empire." The present paper is a brief reply by Mr. Thomas. After mentioning that his calculations have been accepted as correct by Dr. Hunter, Mr. C. Markham and others, he shows that one of Mr. Rodgers' main arguments, based on his reading the word *dám* on Coin No. 4, falls to the ground, inasmuch as the word is not *dám*, but *damrá* (i. e., a double *damri*). He similarly shows that Mr. Rodgers' second main argument is based on a confusion of the terms *tankah* and *tánke*.

This paper will be published in full in the Journal, Pt. I, No. 2, for 1881.

2. *Description of a new species of Butterfly belonging to the genus Dodona*.—By LIONEL DE NICEVILLE.

[Received June 24th; Read July 6th, 1881.]

DODONA LONGICAUDATA, n. sp.

♂ **UPPERSIDE** deep shining brown. *Fore wing* crossed before the middle by a broad white band which does not quite reach the costa, being narrowest at that point and divided by the nervules into two small spots. This band has its inner margin straight, the outer margin evenly convex. A submarginal series of six white spots placed irregularly. An indistinct marginal series of linear spots. *Hind wing* with the white band of the fore wing continued in a wedge-shaped figure across the disc of the wing, ending in a point just below the first submedian nervure. Abdominal

area paler, with an indistinct white band from the base, and another short transverse one above the anal angle. Incomplete submarginal and marginal bands of white linear spots. Anal lobe black, encircled by a white line and thickly irrorated with white scales. *Tail* long, black; tip and cilia white.

UNDERSIDE rich bright brown, crossed by several silvery-white bands. *Fore wing* with narrow basal and subbasal bands, then a broad median band coincident with the band above but not reaching the costa; a short narrow costal band; then a very irregular broad band which is broken up into spots on the inner side below its middle; and lastly a marginal series of seven spots, the two upper ones rounded and out of line, the rest increasing, linear. The ground-colour near the outer angle becoming darker and almost forming two dark brown spots. *Hind wing* with the two basal and broad median bands as in the fore wing, but all meeting above the anal angle, at which point they are joined by two other white bands traversing the abdominal area. There is also a fourth band from the costa, short, narrow, submarginal, reaching the discoidal nervule, between which and the broad median band there is another narrow white line not reaching the costa, in continuation of which is an orange fascia terminating on the abdominal margin in a black linear spot, and bearing two black rounded spots at its upper extremity. Submarginal and marginal white lines. Anal lobe jet-black, surmounted by a black, white-irrorated space ending in a black spot on the abdominal margin, which space is divided from the lobe by a white line.

CILIA of *fore wing* brown, except a small portion near the inner angle; of the *hind wing*, alternately brown and white.

BODY above deep brown, with a somewhat rufous collar; beneath, white, with a black median abdominal line.

LEGS. The atrophied fore legs are pure white, the two posterior pairs have their tibiae and tarsi ocraceous.

ANTENNAE black, annulated with white.

A single specimen taken by the late Mr. J. P. Cock near Shillong, Assam, in November.

This species seems nearest allied to *Dodona deodata*, Hewitson, from Moulmein, figured in Plate I of Moore's "Desc. new Indian Lep. from coll. Atkinson," Part I, 1879, from which species it may readily be distinguished on the upperside in having only one median white band, being in fact altogether a much darker insect. *D. deodata* is apparently tailless, or the tails are rudimentary.

This is only the eighth species of this very interesting and compact little genus (all of which occur in India) as yet described. It is remark-

able for the length of its tails, which are quite twice as long as those of *D. egeon*, Doubl. Hew., which species has them the next longest of the genus. It will be figured in the forthcoming work on 'The Butterflies of India, Burmah and Ceylon,' by Captain Marshall and myself.

3. *Sketch of the history of the fossils of the Indian Gondwana system.*—By O. FEISTMANTEL, M. D., *Palaeontologist, Geological Survey of India.*

(Abstract.)

The fossils of the Indian Gondwana system, the most important series of sedimentary rocks in Peninsular India, have been now under examination for several years, and various memoirs have been published containing descriptions and illustrations of the vegetable and animal remains of this important rock-system. These fossils have been, however, hitherto treated of in a stratigraphical order only, according to the groups from which they were procured. A general review of the fossils in a biological order was hitherto wanting, and as only lately Mr. R. Lydekker gave a sketch of the history of the fossil Vertebrata in India in the *Journal of the Asiatic Society of Bengal*, the author thought it would prove of some use to write a similar sketch of the Gondwana fossils for publication in the same *Journal*.

A general review of the literature referring to Gondwana fossils is given, also a review of the various groups of the system with regard to the occurrence of fossils in them; then follows the enumeration of the fossils (vegetable and animal) in a systematical (biological) order, with indication of their geological and geographical distribution, and a few general remarks on the peculiarities of the fossils of this system conclude the paper.

This paper will be published in full in the *Journal*, Pt. II, No. 3, for 1881.

4. *New and little known Mollusca belonging to the Indo-Malayan Fauna.*—By GEOFFREY NEVILL, C. M. Z. S.

(Abstract.)

This paper contains complete descriptions of certain species of Mollusca which were only briefly described in the author's 'Hand-list.'

The plates include figures of most of the shells previously described by Mr. Nevill, but of which no illustrations have hitherto been published: thus one of the plates represents the brackish-water shells described in the *Journal*, Pt. II, No. 3, 1880.

In addition to the above there are descriptions of many new and important species lately discovered by Surgeon-Major R. Hungerford at

the Philippines, in Formosa, &c., as well as of some new *Rissoina* which are being figured by Dr. Weinkauff for the forthcoming monograph in the new edition of the well known standard work, the 'Conchylica Cabinet.'

A new species of the brackish-water genus *Fairbankia*, which was discovered by Mr. F. Fedden 10 feet below the surface in Káthiáwár, is also described.

In his preface Mr. Nevill alludes to the unmerited oblivion into which some upper cretaceous *Helicidae* described by Dr. Stoliczka appear to have fallen. The author also makes some observations on the distribution and probable origin of the land Mollusca of the Madagascar region in connection with some remarks by Mr. A. R. Wallace in his recent work 'Island Life.'

This paper will be published in the Journal, Part II, No. 3, for 1881.

MR. FEDDEN said:—I may mention that the Rissoid shell from the Rann, described in Mr. Nevill's paper, and placed by him somewhat doubtfully in the genus *Fairbankia*, was obtained, together with about a dozen other semi-fossil shells, from a clay bed ten feet below the surface of the "Little Rann" (as it is called, on the north side of Káthiáwár)—the bed from which the brine is obtained at the salt works near Kúra (or Kúda) in the Dhrangadra State. There is first the surface soil, an earthy clay, then a dark plastic clay, thirdly a brown clunch, a close stiff clay, and fourthly the fossiliferous clay, which is dark bluish and plastic, highly saline and gypseous (crystals of gypsum). The base was not reached in the brine pits. From this lower clay I obtained by washing a number of small shells, among which are the following:—

Pirenella, probably two species of this prettily marked shell, the most numerous.

Along with these a few specimens of *Tympanotomus fluviatilis*, (one of the *Cerithiidae*), now common on the coast near the mouths of streams.

Assiminea, a sub-genus of *Rissoa*, and one or two other Rissoids.

A pretty little *Melampus*, probably a variety of *M. striatus*.

Then there are apparently two species of the minute shell *Stenothyra*; one species is *minima*, the other I should call *major*, if new.

There is also a little shell that Mr. Nevill thinks may be a new species of the rare genus *Theora*, and of bivalves a *Glaucomya* (*Glaucanome*), near, if not identical with, the Chinese species (*Chinensis*), a common borer in tidal mud banks, and one or two other shells not yet examined.

It will be seen that the collection, though small, is of some interest to the Conchologist as well as the Geologist. The general *facies* presents a mingling of brackish-water with marine forms, and, considering that the locality is situated 65 miles from the present head of the Gulf of

Kachh, tends strongly to confirm the supposition that the Rann was an annex of the sea not very long ago, but was given up, and, on being evacuated, became silted up.

5. *Additional remarks on the Identification of Ancient Diamond Mines in India.*—By V. BALL, M. A., F. G. S.

(Abstract.)

In this paper the author finally adopts the view that the mine called Raolconda by Tavernier is identical with the modern Ramulkota. In his previous paper he named this as the alternative in the event of Rawduconda not being the place. With the aid of Mr. King the localities mentioned by Tavernier as intervening between Golconda and Raolconda have been fully identified with places between Golconda and Ramulkota where there are still traces of former extensive mines.

One consequence of this is that the measure of distance called the *gos* by Tavernier must have been 8 miles, and the league of Tavernier was not the French league, but a paraphrase for the elastic *cos*.

The present paper confirms the previous identifications as to other mines and includes information illustrative of several points in the original communication.

This paper will be published in the Journal, Pt. II, No. 3, for 1881.

The following communication has been received :

"The Electric Telegraph and Natural History" by W. MacGregor.

LIBRARY.

The following additions have been made to the Library since the meeting held in June last.

TRANSACTIONS, PROCEEDINGS AND JOURNALS,

presented by the respective Societies and Editors.

Batavia. *Natuurkundig Tydschrift voor Nederlandsch Indië*, Vol. XL.

Berlin. *K. preussische Akademie der Wissenschaften*,—*Monatsbericht*, January 1881.

Bombay. *The Indian Antiquary*,—Vol X, Part 120, June 1881.

Bordeaux. *Société de Géographie Commerciale*,—*Bulletin*, Nos. 10 and 11.

Brussels. *L'Académie Royale des Sciences, des Lettres et des Beaux Arts de Belgique*,—*Annuaire*, 1879, 1880 and 1881.

Brussels. L'Académie Royale des Sciences, des Lettres et des Beaux Arts de Belgique,—Bulletins, Vol. XLVI—L, 1878—1880.

———. ———. Mémoires Couronnés,—Vols. X—XIV, XXIX—XXX and XXXII.

———. ———. Mémoires Couronnés et des savants étrangers,—Vols. XXVIII—XXX, XXXIX, Part 2, XLII and XLIII

———. ———. Mémoires,—Vols. XXXI—XXXIII, and XLIII, Part 1.

Calcutta. Registers of Original Meteorological Observations,—May 1880.

Copenhagen. Société Royale des Antiquaires du Nord,—Mémoires, 1878-79.

———. Tilføeg til Aarbøger for Nordisk Oldkyndighed og Historie, 1877 and 1878.

Edinburgh. Royal Society of Edinburgh,—Transactions, Vol. XXIX, Part 2, 1879-80.

Schulze, Prof. F. E.—On the structure and arrangement of the soft parts in *Euplectella aspergillum*. Communicated by Sir Wyville Thomson.

———. ———. Proceedings,—Vol. X, Nos. 105—107.

Brander, Surgeon E. S.—Remarks on the Aboriginies of the Andaman Islands.

———. Botanical Society,—Transactions and Proceedings, Vol. XIV, Part 1.

Traill, Dr. W.—On the growth of the New Zealand Flax Plant (*Phormium tenax*) in the Orkney Islands. Christison, Sir R.—On the exact measurement of Trees (Part 4). The Influences of the unfavourable Season of 1879 on the growth of Trees. Thomson, G. M.—The flowering plants of New Zealand, and their relation to the Insect Fauna. Communicated by Professor Balfour.

Geneva. Société de Physique et d'Histoire Naturelle,—Mémoires, Vol. XXVII, Part 1.

Duby, M. J. E.—Choix de mousses exotiques nouvelles ou mal connues. Monographie des *Echinides* contenus dans les couches nummulitiques de l'Égypte.

Leipzig. Deutsche morgenländische Gesellschaft,—Abhandlungen für die Kunde des morgenlandes,—Vol. VII, No. 2.

London. Society of Telegraph Engineers,—Journal, Vol. X, No. 35, March 1881.

———. Royal Microscopical Society,—Journal, Vol. I. Part 2, (Ser. II) April 1881.

———. Royal Geographical Society,—Proceedings, Vol. III, No. 5, May 1881.

———. Royal Asiatic Society of Great Britain and Ireland,—Journal, Vol. XIII, Part 2, April 1881.

———. Royal Institution,—Proceedings, Vol. IX, Part 3, No. 72.

———. ———. List of Members, 1880.

- London. Royal Astronomical Society,—Monthly Notices, Vol. XLI, No. 5, March 1881.
- . The Academy,—Nos. 471—475.
- . The Athenæum,—Nos. 2795—2798. *
- . Nature,—Vol. XXIII, No. 595, and Vol. XXIV, Nos. 602—605.
- Munich. K. b. Akademie der Wissenschaften,—Sitzungsberichte der philosophisch-philologischen und historischen Classe,—Vol. I, Parts 4—5, 1880.
- . ———. Mathematisch-physikalische Classe, Vol. XXIII, Part 1, 1881.
- . ———. Abhandlungen, philosophisch-philologische Classe, Vol. XV, Part 3.
- . ———. Historische Classe, Vol. XV, Part 3.
- Paris. La Société de Géographie,—Bulletin, February 1881.
- . La Société Zoologique,—Bulletin, Parts 5 and 6, July to December 1880.
- Pisa. Società Toscana di Scienze Naturali,—Atti, Processi Verballi, 13th March 1881.
- Rome. Società degli Spettroscopisti Italiani,—Memorie, Vol. X, Nos. 3 and 4, March and April 1881.
- Roorkee. Professional Papers on Indian Engineering,—Vol. X, No. 40, April 1881.
- Schaffhausen. Société Entomologique Suisse,—Bulletin, Vol. VI, No. 3, February 1881.
- Rougemont, Ph. de.—Observations sur l'organe détonant du *Brachinus crepitans* Oliv. Puton, Dr.—Enumeration des Hémiptères recoltés en Syrie par M. Abeille de Perrin avec la description des espèces nouvelles. Gossner E. Frey.—Syrische Hemiptern.
- The Hague. Bijdragen tot de Taal-Land-en Volkenkunde von Nederlandsch-Indië, Vol. III, No. 3, and Vol. IV, Nos. 3 and 4.
- Turin. R. Accademia delle Scienze,—Atti, Vol. XVI, Disp. 4, March 1881.
- Vienna. Anthropologische Gesellschaft,—Mittheilungen, Vol. X, Nos. 8—9.
- . K. K. Geologische Reichsanstalt,—Abhandlungen, Vol. XII, Part 2.
- Hoernes, R. and Auinger, M.—Die Gasteropoden der Meeres-Ablagerungen der ersten und zweiten Mioänen Mediterran-Stufe in der österreichisch-ungarischen Monarchie.
- . ———. Jahrbuch, Vol. XXX, No. 4.
- . ———. Verhandlungen, Jahrgang, 1880, Nos. 12—18.
- Wellington. New Zealand Institute,—Transactions and Proceedings, Vol. XIII, 1880.
- Yokohama. Deutsche Gesellschaft für Natur und Völkerkunde Ostasiens,—Mittheilungen, April 1881.

BOOKS AND PAMPHLETS

presented by the Authors.

- BASTIAN, Dr. Adolf. *Die Culturländer des alten America*, 2 vols. 8vo., Berlin, 1878.
- . *Die Voelker des oestlichen Asien. Studien und Reisen*, Vols. I, II, and IV, 8vo., Leipzig, 1866-68.
- . *Beiträge zur Ethnologie und darauf begründete Studien*, 8vo., Berlin, 1871.
- . *Mexico. Vortrag, gehalten in der Sing-Academie am 18 Januar 1868*, 8vo., Berlin, 1874. Pam.
- . *Remarks on the Indo-Chinese Alphabets*. 8vo., London, 1867. Pam.
- DOBSON, G. E. *Report on accessions to our Knowledge of the Chiroptera during the past two years (1878—80)*. 8vo., London. Pam.
- . *Report on the Geographical Distribution of the Chiroptera*. 8vo., London. Pam.
- . *Sur quelques espèces de Chiroptères provenant d'une collection faite en Algérie par M. Fernand Lataste*. 8vo., Paris, 1881. Pam.
- FRANKS, A. W. *List of drawings from the Amaravati Tope, Southern India, made for Colonel C. Mackenzie 1816-19, and preserved in the Library of the India Office. (Privately printed.)* 8vo., Westminster 1881. Pam.
- HOUZEAU, J. C. and LANCASTER, A. *Bibliographie Générale de l'Astronomie, ou Catalogue Méthodique des Ouvrages, des Mémoires et des Observations Astronomiques publiés depuis l'origine de l'imprimerie jusqu'en 1880*. Vol. II, Part 2. 8vo., Brussels, 1881.

MISCELLANEOUS PRESENTATIONS.

- Tables des Mémoires des Membres, des Mémoires Couronnés et des Mémoires des Savants E'trangers (1858—78)*. Sm. 8vo., Brussels, 1879.
- ACAD. ROYALE DES SCIENCES DE BELGIQUE.
- Report of the Alipore Reformatory School for the year 1880*. Fcp., Calcutta, 1881.
- Annual Report of the Police Administration of the Town of Calcutta and its Suburbs for the year 1880*. Fcp., Calcutta, 1881.
- Annual Report on the Insane Asylums in Bengal for the year 1880*. Fcp., Calcutta, 1881.
- Records of the Geological Survey of India, Vol. XIV, Part 2*, 1881.

Report on the Calcutta Medical Institutions for the year 1880. Fep., Calcutta, 1881.

BENGAL GOVERNMENT.

KIELHORN, Dr. F. Report on the search for Sanskrit MSS. in the Bombay Presidency during the year 1880-81. 8vo., Bombay, 1881.

BHANDARKAR, R. G. Report on Sanskrit MSS. Fep., Bombay, 1880.

BOMBAY GOVERNMENT.

Report on the Lunatic Asylums in the Central Provinces for the year 1880. Fep., Nagpur, 1881.

Report on the Nagpur School of Medicine, Central Provinces, for the year 1880-81. Fep., Nagpur, 1881.

Report on the Working of the Registration Department in the Central Provinces for the year 1880. Fep., Nagpur, 1881.

Report on the Working of the Charitable Dispensaries in the Central Provinces for the year 1880. Fep., Nagpur, 1881.

CH. COMMISSIONER, CENTRAL PROVINCES.

DALLAS, J. Catalogue of the Library of the Geological Society of London. 8vo., London, 1881.

GEOLOGICAL SOCIETY, LONDON.

General Report on the Operations of the Survey of India during 1879-80. Fep., Calcutta, 1881.

Records of the Geological Survey of India, Vol. XIV, Part 2, 1881.

The Indian Antiquary, Vol. X, Part 120, June 1881.

HOME, REVENUE AND AGRICULTURAL DEPARTMENT.

General Report on the Operations of the Marine Survey of India for the year 1879-80. Fep., Calcutta, 1881.

MARINE SURVEY DEPARTMENT.

O'BRIEN, E. Glossary of the Multani Language compared with Panjabi and Sindhi. 4to., Lahore, 1881.

PANJAB GOVERNMENT.

PERIODICALS PURCHASED.

Benares. Fallon's New English-Hindustani Dictionary, Part 3, May 1881.

Calcutta. Indian Medical Gazette,—Vol. XVI, No. 6, June 1881.

Giessen. Jahresbericht über die Fortschritte der Chemie, Part 3 of 1879.

Göttingen. Gelehrte Anzeigen,—Nos. 20-24, 1881.

———. Nachrichten,—No. 8, April 1881.

Leipzig. Annalen der Physik und Chemie,—Vol. XIII, Part 1.

London. Journal of Conchology,—Vol. III, No. 5, January 1881.

———. Journal of Botany,—Vol. X, No. 221, May 1881.

Clarke, C. B.—A revision of the Indian Species of *Leuca*. Hance, H. F.—On a new Chinese *Senecio*.

London. Journal of Science,—Vol. III, No. 89, May 1881.

———. Quarterly Review,—Vol. CLI, No. 302, April 1881.

———. Edinburgh Review,—Vol. CLIII, No. 314, April 1881.

———. The Ibis,—Vol. V, No. 18, April 1881.

Hargitt, E.—Notes on Woodpeckers.—No. 1, On the *Piculets* of the Old World.

Gurney, J. H.—Notes on a 'Catalogue of the *Accipitres* in the British Museum,' by R. Bowdler Sharpe (1874). Burbridge's 'Gardens of the Sun,' Sharpe on New Birds from New Guinea.

———. Quarterly Journal of Microscopical Science,—Vol. XXI, No. 82, April 1881.

Cunningham, D. D.—On the development of Certain Microscopic Organisms occurring in the Intestinal Canal.

———. Annals and Magazine of Natural History,—Vol. VII, No. 41, May 1881.

Günther, Dr. A.—Seventh Contribution to the Knowledge of the Fauna of Madagascar. *Nicéville, Lionel de.*—Note on *Papilio nebulosus*, Butler. *Butler, A. G.*—On a collection of Nocturnal *Lepidoptera* from the Hawaiian Islands. *Waterhouse, C. O.*—Description of two new Longicorn *Coleoptera* and a new Genus of *Dynastidae*. *Waterhouse, C. O.*—Description of a new species of the Coleopterous Genus *Dryops* from Pekin (Family *Parnidae*). *Wood-Mason, J.*—Description of a new Cornuted Species of *Cetonidae* from North-Eastern India.

———. Philosophical Magazine,—Vol. XI, No. 69, May 1881.

———. Messenger of Mathematics,—Vol. X, No. 11, March 1881.

———. The Entomologist,—Vol. XIV, No. 216, May 1881.

Goock, W. D.—Butterfly hunting in Natal, on the Coast-lands.

———. The Entomologist's Monthly Magazine,—Vol. XVII, No. 204, May 1881.

———. The Nineteenth Century,—Vol. IX, No. 50—51. April and May 1881.

———. Society of Arts,—Journal, Vol. XXIX, Nos. 1486—1489.

No. 1486. *Westgarth, W.*—Foreign and Colonial Section:—Trade Relations of the Colonies and the mother Country.

———. The Publishers' Circular,—Vol. XLIV, Nos. 1048—1049.

———. Chemical News,—Vol. XLIII, Nos. 1120—1124.

No. 1120. *Pickering, S. U.*—Notes on the Oxides of Manganese. *Prud'Homme, Maurice.*—Dyeing Reds with Artificial Alizarin.

No. 1121. *Pickering, S. U.*—Notes on the Oxides of Manganese. *Romanis, R.*—Analyses of Rico Soils from Burmah.

New Haven. American Journal of Science,—Vol. XXI, No. 124, April 1881.

Paris. Annales de Chimie et de Physique,—Vol. XXII, April 1881.

Bertin, M. A.—Étude sur les Miroirs magiques.

———. Revue de Linguistique,—Vol. XIV, Fasc. 2, April 1881.

Vinson, J.—Les premiers Grammairiens basques.—Notes de Silvain Pourreau.

Vinson, J.—Les basques du XII^e siècle.—Leurs mœurs et leur langue.

Vinson, J.—Spécimen de la poésie cavaiste du sud de l'Inde.

- Paris. Journal Asiatique, —Vol. XVII, No. 2, February—March 1881.
——. Revue Critique, —Vol. XI, Nos. 19—22, May 1881.
——. Revue des deux Mondes, —Vol. XLV, 15th May and 1st June 1881.
——. Comptes Rendus, —Vol. XCII, Nos. 18—22, May 1881.
No. 18. *Jamin, J.*—Sur la force électromotrice inverse de l'arc électrique.
Gylden,—Sur les inégalités à longues périodes dans les mouvements des corps célestes.
——. Revue Scientifique, —Vol. XXVII, Nos. 20—24.
No. 20. *Rolland, G.*—Les grandes dunes de Sable du Sahara. De certaines immunités physiologiques de la race Juive.
——. Journal des Savants, May 1881.
Philadelphia. Tryon's Manual of Conchology, Part 10.

BOOKS PURCHASED.

- DAVIDS, T. W. RHYS. Buddhist Birth Stories; or Jataka Tales. The oldest collection of Folk-Lore extant, being the Jatakathàvannana. Translation. Vol. I. 8vo., London, 1880.
Encyclopædia Britannica, ninth edition, Vol. XII, Hir.—Ind. 4to., Edinburgh, 1881.
FAULMANN, C. Das Buch der Schrift enthaltend die Schriftzeichen und Alphabete aller Zeiten und aller Völker des Erdkreises. 4to., Vienna, 1880.
LE CONTE, J. Sight: An Exposition of the Principles of Monocular and Binocular Vision. Dy. 8vo., London, 1881.
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PROCEEDINGS

OF THE

ASIATIC SOCIETY OF BENGAL.

FOR AUGUST, 1881.

The Monthly General Meeting of the Asiatic Society of Bengal was held on Wednesday, the 3rd August 1871, at 9-15 P. M.

C. H. TAWNEY, Esq., Vice-President, in the Chair.

The minutes of the last Meeting were read and confirmed.

The following presentations were announced—

1. From the Bengal Government,—(1) General Rules and Circular Orders of the High Court of Judicature at Fort William in Bengal (Appellate Side; Civil and Criminal), (2) Archæological Survey Reports, Vols. X and XI.

2. From the Bombay Government,—Archæological Survey of Western India, Reports, No. 10, by J. Burgess and Bhagawanlal Indraji.

3. From the German Oriental Society,—(1) *Qolasta*, by Dr. J. Euting, (2) *Epistolæ Novi Testamenti Coptice*, by P. Boetticher, (3) *Indische Studien*, Vol. X, Nos. 1, 2 and 3.

4. From the Institution of Mechanical Engineers,—Library Catalogue, May 1881.

5. From the Authors,—*Sanskrit Wörterbuch in kürzerer Fassung*, Pt. II, 2, by O. Böhtlingk; *The Precedents of Princess Thoodamma Tsari*; *Prince Weezaya*, a Burmese drama, translated by Chr. J. Bandow; *The Revenue Resources of the Mughal Empire in India*, from A. D. 1593 to A. D. 1707, by E. Thomas.

6. From K. Zoologisch Genootschap *Natura Artis Magistra*,—*Catalogus der Bibliotheek*.

7. From the Home Department,—(1) Archæological Survey of India, Reports, Vols. X and XI, (2) *On the Manufacture of Iron and the Future of the Charcoal Iron Industry in India*, (3) *Samaveda Sanhita*, Pt. 2.

8. From the Smithsonian Institution,—*Annual Report for the year 1879*.

9. From the Editing Committee,—The Norwegian North Atlantic Expedition ;—Zoology, Fishes ; and Chemistry.

10. From F. C. Black, Esq.,—A stone slab bearing an inscription, found among the ruins of the old fort of Deogarh.

The following Gentleman, duly proposed and seconded at the last meeting, was balloted for and elected an Ordinary Member :

H. C. Barstow, Esq., C. S.

The following Gentleman is a candidate for ballot at the next meeting :

H. M. Percival, Esq., Professor, Presidency College, proposed by C. H. Tawney, Esq., seconded by A. W. Croft, Esq.

The SECRETARY reported that Dr. G. E. Dobson and Babus Dijendranath Tagore and Jogesh Chunder Dutt had intimated their desire to withdraw from the Society.

The SECRETARY reported that the following coins had been acquired under the Treasure Trove Act :

From the Deputy Commissioner of Bahraich,—16 copper coins of Sikander Lodi.

Dr. R. MITRA exhibited a MS. of the Bhaṭṭi Kāvya in Bengali characters, 478 years old, and read the following note regarding it.

Note on a Manuscript of the Bhaṭṭi Kāvya.—By DR. R. MITRA.

I have lately received from my travelling Paṇḍit a MS. of the Bhaṭṭi Kāvya, bearing date Śaka 1326. It is written on yellow paper of Indian manufacture, and comprises 130 folia, each folium measuring $13\frac{1}{2} \times 2\frac{1}{2}$ inches. The writing is in well-formed Bengali letters, differing in no respect from the Bengali writing by Paṇḍits of the last century. The leaves are all stained with water marks, and the colour of the yellow orpiment with which they are dyed is very much faded, bearing unmistakable testimony to the age of the MS. The number of lines on each page is 6, except on a few pages where only 5 lines are written. The colour of the ink is well preserved, except in the marginal notes written at different times by different persons. The name of the scribe is Puruṣottama Deva Śarmā. A facsimile of the last page is given in plate II.

The work is a standard text-book on grammar in Indian schools, and has already been printed several times, but the codex under notice is the oldest that has yet been discovered, and is worthy of notice from the fact of its being remarkably correct and containing some new readings.

There are two other circumstances in connexion with the codex which are worthy of note. The first is the name of the work, and the second, the

name of its author. In all the modern MSS. of the work that I have seen the name of the book always appears to be Bhāṭṭi; and the six commentators whose works are accessible to me in Calcutta either call it Bhāṭṭi, or "an epic (*Mahākāvya*) on the history of Rāma." Nowhere is any specific name given for the work. European orientalists, commenting on the work, have invariably used the name Bhāṭṭi, without any doubt or qualification. The MS. under notice, however, gives the specific name *Rāvaṇa-badha* or "the Destruction of Rāvaṇa," and in the colophon of the Serampur edition the same name is to be met with, though it is not given on the title-page. The disuse of the specific name can be attributed to one of two causes; either the author left an only work to posterity, and therefore his name was held enough to indicate his work, as in the cases of *Sisupāla-badha* and the *Kirātārjunīya*, which are best known by the names of their authors, Māgha and Bhāravi; or to the fact of there having been another work of the same name of great renown, the *Rāvaṇabadha* of Pravarasena, and the necessity thence arising for a mark of distinction.

As regards the name of the author, commentators are very much divided in opinion. The MS. under notice makes Bhāṭṭi, son of Śrīdhara Svāmī, to be the author. Its words are इति बहुमीवालयश्रीधरस्वामिस्तुनेर्भट्टिनाक्षयस्य हतो रावणवधे महाकाव्ये तिङ्मन्त्राख्ये लटप्रदर्शने नाम द्वाविंशतितमः सर्गः। The oldest commentator, Jayamaṅgala, calls him Bhāṭṭi, son of Svāmī. His words are लक्ष्यं लक्षणं चोभयदेकत्र विदुषः प्रदर्शितं श्रीस्वामिस्तुनः कविः भट्टिनाम रासकथाययं महाकाव्यं चकार। Harihara, the next in age, follows his predecessor verbatim. Puṇḍarikāksha, the 3rd in order of age, in his *Kalāpa-dīpikā*, calls the poet Bhāṭṭi, but gives no specific name for the work. The fourth, Kandarpa Chakravartī, calls the work Bhāṭṭi, and the author Bhartṛhari. His words are अथ तावन्महामहोपाध्याय श्रीमहेश्वरिचक्रविन् शब्दकाण्डयोर्लक्षणं। The fifth, Vidyāvinoda, makes the author Bhartṛhari, son of Śrīdhara Svāmī: अथ कविना श्रीधरस्वामिस्तुनना महेश्वरिणा सर्वदम्भः। And lastly, Bharata Mallika, who lived at Kānchrāpara in the Hooghly district about 150 years ago, names Bhartṛhari, but does not notice the name of his father: महेश्वरिनामकविः श्रीरासकथाययं महाकाव्यं चकार।

Turning now to the writers of this century, I find the opinion to be equally divided. Colebrooke, in his essay on 'Sanskrit and Prākṛit Poetry,' follows the later commentators and says, "The author was Bhartṛhari, not, as might be supposed from the name, the celebrated brother of Vikramāditya, but a grammarian and poet who was son of Śrīdhara Svāmī as we are informed by one of his scholiasts, Vidyāvinoda. (Essays, vol. II, p. 116). Professor Aufrecht, in his Bodleian Catalogue, speaks of Bhartṛhari, "*cujus liber grammaticus, minime vero Bhāṭṭikāvyaṃ memoratur,*" (p. 175 b)

but in his notices of the *Praudha-manoramā*, (p. 162 b), of the *Subodhā*, (p. 175 a), of the *Amara-kosha*, (p. 182 b), and of the *Sarasvatī-kanthā-bharaṇa*, he cites Bhaṭṭi. In the last named work both Bhaṭṭi and Bhartṛihari have been separately cited. Dr. Bhau Dājī observes that Bhaṭṭi "is popularly believed to have been a son of Bhartṛihari," (Journal, Bombay B. R. A. S., J. 1862, p. 219). Bohlen, reciting a tradition which says "Vikrama in fact got possession of the kingdom and took to himself Bhaṭṭi as prime minister," remarks, "in this again they seem to have gone wrong, confounding both persons and times. For there exists a grammatical poem called Bhaṭṭi Kāvya, describing at the same time the exploits of Rāma, which has been attributed to a certain grammarian belonging to a later age called Bhartṛihari, and from the name of this poem, I think, Bhaṭṭi seems to have been considered as the brother of this our Bhartṛihari." (Preface to his edition of the *S'atakas* of Bhartṛihari, p. 6). In a note in the *Indian Antiquary* (I, p. 319) Paṇḍit Śeṣhagiri Śāstrī gives a story (noticed also by Bohlen) which says that "a Brāhmaṇ, named Chandra-gupta, had four wives, one of the Brāhmaṇ caste, another of the Kshatriya, the third of the Vaiśya, the fourth of the Śūdra caste. They were called Brāhmaṇī, Bhānumatī, Bhāgyavatī and Sindhumatī. Each of the four bore him a son. Vararuchi was born of the first wife, Vikramārka of the second, Bhaṭṭi of the third, and Bhartṛihari of the fourth. Vikramārka became king, while Bhaṭṭi served him in the capacity of Prime-minister."

A critical survey of these several diverse opinions shows that the balance of evidence rests with those who take Bhaṭṭi to be distinct from Bhartṛihari. The three oldest scholiasts take Bhaṭṭi to be the name of the author of the Bhaṭṭi-kāvya, so does the MS. under notice, which is 478 years old. The old authors cited by Aufrecht all cite Bhaṭṭi and one of them Bhojadeva, author of the *Sarasvatī-kanthā-bharaṇa*, who lived over a thousand years ago, quotes from the works of both Bhaṭṭi and Bhartṛihari, showing clearly that in his time they were two distinct persons and not one with two names. It would not be critical to set aside their opinion on the authority of the three later Bengali scholiasts, none of whom lived at an earlier date than 250 years from this time. Colebrooke avowedly followed these later scholiasts, and does not seem to have made any careful enquiry on the subject. Professor Aufrecht's quotations should have created in him a doubt on the subject; but they did not. On the same page (175) he has given the two names without a remark. Bhau Dājī, Bohlen and Śeṣhagiri Śāstrī recognise Bhaṭṭi to be distinct from Bhartṛihari. The traditions quoted by them are at best of little worth, but they are, as far as they go, opposed to the latest scholiasts.

Nor is it difficult to make out how the confusion has arisen. Bhaṭṭa

is an honorific title, meaning a learned man or a professor, and its derivative form Bhaṭṭi is very unlike a proper name, and the latter commentators felt the necessity of searching for something to replace it. How they fell upon Bhartṛihari it is not easy to guess. It may at first sight appear that they thought that Bhaṭṭi must be a corruption of some other word, and as *Bhatti* is the vernacular form of Bhartṛi the conclusion was drawn that Bhaṭṭi stood for Bhartṛihari. This is, however, not philologically correct, inasmuch as *Bhatti*, the corruption of *Bhartṛi*, takes the dental and not the cerebral t, and Bhaṭṭi is invariably written with the cerebral and not the dental letters. To Englishmen, most of whom cannot pronounce the dental letters, this may not appear a serious objection, but to Indians the distinction is so marked that it is difficult to conceive a confusion in this respect. There must have been some other cause, but I know not what it was. There is nothing, however, to preclude the use of Bhaṭṭi as a proper name. The diminutive of Bhaṭṭa would be Bhaṭṭi, and the young son of a Bhaṭṭa may well be called by the affectionate diminutive "the little professor" or "teacherling." Indian languages abound in such affectionate epithets, and they are not unknown in Europe. By long usage such epithets stick fast, and cannot afterwards be cast off. In many instances they have absolutely set aside the names given at christening. It may be added that nick-names have often been used as proper names, and the question then naturally arises, is Bhaṭṭi the proper or the nick-name of the author, but there is nothing to decide it. It might have been the one or the other, but certain it is that it was the most popular name, and the author was best known by it.

The next question refers to the name of the author's father. The authorities quoted above give Svāmī or Śrīsvāmī, Śrīdhara Svāmī, Bhartṛihari and Chandragupta. The last two occur in apocryphical stories, and may at once be rejected as false. Jaymaṅgala is the oldest, and appears to be a very cautious and critical scholiast, and he gives the first name which may be accepted as the most authentic. Svāmī is certainly a title, but there is nothing to prevent its use as a proper name, and if we accept the Śrī which precedes it as a part of the name and not an honorific epithet, there would be nothing to object to it. It may, however, be more reasonably taken to be an abbreviation, or the use of the literary title instead of the proper name. The use of titles for proper names is by no means uncommon.

The poet at the end of his work gives a stanza in which he describes his patron who, he says, was king Śrīdhara-sena of Balabhi. The stanza runs thus:—

काव्यमिदं विहितं मया बलभ्यां श्रीधरसेननरेन्द्रपालितायां ।

कौर्त्तिरिथं भवतादौ नृपस्य सेनङ्करः क्षितिपो यतः प्रजानाम् ॥ स २९ श्लोक ३५ ॥

"May this poem, written by me in Balabhi, the protected of the great king Śrīdharasena, be to the glory of the king, since the king is the well-doer of the people."

The Balabhi here mentioned is obviously Balabhipura, the capital of the Saurāṣṭra kingdom, and we know from Wathen's copper-plates that there were three Śrīdharasenas in the Balabhi, Balahara, or Balarāis dynasty.

The first of them reigned in A. D. 319. He was followed by Silāditya I, Charagriha I, and then by a second Śrīdharasena. We have then a Dhruva-sena and then a third Śrīdhara-sena. Which of these three kings was the patron of the poet cannot be made out, but there is no reasonable doubt that one of them was; and we may, therefore, safely place the time of our poet to be the middle or end of the fourth century A. D. As regards the name of the father, the first idea suggested by this stanza is that the commentators confounded the patron with the father of the poet, but, seeing that Śrīdhara in the case of the king is followed by the epithet sena, and in the case of the father by Svāmī, it might reasonably be urged that Śrīdhara the father was distinct from the king of that name. The poet has named the king, and the scholiasts have given the name of the poet's father. Anyhow it is obvious from the epithets assigned to him, and from the way in which he refers to the king, that the poet was not a king, nor the son of a king, nor a prime-minister. He was a Brāhmaṇ poet and grammarian of Balabhipura, and had no relation whatever to Vikramārka, Chandragupta, Vararuchi or Bhartṛihari. The time usually assigned to Bhartṛihari is the 3rd century of the Christian era, whereas my deductions bring Bhaṭṭi to the middle or end of the 4th century, showing a difference of about a hundred years—a slight difference in the case of oriental literary history, and by no means such as to prevent scholiasts of the 16th or the 17th or the 18th century from easily confounding the two authors.

Dr. A. F. R. HOERNLE read the following extracts from a letter from General A. Cunningham on some of the Antiquities exhibited at previous meetings of the Society.

"The gold coin with a ring, of which an engraving is given in the Proceedings for February, is quite new to me. I should like to have read the legend as

Sri Champa Raja

but there seems to be a vowel over the first letter of the name—unless indeed it be only an ornament. Can it be *Chaidya* Raja—The Raja of Chadi?

"I read Mr. Growse's seal as *Mattila*, which is a known name; see Samudra Gupta's Allahabad Pillar inscription, line 18 of Prinsep's Plate in the Journal of the Asiatic Society of Bengal, November 1837. It is the second name in the line. The first letter cannot by any possibility be s."

Dr. HOERNLE communicated a new reading of the Arian Pāli Inscription on the so-called Sue Vihāra copperplate. He stated that this inscription had already been read, though imperfectly, by Sir E. C. Bailey and Professor Dowson, in 1870. (See J. A. S. B., vol. XXXIX, pp. 65-70, and J. R. A. S., Vol. IV, pp. 497-502.) Having recently had occasion to examine the copperplate, which forms part of the collection of this Society, he found that some of the letters had hitherto been misread. The rectification of these errors made the meaning of the inscription clear and consistent. Literally translated it is as follows: "On the 20th day of the month Daisios, in the 11th year of the great king, the Overking of kings, the son of the gods, Kanishka; On the said day, to the mendicant Nāgadatta, learned in the Sāṅkhya (philosophy), the disciple of the Āchārya Damatrātā, the disciple of the disciple of the Āchārya Bhava, putting up his staff (or pillar); here the owner of the Dāmana Vihāra, a female lay-devotee, Balanandī, (who is) much given to penances, and Balajayā, her mother, give a shrine for the staff, and the customary accessories. May it be for the health and wealth of all beings." The paper will be published in the *Indian Antiquary*.

The following papers were read:—

1. *On the Temples of Deoghar.*—By DR. RĀJENDRALĀLA MITRA, C. S. I. (Abstract.)

The paper opens with a description of Deoghar, its situation, extent and population. Then follow some extracts from the Purāṇas on the origin of the Vaidyanātha temple. The substance of the legend is that Rāvaṇa, king of Ceylon, was in the habit of daily paying a visit to a lingam on the Kailāsa mountain, but, feeling the self-imposed task too troublesome, once sought the permission of the lingam to remove it to Ceylon. The lingam assented on the condition that the removal should be effected by Rāvaṇa without a break in the journey, or a deposition of the lingam on the ground any where in the way. Rāvaṇa agreed, but when bringing it through mid-air, was obliged to hand it over to a Brāhmaṇ, who deposited it at Deoghar. The principal temples of the place are all located in a courtyard in the north-east quarter of the town. The largest and most sacred one is barely 400 years old, and was erected by one of the Rājās of Gidhor. The rest are of later dates. The presiding divinity of the principal temple is a lingam about 3½ inches high,

and 4 inches in diameter. It is held in the highest veneration, and pilgrims by thousands resort to the place from all parts of India. During the principal festivals, the number of pilgrims varies from 40 to 60 thousand. The lingam is noted for effecting miraculous cures. On the north, the south and the west sides of the temple, there are verandas, in which from 40 to 60 persons are to be daily seen lying in absolute fast for days, in the hope of the divinity disclosing to them in dreams the remedy for their ailments. Most people are blessed with the dream on the 3rd, 4th or 5th day of their fast, but those who are not so blessed even on the 7th day are generally driven away on the 8th to prevent death by starvation. Cures are frequent, particularly of nervous diseases, such as hysteria and the like.

Some of the images in the minor temples are of Buddhist origin. In one temple a figure of Padmapāpi is worshipped as Sūrya, and the image of a Bodhisattva does duty in another temple for the goddess of Dawn, Sandhyā. The author is of opinion that the place was originally the site of a Buddhist sanctuary which has been, since the expulsion of the Buddhists, appropriated to Hindu worship. The paper includes texts and translations of all the inscriptions available at the place, as also a drawing of the principal temple and a ground-plan.

This paper will be published in the Journal, Part I.

2. *On the origin of the so-called Kharakpur Meteorite.*—By V. BALL, M. A., F. G. S.

[Received 28th July; Read 3rd August, 1881.]

In the year 1848 a mass of iron supposed to be of meteoric origin, which had been found embedded in the soil on the top of the Kharakpur hills, was forwarded to the Asiatic Society. It was stated that it had been exhumed by the hillmen and had been an object of worship for many years.

Mr. Piddington, who had invited Capt. Sherwill to procure it for the Society, after a physical and chemical examination which is fully detailed in the Journal,* pronounced it to be a veritable meteoric iron. The chemical examination was believed to have revealed the presence of nickel, cobalt and chromium, which metals commonly occur in meteoric irons. The metal was stated to exhibit the damasked lines known as Wiedemannstatten figures which are specially characteristic of meteoric irons.

The result was, in short, that this mass of metal weighing nearly 156½ pounds became renowned as the Kharakpur meteorite and for many years it held a place of honour in the case of meteoric stones in the Society's Museum. About the year 1860 a sample cut from it was

sent to Dr. Haidinger in Vienna and possibly specimens were also sent to other Museums in Europe.

Dr. Haidinger* declared the iron to be of non-meteoritic origin, an opinion which was founded not only on the absence of true Wiedemann-statten figures, but also on an analysis of the metal by Herr Karl Ritter von Hauer which gave 98 per cent. of iron with a residue of silica and carbon; but no trace of either nickel or cobalt.

Recently, when writing the Chapter on Iron for the forthcoming volume on the Economic Geology of India, it occurred to me that it was necessary that the true nature of this iron should be discussed, for, if it were really native iron, it was, though not of meteoritic origin, still worthy of notice. On enquiry I found that the specimen had been removed from the meteorite cases in consequence of its having been shown to be not entitled to its place there; but it seems that its true origin has never been declared. In conjunction with several of my colleagues, I am fully satisfied that it is nothing more nor less than an abnormally large ball or bloom of iron from a native furnace. This view affords a means of explaining the origin of the foot-like portion projecting from the mass which Mr. Piddington endeavoured to explain in connection with the meteorite theory. This foot was simply produced by the impress of the base of the chimney shaft over the hearth which became filled with the iron; such a projection, which is in other words a cast of the form of the bottom of the shaft, is to be seen on the majority of blooms, which resemble in shape inverted 'button' mushrooms with a portion of the stalk remaining.

The Kharakpur iron differs from the native smelter's ordinary bloom in being somewhat larger and in being of less symmetrical shape than is usual. Its preservation and employment as an object of worship were doubtless connected with these facts. It is possible that the hearth may have been of the ordinary size but by a subsidence, due perhaps to an unobserved hollow or ant burrow in the soil underneath, it became enlarged on one side; and thus a long time elapsed after the smelting had commenced before the accumulated metal rose to the usual level at the base of the shaft, when the smelter's custom is to stop the blast, break down the front of the furnace, and pull out, hammer and cut the bloom in two. It may have been that the smelters, already alarmed by the unusual consumption of ore and fuel, were fairly frightened out of their senses when they saw the size of the bloom and thought it was the old *Bhût* himself, and at once proceeded to perform homage, which continued to be offered by their descendants till the time when the bloom was

carried off by an Indigo Planter who presented it to the Society through Capt. Sherwill.

Another simpler explanation of the cause of its having escaped the usual treatment of blooms may possibly be attributable to the fact that its large size, and the comparatively cold state of a great portion of it, rendered it impossible for the smelters to hammer it out.

That the first suggestion, however, is not an extravagant one may be gathered from the fact that recently, when in the close vicinity of the locality where this iron was obtained, I was shown an iron mine which had been deserted for the following reason. Some of the ore had been treated in the usual way, and on the smelters tapping the furnace, so the story goes, two streams, one of blood and the other of milk, flowed from it. Several deaths happened shortly after in the families of the smelters, and since that time, now twelve years ago, no more of that unlucky ore has been used in the furnaces.

As a possible explanation for the origin of the stream of milk, it may be suggested that the ore may have been partly of tin or lead, and the white metal which flowed forth may have suggested milk. The stream of blood may have been imaginary, the idea being simply added to improve the story.

3. *Second List of Rhopalocerous Lepidoptera from the Andaman Islands, with Descriptions of new or little-known Species and Varieties.*—By J. WOOD-MASON, Deputy Superintendent, Indian Museum, Calcutta, and L. DE NICÉVILLE.

(Abstract.)

Since the publication of their first list of Andamanese Butterflies, the authors have received from their active correspondent, Mr. A. R. de Roepstorff, 17 additional species, 13 of which have not been previously recorded therefrom, thus bringing up the total of species from these islands to 125.

The following are the species which are new to the islands or upon which notes are given :—

1. *Cyrestis horatius*, n. sp. Allied to *C. coeles*, which it closely resembles in the character of the markings, but from which it differs in the ground-colour of the upperside being pure white marked with different shades of sepia-brown, in having a pale fulvous patch at the anal angle of the posterior wings, and, on the underside, in having only the lightest portions of the sepia markings absent. Nine males from S. Andaman.
2. *Cyrestis thyodamas*, var. *andamanica*, nova. Differs from all continental examples in the bright fulvous, almost ferruginous, anal region of the posterior wings, &c. A large series of males from S. Andaman.
3. *Neptis jumba*, Moore.

4. *Lampides malaya*, Horsfield.
5. *Arrhopala amantes*, Hewitson.
6. *Amblypodia* (? *Narathura*) *fulla*, var. *andamanica*, nova. Has the wings above brilliant violet-cyaneous and rather more broadly bordered with black-fuscous: below, pale subochraceous-fuscous with very faint discocellular marks on both pairs and basal marks on posterior ones. Intermediate between *A. fulla*, Hewitson, from Bouru, and *A. arsenius*, Felder, from Luzon. A minute tooth-like tail to posterior wing. One male from S. Andaman.
7. *Papilio rhodifer*, Butler. Female described.
8. *Papilio lastrygonum*, W.-M. Female described.
9. *Papilio prexaspes*, Felder. Female described.
10. *Ismene malayana*, Felder. Female described.
11. *Ismene exclamationis*, Fabr.
12. *Ismene harisa*, Moore.
13. *Ismene badra*, Moore.
14. *Telegonus acroleucus*, n. sp. Anterior wings above tipped with ashy-white and bearing three large diaphanous and lustrous yellow discal spots arranged as in *T. thrax*, than which it is much smaller, &c. Numerous males from S. Andaman.
15. *Plesioneura paralysos*, n. sp. Close to *P. alysos*, but differing therefrom in its broader and less irregularly-margined white band and in having only a single small spot on anterior wings, but two on posterior wings below. Three males and a female from South Andaman. Continental specimens differ in having no trace of the white spots on the underside of the posterior wings.
16. *Plesioneura dan*, Fabr. Differences between Andaman and continental specimens pointed out.
17. *Plesioneura leucocera*, Kollar. Separable by no constant character from several other species since described from other localities.
18. *Tagiades bhagava*, Moore. Female described and notes on male given.
19. *Hesperia sala*, Hewitson. Re-described and stated to be nearest allied to *H. divodasa*, Moore.
20. *Hesperia praba*, Moore.
21. *Telegonus thyrsis*, Fabr. The secondary sexual characters of male described.

The paper, which is illustrated by a coloured plate, will be published in the Journal, Part II, No. 4 for the current year.

LIBRARY.

The following additions have been made to the Library since the meeting held in July last.

TRANSACTIONS, PROCEEDINGS AND JOURNALS,

presented by the respective Societies and Editors.

- Baltimore. American Chemical Journal, Vol. I. Nos. 1—6; Vol. II, Nos. 1—6; Vol. III, Nos. 1—3.
- . American Journal of Philology, Vol. I, Nos. 1—4; Vol. II, No. 5.
- . Register of the Johns Hopkins University, for 1880-81.
- . American Journal of Mathematics, Vol. III, Nos. 1—3.
- Berlin. K. preussische Akademie der Wissenschaften,—Monatsbericht, February 1881.
- Bombay. The Indian Antiquary,—Vol. X, Part 121, July 1881.
- Bordeaux. Société de Géographie Commerciale,—Bulletin, Nos. 12-13.
- Calcutta. Geological Survey of India,—Memoirs, Vol. XVIII, Part 1.
- . Register of Meteorological Observations for June 1880.
- Colombo. Royal Asiatic Society, Ceylon Branch,—Proceedings, 1875-80.
- . ———— Journal,—Part II, 1880; and Vol. VII, Part 1, No. 23, 1881.
- Copenhagen. Aarboger for Nordisk Oldkyndighed og Historie, Nos. 3 and 4, 1880.
- Frankfurt. Senckenbergische Naturforschende Gesellschaft,—Abhandlungen, Vol. XII, Nos. 1 and 2.
- . ————. Bericht, 1879-80.
- Florence. Archivio per l'Antropologia e la Etnologia, Vol. III, Parts 1—4; Vol. IV, Parts 1—4; Vol. V, Parts 1—4; Vol. VI, Parts 1—4; Vol. VII, Parts 1—4; Vol. VIII, Parts 1—4; Vol. IX, Parts 1—3; and Vol. X, Parts 1—3.
- Leipzig. Wissenschaftlicher Jahresbericht,—Part 1, 1878.
- . Deutsche Morgenländische Gesellschaft,—Zeitschrift, Vol. XXVI, Parts 3—4; Vol. XXXV, Part 1.
- . Abandlungen für die Kunde des Morgenlandes, Vol. I, Nos. 4—5; and Vol. VI, Nos. 1—4.
- London. Royal Astronomical Society,—Monthly Notices, Vol. XLI, No. 6, April 1881.
- . Institution of Civil Engineers,—Minutes of Proceedings, Vol. LXIII, Part 1, 1880-81.

- London. Society of Telegraph Engineers,—Journal, Vol. X, No. 36.
 ———. Institution of Mechanical Engineers,—Proceedings, No. 1, January 1881.
 ———. Anthropological Institute of Great Britain and Ireland,—Journal, Vol. X, No. 3, February 1881.
 ———. ———. List of Members, April 1881.
 ———. Statistical Society,—Journal, Vol. XLIV, Part 1, March 1881.
 ———. Royal Society,—Proceedings, Vol. XXXI, No. 211.
 ———. Zoological Society of London,—Proceedings, Part 4, 1880.
 ———. ———. Transactions,—Vol. XI, Parts 3—4.
 ———. Royal Geographical Society,—Proceedings, Vol. III, No. 6, June 1881.
 ———. Nature, Vol. XXIII, Nos. 591, 595, 598 and 600; Vol. XXIV, Nos. 601, 607—610.
 ———. The Academy, Nos. 476—479.
 ———. The Athenæum, Nos. 2799—2802.
 Lyon. Société de Géographie,—Bulletin, Vol. III, No. 20, 1880.
 Melbourne. Royal Society of Victoria,—Transactions and Proceedings, Vol. XVII.
 Munich. Repertorium für Experimental-Physik, Vol. XVII, Nos. 1—7.
 Paris. La Société de Géographie,—Bulletin, March 1881.
 ———. La Société d'Anthropologie,—Bulletin, Vol. III, Part 4, July to December 1880.
 Simla. United Service Institution of India,—Journal, Vol. X, No. 47, 1881.
 St. Petersburg. L'Académie Impériale des Sciences de St. Petersburg, —Mémoires, Vol. XXVIII, Nos. 1 and 2.
 ———. ———. Bulletin, Vol. XXVII, Nos. 1—2.
 Pisa. Società Toscana di Scienze Naturali,—Atti, Processi Verballi, 8th May, 1881.
 Turin. R. Accademie delle Scienze,—Atti, Vol. XVI, No. 5.
 ———. Osservatorio della Regia Università,—Bollettino, 1880.
 Vienna. Anthropologische Gesellschaft,—Mittheilungen, Vol. X, Nos. 10—12.
 ———. K. k. geologische Reichsanstalt,—Jahrbuch, Vol. XXXI, No. 1, January to March, 1881.
 ———. ———. Verhandlungen, Nos. 1—7, 1881.

BOOKS AND PAMPHLETS,

presented by the Authors.

- BANDOW, CHR. J. The Precedents of Princess Thoodamma Tsari. Translated with numerous explanatory notes, and a vocabulary of the Pali and difficult Burmese words in the text. Demy 8vo. Rangoon, 1881.

Indische Studien, Vol. X, Nos. 1, 2 and 3. 8vo. Leipzig, 1867-68.

GERMAN ORIENTAL SOCIETY.

Archæological Survey of India, Reports, Vols. X and XI. 8vo. Calcutta, 1881.

On the Manufacture of Iron and the Future of the Charcoal Iron Industry in India. Fcp. Allahabad.

The Indian Antiquary,—Vol. X, Part 121, July 1881.

HOME DEPARTMENT.

Institution of Mechanical Engineers. Library Catalogue, May 1881.

With Subject Index of Papers in the Proceedings, 1847-80. 8vo. London, 1881.

INSTITUTION OF MECHANICAL ENGINEERS.

Catalogus der Bibliotheek van het K. Zoölogisch Genootschap, Natura Artis Magistra, te Amsterdam. Roy. 8vo. Amsterdam, 1881.

K. ZOÖLOGISCH GENOOTSCHAP.

Annual Report of the Board of Regents of the Smithsonian Institution for the year 1879. 8vo. Washington, 1880.

SMITHSONIAN INSTITUTION.

PERIODICALS PURCHASED.

Boston. Journal of Natural History,—Vol. VI, Nos. 1—4.

Calcutta. Indian Forester,—Vol. VII, No. 1, July 1881.

———. Calcutta Review,—Vol. LXXIII, No. 145, July 1881.

———. Indian Medical Gazette,—Vol. XVI, No. 7, July 1881.

Geneva. Archives des Sciences Physiques et Naturelles,—Vol. V, Nos. 1—6.

No. 2. *Bayer*.—Reproduction artificielle de l'indigo. Voyage sur le "Challenger:" Zoologie.

No. 4. *Wartmann, M. le Prof. E.*—Recherches sur la végétation.

No. 5. *Marsh*.—Les Odontornithes, ou oiseaux fossiles à dents de l'Amérique du Nord, décrits.—*Guehn, R.*—Essais sur la transformation de la cumarine et de ses dérivés en dérivés du groupe de l'indigo. *Lunge, G.*—Détermination du soufre dans les pyrites.

No. 6. *Renewier, L.*—Congrès géologique international à Bologne: Rapport du Comité suisse sur l'unification de la nomenclature.

Göttingen. Gelehrte Anzeigen,—Nos. 25—28.

———. Nachrichten,—No. 10, 1881.

Leipzig. Annalen der Physik und Chemie,—Vol. XIII, No. 6.

———. Beiblätter,—Vol. V, No. 5

London. Nineteenth Century,—No. 52, June 1881.

———. Messenger of Mathematics,—Vol. X, No. 12, April 1881.

———. Journal of Botany,—Vol. X, No. 222, June 1881.

———. Entomologist,—Vol. XIV, No. 217, June 1881.

———. Entomologist's Monthly Magazine,—Vol. XVIII, No. 205, June

- London. *Annals and Magazine of Natural History*,—Vol. VII, No. 42, June 1881.
- . London, Edinburgh and Dublin *Philosophical Magazine*,—Vol. XI, Nos. 70—71.
- . *Journal of Science*,—Vol. III, No. 90, June 1881.
- . *Publishers' Circular*,—Vol. XLIV, Nos. 1050—51.
- . *Chemical News*,—Vol. XLIII, Nos. 1125—1126, Index; and Vol. XLIV, Nos. 1127—1128.
- . *Society of Arts*,—*Journal*, Vol. XXIX, Nos. 1490—1494.
- Paris. *Annales de Chimie et de Physique*,—Vol. XXIII, May and June 1881.
- . *Comptes Rendus*, Vol. XCII, Nos. 23—26, and Index to Vol. XCI.
- . *Revue Scientifique*, Vol. XXVII, Nos. 25—26, and Vol. XXVIII, Nos. 1—2.
- . *Revue Critique*, Vol. XI, Nos. 24—26, and Vol. XII, No. 27.
- . *Revue des deux Mondes*—Vol. XLV, No. 4; Vol. XLVI, No. 1.
- . *Journal des Savants*,—June 1881.

. BOOKS PURCHASED.

- BADGER, GEO. PERCY. *An English-Arabic Lexicon, in which the Equivalents for English Words and Idiomatic Sentences are rendered into Literary and Colloquial Arabic.* 4to. London, 1881.
- BOWERBANK, J. S. *A Monograph of the British Spongiadæ*, Vol. III. 8vo. London, 1874.
- BRADY, G. STEWARDSON. *A Monograph of the Free and Semi-Parasitic Copepoda of the British Islands*, Vols. I—III. 8vo. London, 1878—80.
- BUCKTON, GEO. BOWDLER. *Monograph of the British Aphides*, Vols. I, II and III. 8vo. 1876—81.
- St. E'tienne. *Congrès Provincial des Orientalistes Français*,—*Egyptologie*, I Bulletin, Vol. II. 8vo. Saint-E'tienne, 1880.
- DAVIDS, T. W. Rhys. *Buddhist Sutras*, translated from Pali. (F. Max Müller's "Sacred Books of the East," Vol. XI.) 8vo. Oxford, 1881.
- HEWITSON, WILLIAM C. *Exotic Butterflies*. Part 82, April 1st 1872; and Part 83, July 1st 1872. 4to. London, 1872.
- MURRAY, JAMES A. *The Plants and Drugs of Sind; being a Systematic Account with Descriptions of the Indigenous Flora, and Notices of the Value and Uses of their Products in Commerce, Medicine and the Arts.* Roy. 8vo. London and Bombay, 1881.
- SOWERBY, G. B. *Thesaurus Conchyliorum*, Parts 35 and 36. 4to. 1880.
- The Zoological Record for 1879* (Vol. XVI). 8vo. London, 1881.
- WRIGHT, Dr. WILLIAM. (Palæographical Society.) *Facsimiles of Ancient MSS.* Oriental Series, Part VI. Fol. London, 1881.

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 मनः शर्म धर्माश्चाम्भिमिनविहृषिष्यममया॥ दीपकं च कृत्वा दीप्यमानं नूनमगच्छन् कुषां रत्नमर्चयित्वा नानां विद्या
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 उन्मोक्षणाय

FACSIMILE OF THE LAST PAGE OF A MS. OF THE BHATTI-KÁVYA, DATED ŚAKA 1326.

PROCEEDINGS
OF THE
ASIATIC SOCIETY OF BENGAL.

FOR NOVEMBER, 1881.

The Monthly General Meeting of the Asiatic Society of Bengal was held on Wednesday, the 2nd November, at 9 p. m.

C. H. TAWNEY, Esq., M. A., Vice-President, in the Chair.

The minutes of the last Meeting were read and confirmed.

The following presentations were announced—

From St. Xavier's College Observatory,—Results of Observations, January to June 1881.

From the Hungarian Academy of Sciences,—(1) *Codex Cumanicus Bibliothecæ ad Templum divi Marci Venetiarum*, by Comes Géza Kuun, (2) *Nyelvelméktár. Régi Magyar Codexek és Nyomtatványok*, Vols. VII and VIII, by J. Budenz, G. Szarvas, and A. Szilády.

From the British Museum,—(1) *Catalogue of the Persian Manuscripts in the British Museum*, Vols. I and II, by Chas. Rieu, (2) *Catalogue of Oriental Coins in the British Museum*, Vol. VI, (3) *Catalogue of the Birds in the British Museum*, Vol. V, by R. B. Sharpe, (4) *Illustrations of Typical specimens of Lepidoptera Heterocera in the collection of the British Museum*, Pt. V, by A. G. Butler.

From the Editing Committee, The Norwegian North Atlantic Expedition 1876-78, Zoology, *Gephyrea*, by D. C. Danielssen, and Johan Koren.

From the Johns Hopkins University,—On the Mechanical Equivalent of Heat, with Subsidiary Researches on the Variation of the Mercurial from the Air Thermometer and on the Variation of the Specific Heat of Water, by Henry A. Rowland.

From the Home Department,—Sacred Books of the East, Vols. X and XI, edited by Max Müller.

From the Society,—Katalog der Bibliothek der deutschen Morgenländischen Gesellschaft, II.

From the Authors,—(1) On the Land Shells of the Island of Socotra collected by Professor Bayley Balfour, by Lieut.-Col. H. H. Godwin-Austen, (2) Bilingual Coins of Bukhara, by Edward Thomas.

From the Indian Museum,—Annual Report for April 1880 to March 1881.

From the Geological Survey of India,—Popular Guides to the Geological collections in the Indian Museum No. 1, Tertiary Vertebrata, by R. Lydekker, No. 2, Minerals, by F. R. Mallet, and No. 4, Palæontological Collections, by Dr. O. Feistmantel.

From the Marine Survey Department,—Return of Wrecks and Casualties in Indian waters for the year 1880, and charts of (1) Stewart's Sound, (2) Sadashivgad Bay including Port Karwar and Beitkul Cave, (3) Arabian Sea.

From J. V. Juggarrow's Observatory,—Results of Meteorological Observations, 1880.

From Lieut. R. C. Temple,—Note on two Maps of the Andaman Islands (with Maps), by E. H. Man and Lieut. R. C. Temple.

From the Meteorological Reporter to the Government of India,—Report on the Meteorology of India in 1879, 5th year.

From the Panjab Government,—(1) A complete Dictionary of the Terms used by Criminal Tribes in the Panjab together with a short History of each Tribe, and the Names and Places of Residence of individual Members, by Muhammad Abdul Ghafur, (2) Appendix—A detailed Analysis of Abdul Ghafur's Dictionary of the Terms used by Criminal Tribes in the Panjab, by Dr. G. Leitner, (3) A sketch of the Changars and of their Diacleet by Dr. G. W. Leitner.

From the Société Zoologique de France,—De la Nomenclature des Êtres Organisés.

From the Society,—Catalogue de la Bibliothèque de la Société Nationale des Sciences Naturelles et Mathématiques de Cherbourg, Pt. I, by Auguste le Jolis.

From Mr. J. de Goeje,—The History of the Almohades by Abdo'l-Wáhid al-Marrékoshí, by R. Dozy.

From the Government, N. W. P.—Notes on the Economic Products of the North-Western Provinces, Pt. V.

The SECRETARY read the following extracts from a letter from Dr. R. Mitra forwarding a presentation copy of his work entitled: "Indo-Aryans: Contributions towards the Elucidation of their Ancient and Mediæval History."

"Will you do me the favour to present the accompanying two volumes to the Asiatic Society at its next meeting? The Library of the Society afforded me the materials for my researches; the kind consideration shown me by the Society enabled me to persevere in my undertaking; and the publications of the Society provided me the means of bringing to light the fruits of my labours. I am now bringing out a new edition of my

essays, I cannot allow the opportunity to pass without expressing my grateful acknowledgments to the Society."

The **PRESIDENT** announced that, according to Rule 7, the following Gentlemen had been elected Ordinary Members of the Society by the Council during the recess :—

H. M. Percival, Esq., proposed by C. H. Tawney, Esq., seconded by A. W. Croft, Esq.

Chr. J. Bandow, Esq., proposed by Dr. A. F. R. Hoernle, seconded by Dr. H. W. M'Cann.

These elections were confirmed by the meeting.

The **SECRETARY** reported that since the last meeting in August, the following Gentlemen had intimated their desire to withdraw from the Society :—

Dr. D. B. Smith, H. K. W. Arnold, Esq., and that the elections of the following Gentlemen had been cancelled under Rule 9, as they had not paid their admission fee and first quarter's subscription :—

R. O. Lees, Esq., proposed by L. Schwendler, Esq.

Babu Peary Mohan Guha, proposed by Babu Adharlal Sen.

Babu Trailokyanath Mitra, proposed by Babu Adharlal Sen.

The following Gentleman duly proposed and seconded at the September meeting of the Council was elected an Ordinary Member :—

L. de Nicéville, Esq., proposed by H. B. Medlicott, Esq., seconded by Dr. J. Anderson.

The following Gentlemen are candidates for ballot at the next meeting :

R. Logan, Esq., proposed by Hon. H. J. Reynolds, seconded by J. Westland, Esq.

J. J. Monteath, Esq., M. D., proposed by J. Wood-Mason, Esq., seconded by Dr. D. D. Cunningham.

The **COUNCIL** reported that, in consequence of the deaths of Sir John Philippart, the Count de Noe, Professor Isaac Lea, Colonel W. Munro, and Sir J. W. Colville, there were five vacancies in the list of Honorary Members, and recommended to the Society the four following gentlemen for election as Honorary Members at the next meeting :—

Dr. William Wright, Professor of Arabic in the University of Cambridge, on account of his distinguished services to Arabic scholarship.

Dr. Rudolph v. Roth, Professor of Sanskrit in the University of Tübingen, for his services to Sanskrit scholarship, especially in co-editing the St. Petersburg Sanskrit Dictionary and the Atharva Veda Sanhita.

Sir William Thomson, Professor of Natural Philosophy in the University of Glasgow, and Hermann L. F. Helmholtz, Professor of Physics in the

University of Berlin, for their numerous and important contributions to Science, both theoretical and practical.

The COUNCIL also recommended that the remaining vacancy be left unfilled for the present.

The COUNCIL reported that the bust of the late Mr. Henry Blochmann had been received, and that a suitable pedestal had been ordered for it.

The SECRETARY announced that the following works had been sanctioned for publication in the Bibliotheca Indica, on the recommendation of the Philological Committee :—

The text of the *Lâmiyyet-el-Arab*, accompanied by two translations, one in prose and the other in verse, by C. J. Lyall, B. A., C. S.

A translation of the 2nd Volume of *Abd-ul-Kadir's Muntakhab-ul-Tawarikh*, by Rev. W. H. Lowe, M. A.

The COUNCIL reported that Mr. V. Ball had tendered his resignation as Honorary (Natural History) Secretary and Treasurer, on his departure for England, and that Mr. Wood-Mason had resumed the Natural History Secretaryship and Mr. J. Eliot had consented to act as Treasurer.

The COUNCIL recommended that, in consideration of Mr. Ball's long services to the Society, and his numerous and valuable contributions to Indian Science, he be presented with the Society's publications gratuitously for the rest of his life.

This was unanimously agreed to.

The SECRETARY read a letter from Col. J. F. Tennant, F. R. S., dated 21st October, forwarding four photographs of the *Tierra del Fuego* savages at the Bois de Boulogne, Paris, together with a short account of them in French. Owing to a famine which last year depopulated *Tierra del Fuego*, these savages were compelled to beg for food from the Captain of a German vessel, and were induced by the promise of a plentiful supply of provisions to allow themselves to be brought to Europe. Although belonging to the most degraded and ferocious of savage races, under kindly treatment they have become fairly docile, and by appealing to their love of imitation have been induced to adopt various civilized habits. For example, although the instinct of modesty is dormant within them, they have become particular about their clothes, through noticing that all the visitors to the *Jardin d'Acclimatation* are scrupulously covered from the neck to the feet. The photographs exhibited were obtained by first photographing some *employés* of the Garden, and thus inducing them out of a love of imitation to submit to the same process. So also, after some of the *employés* had been vaccinated in their presence, they complacently submitted to the same operation.

At first they satisfied their thirst by plunging their faces into water and drinking like cattle: but they have now learned to drink out of a glass or from a tap. They have made no improvement, however, in the matter of food, which is principally flesh-meat either eaten raw or rudely cooked by placing it for a few minutes on hot cinders. When coins were first presented to them by visitors, they mistook them for food and tried to eat them: on finding out their mistake, they threw them away in disgust. They refuse to sleep on anything but a rude bed of straw, which they take no trouble to renew. They remain generally quite silent, rarely speak to one another, and then only in a low voice, and only show any vivacity of expression when they are eating their meals.

COL. TENNANT says of these photographs—

"Low as their intellect is said to be, I do not think that the photographs show any great want of natural intelligence, and in this respect they agree with my own impression. Indeed, I think they are not unfair likenesses of the people."

The SECRETARY read the following letter from Mr. J. B. N. Hennessey, F. R. S., Deputy Superintendent, Survey of India, on an outburst of sun-spots observed at Dehra Dun:—

"The following particulars of an outburst of sun-spots may be of interest to the Society not only on account of the magnitude of the occurrence but because the time of the event is known within *small* limits.

"I premise briefly, that a Photoheliograph is in daily use at the office of the Trigonometrical Branch Survey of India, Dehra Dun, of which I have executive charge. At present the instrument yields only 4-inch pictures. At least two negatives are taken daily of the sun when visible.

"On the 25th July 1881, the earliest negative obtained was at 3h. 58m. P. M. (Local Apparent Time): it exhibited several sun-spots as is now usual and of which therefore little need be said, for it is no doubt known to the Society that the sun for some months past has resumed a state of considerable energy in respect to development of features: this negative for the sake of distinction may be understood by N_1 . The second negative or N_2 was taken at 4h. 47m. P. M. On comparing N_1 and N_2 , it was at once seen that in the interval of 49m. a considerable group of spots had appeared in the neighbourhood of the sun's centre. It is difficult to reproduce with fidelity such features from so small a negative even by means of a silver print. I, however, enclose a hand-tracing of the negative N_2 (Plate III), in which the new group of spots is shown in red, so that the position of the group may be nearly inferred.

"This new group consists of 16 spots of which no individual spot is notably large, but there is this peculiarity about them all that they exhibit hardly any penumbra but consist almost entirely of well defined umbra:

what penumbra appears is confined chiefly to two spots, where it is seen only to the S. E.

"As to magnitude, the spots are scattered over an area of some 6000 millions of square miles, while the collective area of the spots themselves is about 630 millions of square miles, or, say, 6 times the area presented by the earth to a distant spectator.

"Unhappily the sun remained invisible till the 30th July, when two negatives were taken, *i. e.*, after an interval of just 5 days; so far as solar rotation could effect, the so-called new group of N_2 should have been visible not far from the sun's western edge; but the entire group had vanished leaving no trace behind. In the interim of 5 days, 2 new spots had come out; of *one* of these I may add that the umbra is about 200 millions of square miles and the penumbra some 700 millions, presenting in all a single feature of more than 900 millions square miles, or say 9 times the area exhibited by the earth to a distant spectator.

"It will be seen from the foregoing that a considerable group of sun-spots burst into view about the centre of the sun on 25th July 1881 between the hours of 8h. 58m. P. M. and 4h. 47m. P. M. local apparent time, Dehra Dun."

DR. M'CANN drew the attention of the Society to some letters which had appeared in "Nature" from Professor Piazzzi Smyth, which were of interest in connection with the outburst of sun-spots observed by Mr. Hennessey. It appears that on January 26th of this year, a most peculiar series of clouds formed in the upper regions of the atmosphere above Madeira. These clouds resembled closely the appearances observed in vacuum-tubes through which electrical discharges are passing: and Professor Smyth attributes their formation to the passage of electrical discharges from the earth through the upper rarefied regions of the atmosphere. Professor Smyth, who had an observatory fitted up at Madeira, found that, simultaneously with this extraordinary cloud phenomenon, there was a sudden outburst of sun-spots in the centre of the sun's disc. A month afterwards, on July 26th, a precisely similar series of clouds was formed over Madeira. From its exact resemblance to that of June 26th, Professor Smyth formed the opinion that there would probably be a similar outburst of sun-spots: but, as his observatory was by this time dismantled, he was unable to verify this inference. Now, however, Mr. Hennessey's independent observation at Dehra Dun shows that Professor Smyth's inference was correct, and that in this case also the appearance of the electrical cloud was immediately preceded by a sudden outburst of sun-spots, indicating a sudden increase of solar activity.

The SECRETARY read a communication from the Under-Secretary to the Government of Bengal, Judicial Department, giving some particulars of the tenets, habits, customs, and places of residence of the sect of Hindu

dissenters called "Kumbhupatias," who recently made an attack on the Temple of Jaggannath in Puri, with the object of burning the idol of Jaggannath, during which one of them was killed. The Chief Commissioner of the Central Provinces gives the following account of the sect.

"There is a peculiar sect of Hindu dissenters in the Sambulpore district, known as Kumbhupatias. The word Kumbhupatia is derived from 'kumbhu,' the name of a kind of tree, and 'pat,' the bark of a tree, and the sect is so called because its followers make ropes from the bark of the tree and wear them round their waists. The religion is also known as that of *Alekh*, and its followers claim revelation as its foundation. Alekhsamy, the god incarnate, used, it is said, to reside in the Himalayas, but about the year 1864 he came to Malbaharpore in Banki, zillah Cuttack, and revealed the religion professed by the Kumbhupatias to 64 persons, the principal of whom was Govind Dass; and it is chiefly owing to the exertions of these disciples that the religion was propagated. Alekhsamy (which signifies 'the lord whose attributes cannot be described in writing') removed to Dhenkanal, a feudatory State in Cuttack, where, for three years immediately preceding his death, he led the life of a mendicant and wanderer. Although the religion originated in Cuttack, it spread more rapidly in the district of Sambulpore, and men of all classes and castes, except the Uriya Brahmans, are freely embracing it. It is not so much the peculiarity of the rules of any particular caste or sect that tends to increase the number of converts to it as the position in life of the converts themselves: thus in Khinda the people of a whole village embraced the Kumbhupatia religion because the Gaontia had done so. The names of some thirty villages are given as those in which the Kumbhupatias chiefly reside.

"There are three sects of Kumbhupatias—(1) the Kumbhupatias proper, who wear ropes made of the bark of trees; (2) the Kanapatias, who wear rags; and (3) the Ashritas or Grosthes, who lead a family life. The first two sects renounce the world and make no distinction of caste. They eat food given by people of any caste, except by a Raja, who is supposed to accumulate his wealth by oppressing and torturing his subjects; by a Bráhmaṇ or *bhandari*, because he accepts gifts made in *shradh* ceremonies; by a washerman, because he washes the clothes of all classes of people; and by a *hadi*, because his occupation is filthy. The third sect do not renounce the world nor deem celibacy essential, nor are they turned out of caste. They look up to the other two sects as their '*gurus*' or spiritual guides, and follow their religion. They bathe in the early morning.

"Each sect has a separate temple or place of prayer. They believe in one Supreme Being, who is called Alekh; truthfulness, obedience to spiritual guidance, and faith are the principal tenets of their religion. They believe in the existence of the thirty-three crores of Hindu gods and god-

desses, but they do not respect their images, as they argue that it is impossible to represent the form of the Supreme Being, whom no one has ever seen, nor do they worship the Hindu gods and goddesses; there is indeed reason to think that, unlike the followers of Ramanand, Kabir, and Chaitanya, they have an antipathy to them, as they dislike to touch the *tulsi* plant, because it is held sacred by the Hindus, and will not eat the flesh of a goat, because it is offered in sacrifice to the Hindu goddess Kali. They eat and drink only in the daytime; if they feel hungry or thirsty at night they can drink water only. They pray in the open air every day (morning and evening) with their faces turned towards the sun, and with their hands folded and held at the nose. If four or more persons join in the prayer, one of them recites, in humble words and suppliant voice, the praises of the Almighty, the others repeating the words after him. They bow down, prostrating themselves to the ground, 64 times, corresponding to the number of disciples of their god. Their habits are very filthy. They take no medicine, but rely on the help of their god alone for recovery: in case of severe illness, they take a little earth from the prayer-ground, mix it with rice-water, and drink the mixture. During the past two years the Kumbhupatias have divided into two sections. Formerly Bhima Kondh of Sonapore was the leader of the sect. Bhima was born blind, but he appears to have been endowed with natural talents of a superior order. Though unable to read and write, he had some Uriya religious books, such as the Mahabharat and Srimat Bhagbat, read to him; and the education he thus received enabled him to compose two or three volumes of verses in praise of the Almighty, which, it asserted, would do credit to any Uriya scholar of the present day. He exercised great influence over his followers. The relations existing between him and a female companion, however, excited suspicion among his adherents, who, however, did not venture to question the purity of his conduct until the woman became pregnant. Bhima endeavoured to deceive his followers by telling them that the woman would give birth to Arjun, who would root out all unbelievers. They believed this story, and waited until the child was born, when, to their great surprise, they found that the woman gave birth to a girl. Bhima accounted for this by saying that it had recently been revealed to him that the woman would give birth to a female, who would destroy all the unbelievers by means of her charms. The child, however, died a few days later, and Bhima then tried to mislead his followers still further by saying that the fairy had quitted this world because she had found it filled with the vices of mankind. He was now deserted by most of his followers, who formed a separate faction, but he is still highly adored and honoured by the remainder. He has erected an altar, over which he and his wife sit in the morning. His followers worship them and move round the altar until the time for their morning meal arrives, when their feet are washed

with milk, which is afterwards drunk by their adherents. Another cause of dissension was because Bhima pretended that he himself was their god.

"The Kumbhupatias who made a crusade against Jaggannath were residents of Chunderpore. Dasa Ram, the leader of the party which proceeded to Puri, and who was killed in the scuffle at the temple, thought that, if Jaggannath were burnt, it would convince the Hindus of the futility of their religion, and that the whole world would thereby embrace the true religion. This account is given by some of the Kumbhupatias who reside in Sambulpore; and it is not improbable that the man was actuated by dreams, in which the Kumbhupatias firmly believe. If any member of the fraternity breaks any of the rules, speaks an untruth, or commits a crime, he is excommunicated. A man undergoes an examination before he is admitted into the sect. It is stated that the tehsildar of Ungul in Cuttack has been successful in reducing crime within his jurisdiction by encouraging a criminal class called "Pans" to embrace the Kumbhupatia religion."

The PHILOLOGICAL SECRETARY read a Memorandum on some coins by Mr. T. A. M. Gennoe, with notes by General A. Cunningham and Dr. Rájendralála Mitra.

These coins were five in number, but in the opinion of General A. Cunningham and Dr. Hoernle only two of them were genuine: and these are already noticed in Marsden's *Oriental Coins*, pp. 735 ff. and, according to General Cunningham, can be procured readily in every large town in Northern India.

The following papers were read—

1. *On a Silver coin of Shams-ud-din Kaimurs.*—By J. G. DELMERICK.
With a note by GENERAL A. CUNNINGHAM.

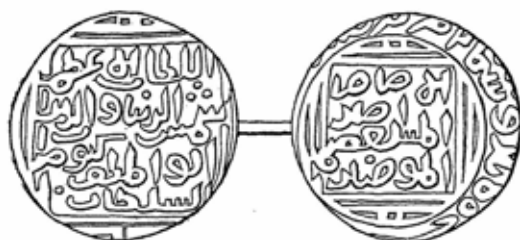
Mr. DELMERICK says:

"After the murder of Muíz-ud-din Kaikobad on the 18th Shawwal A. H. 689 (October A. D. 1290), Jallal-ud-din Firoz, in order to gratify the people and silence the opposition of the army, having obtained possession of the murdered king's only child, an infant of three years of age, placed him upon the throne, and caused the Khutba to be read and coins to be struck in the name of Shams-ud-din Kaimurs, but a few days afterwards Firoz sent this child to follow his father Kaikobad, and Firoz himself ascended the throne of Delhi on Friday the 25th Zilhijja (December) of the same year.

"Ferishtah says that Jallal-ud-din Firoz was guilty of no further acts of cruelty after the death of the young prince, but became distinguished for his humanity and benevolence.

"A coin of this unfortunate child, struck during his nominal reign, exists at Delhi and is in the possession of Pandit Rattan Narain, Názir of the Deputy Commissioner's Court.

"I subjoin a drawing and description of it—



Silver. Weight 167 grains. Unique A. H. 6

.Square areas.

الإمام
المستعصم أمير
المومنين

السلطان الأعظم
شمس الدنيا والدين
أبو المظفر كيخسرو

Margin ضرب عدد * * * * * وستمائة

GENERAL CUNNINGHAM writes:

"I have seen this silver coin of *Shams-ud-din Kaimurs* in the possession of Pandit Ratan Nārāyan. It is genuine and unique. This young Prince is mentioned by Zia-ud-din Barui by his title only: see Elliot's *Muhammadian Historians*, III, 133, 'The Sultan's child was seated on the throne, under the title of Sultān Shams-ud-din.' * * 'The sons of Jalāl-ud-din went publicly at the head of 500 horse to the royal palace, seized upon the infant Sultān, and carried him off to their father.' Ferishta notes that Jalāl-ud-din, after he had been proclaimed king 'caused the young Prince to be put to death.'"

2. *On Relics from Ancient Persia in gold, silver and copper.*—By

GENERAL A. CUNNINGHAM, C. S. I., C. I. E.

(Abstract.)

In the year 1877, on the north bank of the Oxus, near the town of Takht-i-Kuwát, opposite Khulm and two days' journey from Kunduz, there was found a large treasure of gold and silver figures, ornaments and coins, most of which have been brought to India for sale. This paper gives a description of most of the articles found, and is illustrated with 9 plates. The coins, so far as General Cunningham has seen them, range over a period of about 300 years, from the time of Darius to that of Antiochus the Great and Euthydemus of Bactria. The gold and silver figures

also seem to belong to different ages, as some are decidedly archaic, more especially a small statuette of a king in silver which the author of the paper thinks may be as old as the time of Darius.

This paper will be published in full, with plates, in the Journal Pt. I, No. 3, for 1881.

3. *The Bon (Pon) Religion.*—By BABOO SARAT CHANDRA DÁS,
Deputy Inspector of Schools, Darjiling.

(Abstract.)

This paper is a literal translation of the 8th and 11th portions of the well-known Tibetan work, *Dub-thaḥ Selkyi Melong*, written by the Lama *Je-tsun-lossang Chhoikyī Nyima pal Ssangpo* about 1740 A. D. It contains a brief account of the history, sacred books, doctrines and ceremonies of the Bon religion, which anciently prevailed in Tibet, before the introduction of Buddhism. Three periods of the Bon religion are distinguished, called the Jola Bon, the Khyar Bon and the Gyur Bon respectively. During the Jola period, it appears to have been a kind of simple Shamaism; in the Khyar period, it was mixed up with the Saiva doctrine of the Tirthikas; in the Gyur period, it was largely assimilated to Buddhism, which had been introduced into Tibet in the meantime.

This paper will be published in full in the Journal, Pt. I, No. 3, for 1881.

4. *The Early History of Tibet*—By BABOO SARAT CHANDRA DÁS,
Deputy Inspector of Schools, Darjiling.

(Abstract.)

This paper contains an account of the earlier history of Tibet, compiled from original sources, such as the Debther-ngon-po, Chhojung, Ga-nag-gi-tsi, Ngong-gyi-yig-tshang-nying-pa, etc. It is divided into two Parts. The first part narrates the earliest history of Tibet, from 416 B. C. to 917 A. D. The second part relates its history in the Middle Ages, from 917 to 1645 A. D.

This paper will be published in full in the Journal, Pt. I, No. 3, for 1881.

LIBRARY.

The following additions have been made to the Library since the Meeting held in August last.

TRANSACTIONS, PROCEEDINGS AND JOURNALS,

presented by the respective Societies and Editors.

- Baltimore. American Journal of Mathematics,—Vol. III, No. 4.
 ———. American Journal of Philology,—Vol. II, No. 6.
 Batavia. Natuurkundig Tijdschrift voor Nederlandsch-Indië, Vol. XL.
 ———. Tijdschrift voor Indische Taal-, Land-en Volkenkunde,—Vol. XXVI, Nos. 2-6, Vol. XXVII, No. 1.
 ———. Bataviaasch Genootschap van Kunsten en Wetenschappen,—Notulen, Vol. XVIII, Nos. 1-4, 1880; Vol. XIX, Nos. 1-2, 1881.
 ———. ———. Verhandelingen,—Vol. XLI, No. 2.
 Berlin. K. preussische Akademie der Wissenschaften,—Monatsbericht, March, April and May 1881.
 Bombay. The Indian Antiquary,—Vol. X, Pts. 123-125, August-October 1881.
 ———. Bombay Branch, Royal Asiatic Society,—Journal, Vol. XV, No. 39, 1881, and Index to Vol. XIV, 1878-80.
 Bordeaux. Société de Géographie Commerciale,—Bulletin, Nos. 14-20.
 Budapest. Royal Hungarian Academy,—Ervkönyvei, Vol. XVI, No. 6.
 ———. ———. Ertesítője Nos. 7-8, 1879; and Nos. 1-8, 1881.
 ———. ———. Ertekezések,—Vol. VIII, Nos. 5-10, 1879; Vol. IX, Nos. 1-2, 1880.
 ———. ———. Régi Magyar Költők Tára,—Vols. II and III, 1880-81.
 ———. ———. Literarische Berichte aus Ungarn,—Vol. IV, 1-4, 1880.
 ———. Ungarische Revue, Parts 1-4, 1881.
 ———. ———. Nyelvtudományi Közlemények,—Vol. XV, Part 3; Vol. XVI, Part 1.
 ———. ———. Almanach, 1881.
 Calcutta. Geological Survey of India,—Memoirs, Vol. XVIII, Part 3.
 ———. ———. Memoirs, Palæontologia Indica,—Series II, XI and XII, Vol. III, conclusion of Pt. 2; Series XIII, Vol. I, Part 3.
 ———. Original Meteorological Observations,—July-October 1881.
 Cherbourg. Société Nationale des Sciences Naturelles et Mathématiques,—Mémoires, Vol. XXII.

Dublin. Royal Irish Academy,—Proceedings (Polite Literature and Antiquities), Vol. II, Ser. II, No. 2, December 1880: and (Science), Vol. III, Ser. II, Nos. 5 and 6, December 1880 and April 1881.

———. Transactions (Polite Literature and Antiquities), Vol. XXVII, June 1881: and (Science), Vol. XXVIII, Parts 1-4 December 1880, February and March 1881.

Geneva. Museo Civico di Storia Naturale,—Annali, Vol. XVII.

Leipzig. Deutsche morgenländische Gesellschaft,—Abhandlungen für die Kunde des Morgenlandes, Vol. VII, No. 4.

Lisbon. Sociedade de Geographia,—Boletim, Second Series, No. 5.

Liverpool. Literary and Philosophical Society of Liverpool,—Proceedings, Vols. XXXIII and XXXIV.

London. The Academy,—Nos. 480-493.

———. The Athenæum,—Nos. 2803-2816.

———. Geological Society,—Quarterly Journal, Vol. XXXVIII, Parts 2-3.

———. Institution of Civil Engineers,—Minutes of Proceedings, Vols. LXIV and LXV.

———. Charter, By-Laws and Regulations, and List of Members, August 1st 1881.

———. Institution of Mechanical Engineers,—Proceedings, No. 2, April 1881.

———. Nature,—Vol. XXIV, Nos. 606, 611-617 and 619-624.

———. Royal Society,—Proceedings, Vol. XXXII, Nos. 212, 213, and 214.

No. 212. *Ferrier, David, and Yeo, G. F.*—The functional relations of the Motor Roots of the Brachial and Lumbo-Sacral Plexuses.

———. Philosophical Transactions,—Vol. CLXXI, Parts 2-3; Vol. CLXXII, Part 1.

———. List of Members,—30th Nov. 1881.

———. Royal Astronomical Society,—Monthly Notices, Vol. XLI, Nos. 7-8, May and June 1881.

———. Royal Asiatic Society,—Journal, Vol. XIII, Part 3.

———. Royal Geographical Society,—Proceedings, Vol. III, Nos. 7-8, July and August, 1881.

———. Royal Microscopical Society,—Journal, Vol. I (New Series), Parts 3-4.

———. Statistical Society,—Journal, Vol. XLIV, Part 2, June 1881.

———. Society of Telegraph Engineers,—Journal, Vol. X, No. 37.

———. Zoological Society,—Transactions, Vol. XI, Part 5.

———. Proceedings,—Parts 1-2, 1881.

Lyon. Société d'Agriculture,—Annales, Vol. II, 1879.

———. Société de Géographie,—Bulletin, Vol. IV, No. 21, 1881.

- Madras. Journal of Literature and Science for 1880.
- Moscow. Société Impériale des Naturalistes,—Bulletin, Nos. 3-4, 1880.
- Mozambique. Sociedade de Geographia,—Boletim, Nos. 1-4, June to September, 1881.
- Munich. Repertorium für Experimental-Physik,—Vol. XVII, Nos. 8-10.
- New Haven. American Oriental Society,—Journal, Vol. XII.
 ———. ———. Proceedings,—May 1881.
- Paris. Société Zoologique de France,—Bulletin, Parts 1-2, January to April, 1881.
 ———. Société d'Anthropologie,—Bulletin, Vol. IV, Part 1, January to February, 1881.
- Prague. Astronomische magnetische und meteorologische Beobachtungen, 1880.
- Rome. Società degli Spettroscopisti Italiani,—Memorie, Vol. X, Nos. 5-8, May to August, 1881.
- Roorkee. Professional Papers on Indian Engineering,—Vol. X, Nos. 41 and 41a.
- San Francisco. California Academy of Sciences,—Proceedings for June, 1881.
- Shanghai. North-China Branch of the Royal Asiatic Society,—Journal, No. 15, 1880.
- Stockholm. Kongliga Svenska Vetenskaps-Akademiens,—Handlingar, Vol. XIV, Pt. 2, 1876; Vol. XV, 1877; Vol. XVI, 1878; Vol. XVII, 1879.
 ———. ———. Meteorologiska Iakttagelser,—Vol. III, 1875; Vol. IV, 1876; Vol. V, 1877.
- Stuttgart. Verein für vaterländische Naturkunde,—Jahreshefte, 1881.
- Turin. Reale Accademia delle Scienze,—Memorie, Vols. XXXII and XXXIII.
 ———. ———. Atti,—Vol. XV, Nos. 1-8; Vol. XVI, No. 6.
 ———. Osservatorio della Regia Università,—Bollettino, 1879.
- Vienna. K. k. zoologisch-botanische Gesellschaft,—Verhandlungen, Vol. XXX, 1880.
- Washington. Smithsonian Miscellaneous Collections,—Vols. XVIII-XXI.
 ———. Smithsonian Contributions to Knowledge,—Vol. XXIII.
- Yokohama. Deutsche Gesellschaft für Natur-und Völkerkunde Ostasiens,—Mittheilungen, Heft XXIV, July 1881.
 ———. Asiatic Society of Japan,—Transactions, Vol. IX, Part 2.
- Zagreb. Arkeologickoga Društva,—Viestnik, Vol. III, No. 3, 1881.

BOOKS AND PAMPHLETS,

presented by the Authors.

- GODWIN-AUSTEN, LT.-COL. H. H. On the Land shells of the Island of Socotra collected by Professor Bayley Balfour. 8vo. London, 1881. Pam.
- MAN, E. H., and TEMPLE, LIEUT. R. C. Note on two Maps of the Andaman Islands. 8vo. London, 1881. Pam.
- MITRA, DR. RAJENDRALALA. Indo-Aryans: Contributions towards the Elucidation of their Ancient and Mediæval History. 2 Vols. 8vo. Calcutta, 1881.
- THOMAS, EDWARD. Bilingual Coins of Bukhara. 8vo., London, 1881, Pam.

MISCELLANEOUS PRESENTATIONS.

- Report of the Rent Law Commission, Vols. I and II. Fcp. Calcutta, 1881.
- Report on the Legal Affairs of the Bengal Government for the year 1880-81. Fcp. Calcutta, 1881.
- Administration Report of the Meteorological Reporter to the Government of Bengal for the year 1880-81. Fcp. Calcutta, 1881.
- Report on the Police of the Lower Provinces of the Bengal Presidency for the year 1880. Fcp. Calcutta, 1881.
- Report on the Law Revenue Administration of the Lower Provinces for the Official year 1880-81. Fcp. Calcutta, 1881.
- Report on Vaccination in the Province of Bengal for 1880-81. Fcp. Calcutta, 1881.
- Report on the Administration of the Salt Department for the year 1880-81. Fcp. Calcutta, 1881.
- Report on the Administration of the Registration Department in Bengal for the year 1880-81. Fcp. Calcutta, 1881.
- Supplement to the Report on Charitable Dispensaries under the Government of Bengal for the year 1880. Fcp. Calcutta, 1881.
- Records of the Geological Survey of India,—Vol. XIV, No. 3, 1881.

BENGAL GOVERNMENT.

- Magnetical and Meteorological Observations made at the Government Observatory, Bombay, 1871-78, 4to. Bombay, 1881.

BOMBAY GOVERNMENT.

- RIEU, CHARLES. Catalogue of the Persian Manuscripts in the British Museum. Vols. I-II. 4to. London, 1879-81.
- Catalogue of Oriental Coins in the British Museum. Vol. VI. 8vo. London, 1881.

Catalogue of the Birds in the British Museum. Vol. V. 8vo. London, 1881.
 Illustrations of Typical Specimens of Lepidoptera Heterocera in the collection of the British Museum. Part V. 4to. London, 1881.

BRITISH MUSEUM.

Annual Report of the Sanitary Commissioner of the Central Provinces for the year 1880. Fcp. Nagpur, 1881.

Report on the Vaccine Operations in the Central Provinces for 1880-81. Fcp. Nagpur, 1881.

Report on the Administration of the Central Provinces for the year 1880-81. 8vo. Nagpur, 1881.

CHIEF COMMISSIONER, CENTRAL PROVINCES.

DANIELSSEN, D. C., and KOREN, JORAN. The Norwegian North Atlantic Expedition, 1876-78. Zoology:—Gephyrea. 4to. Christiana, 1881.

THE EDITING COMMITTEE.

Administration Report of the Government Central Museum for the year 1880-81. Fcp. Madras, 1881.

GOVERNMENT CENTRAL MUSEUM, MADRAS.

Notes on the Economic Products of the North-Western Provinces. Part V. 4to. Allahabad, 1881.

GOVERNMENT, N. W. P.

Popular Guide to the Geological collections in the Indian Museum, Calcutta. No. 1:—Tertiary Vertebrate Animals, by R. Lydekker. No. 2:—Minerals, by F. R. Mallet. No. 4:—Palæontological Collections, by Dr. O. Feistmantel. 8vo. Calcutta, 1879-81. Pam.

GEOLOGICAL SURVEY OF INDIA.

Review of the Forest Administration in the several Provinces under the Government of India, for the year 1879-80. Fcp. Simla, 1881.

MUELLER, MAX. Sacred Books of the East. Vols. X and XI. 8vo. Oxford, 1881.

The Indian Antiquary,—Vol. X, Parts 122-124, August to October, 1881.

Records of the Geological Survey of India,—Vol. XIV, Part 3, 1881.

HOME DEPARTMENT.

KUUN, COMES GE'ZA. Codex Cumanicus Bibliothecæ ad Templum divi Marci Venetiarum. Roy. 8vo. Buda-Pestini, 1880.

BUDENZ, J., SZARVAS, G., and SZILADY, A. Nyelvemléktár. Régi Magyar Codexek és Nyomtatványok. Vols. VII and VIII. 8vo. Buda Pest, 1881.

HUNGARIAN ACADEMY OF SCIENCES.

Indian Museum: Annual Report, List of Accessions, and selected Extracts of Minutes. April 1880 to March 1881, Vol. XII. Calcutta, 1881.

INDIAN MUSEUM.

ROWLAND, HENRY A. On the Mechanical Equivalent of Heat, with subsidiary researches on the variation of the mercurial from the air thermometer and on the variation of the specific heat of water. 8vo. Cambridge, 1880.

JOHNS HOPKINS UNIVERSITY.

DOZY, R. The History of the Almohades by Abdo-'l-Wáhid al-Marréko-shí. 2nd Edition. 8vo. Leyden, 1881.

MON. J. DE GOEJE.

Report on Public Instruction in the Madras Presidency for the year 1879-80. 8vo. Madras, 1880.

MADRAS GOVERNMENT.

Return of Wrecks and Casualties in Indian Waters for the year 1880. Fcp. Calcutta, 1881.

MARINE SURVEY DEPARTMENT.

Report on the Meteorology of India in 1879, 5th year. 4to. Calcutta, 1881.

Report on the Administration of the Meteorological Department of the Government of India in 1880-81. 4to. Calcutta, 1881.

METEOR. REPORTER TO THE GOVERNMENT OF INDIA.

GHAFFUR, MUHAMMAD ABDUL. A complete Dictionary of the Terms used by Criminal Tribes in the Panjab, together with a short History of each Tribe, and the names and places of residences of individual members. 8vo. Lahore, 1879.

LEITNER, DR. G. W. Appendix. A detailed Analysis of Abdul Ghafur's Dictionary of the terms used by Criminal Tribes in the Panjab. Fcp. Lahore, 1880.

———. A sketch of the Changars and of their Dialect. Fcp. Lahore, 1880.

PUNJAB GOVERNMENT.

Results of Observations, January-June 1881.

ST. XAVIER'S COLLEGE OBSERVATORY.

De la Nomenclature des Êtres Organisés. 8vo. Paris, 1881.

SOCIÉTÉ ZOOLOGIQUE DE FRANCE.

G. V. Juggarow's Observatory, Daba Gardens, Vizagapatam. Results of Meteorological Observations, 1880. 8vo. Madras, 1881.

THE OBSERVATORY.

JOLIS, AUGUSTE LE. Catalogue de la Bibliothèque de la Société Nationale des Sciences Naturelles et Mathématiques de Cherbourg. Pt. I. 8vo. Cherbourg, 1881.

THE SOCIETY.

Katalog der Bibliothek der deutschen morgenländischen Gesellschaft, II. 8vo. Leipzig, 1881.

THE SOCIETY.

PERIODICALS PURCHASED.

- Benares. Fallon's New English-Hindustani Dictionary,—Parts IV and V.
- Bombay. The Indian Antiquary,—Vol. X, Part 125, November 1881.
- Boston. Society of Natural History,—Proceedings, Vols. X and XI.
- Calcutta. Calcutta Review,—Vol. LXXIII, No. 146, October 1881.
- . Indian Medical Gazette,—Vol. XVI, Nos. 8-10, August to October, 1881.
- Edinburgh. Edinburgh Review,—No. 315, July 1881.
- Geneva. Archives des Sciences Physiques et Naturelles,—Vol. VI, Nos. 7-9.
- Giessen. Jahresbericht über die Fortschritte der Chemie,—Part 1, 1880.
- Göttingen. Gelehrte Anzeigen,—Nos. 29-40.
- . Nachrichten,—Nos. 11-13.
- Leipzig. Annalen der Physik und Chemie,—Vol. XIII, Nos. 3-4; Vol. XIV, No. 1.
- . ———. Beiblätter,—Vol. V, Nos. 6-9.
- . Botanisches Centralblatt,—Vol. V, Nos. 1-13; Vol. VI, Nos. 1-13; Vol. VII, Nos. 1-7.
- . Literarisches Centralblatt,—Nos. 1-34, January to August, 1881.
- London. Nineteenth Century,—Nos. 53-54, July and August, 1881.
- . Messenger of Mathematics,—Vol. XI, Nos. 1-3.
- . Journal of Botany,—Vol. X, Nos. 223-224, July and August, 1881.
- . Entomologist,—Vol. XIV, Nos. 218-219, July and August, 1881.
- . Entomologist's Monthly Magazine,—Vol. XVIII, Nos. 206-207, July and August, 1881.
- . Annals and Magazine of Natural History,—Vol. VIII, Nos. 43-44, July and August, 1881.
- . London, Edinburgh and Dublin Philosophical Magazine,—Vol. XII, Nos. 72-73, July and August, 1881.
- . Journal of Science,—Vol. III, Nos. 91-92, July and August, 1881.
- . Publishers' Circular,—Vol. XLIV, Nos. 1052-1057.
- . Chemical News,—Vol. XLIV, Nos. 1129-1142.
- . Society of Arts,—Journal, Vol. XXIX, Nos. 1495-1508.
- . The Ibis,—Vol. V, No. 19, July 1881.
- . Journal of Conchology,—Vol. III, No. 6, April 1881.
- . Mind,—No. 23, July 1881.
- . Numismatic Chronicle,—Vol. I, Part 1, 1881.
- . Quarterly Journal of Microscopical Science,—Vol. XXI, No. 83, July 1881.

London. Quarterly Journal of Pure and Applied Mathematics,—Vol. XVIII, No. 69, June 1881.

———. Quarterly Review,—No. 303, July 1881.

New Haven. American Journal of Science,—Vol. XXI, Nos. 125-126, May and June, 1881; Vol. XXII, Nos. 127-128, July and August, 1881.

Paris. Annales de Chimie et de Physique,—Vol. XXIII, July and August, 1881; Vol. XXIV, September and October, 1881.

———. Journal Asiatique,—Vol. XVII, No. 3, April to June 1881.

———. Comptes Rendus,—Vol. XCIII, Nos. 1-14.

———. Revue Scientifique,—Vol. XXVIII, Nos. 3-16.

———. Revue Critique,—Vol. XI, No. 23, and Index; Vol. XII, Nos. 28-41.

———. Revue des deux Mondes,—Vol. XLVI, Nos. 2-4; Vol. XLVII, Nos. 1-2.

———. Revue de Linguistique,—Vol. XIV, No. 3.

———. Journal des Savants,—July to August, 1881.

Philadelphia. Tryon's Manual of Conchology,—Vol. III, Part 11.

BOOKS PURCHASED.

A Dictionary of the Panjabi Language, prepared by a Committee of the Lodiana Mission. 4to. Lodiana, 1854.

BALFOUR, FRANCIS M. A Treatise on Comparative Embryology. Vol. II. 8vo. London, 1881.

EDWARDS, H. MILNE. Leçons sur la Physiologie et l'Anatomie Comparée de l'Homme et des Animaux. Vols. X-XIV. 8vo. Paris, 1874-81.

EDALJI, SHÁPURJI. A Dictionary, Gujarátí and English. 8vo. Bombay, 1868.

FERGUSSON, JAMES. Tree and Serpent Worship, or Illustrations of Mythology and Art in India in the First and Fourth Centuries after Christ. From the Sculptures of the Buddhist Topes at Sanchi and Amravati. Second Edition. 4to. London, 1873.

HOUZEAU, J. C., and LANCASTER, A. Bibliographie Générale de l'Astronomie. Vol. II, Fasc. 3. 8vo. Bruxelles, 1881.

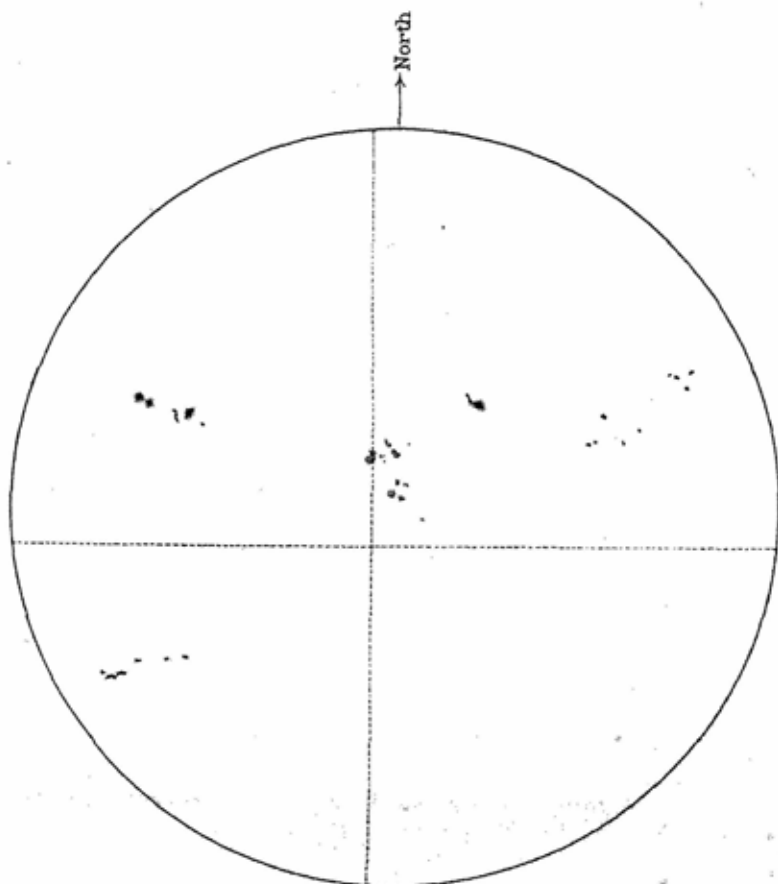
HUXLEY, THOMAS H. A Manual of the Anatomy of Vertebrated Animals. 8vo. London, 1871.

———. A Manual of the Anatomy of Invertebrated Animals. 12mo. London, 1877.

JUDD, JOHN W. Volcanoes: what they are and what they teach. 12mo. London, 1881.

MOHL, JULES. Vingt-sept ans d'Histoire des Etudes Orientaux. Rapports faits à la Société Asiatique de Paris de 1840 à 1867. 2 Vols. 8vo. Paris, 1879-80.

- SENART, E'. Les Inscriptions de Piyadasi. Vol. I. 8vo. Paris, 1881.
- SHERRING, REV. M. A. Hindu Tribes and Castes, as represented in Benares. Vol I. 4to. London, 1872.
- SULLY, JAMES. Illusions: a Psychological Study. 12mo. London, 1881.
- THOMSON, SIR C. WYVILLE. Report on the Scientific Results of the Voyage of H. M. S. "Challenger" during the years 1873-76; under the Command of Captain George S. Nares, R. N., F. R. S., and Captain Frank Turle Thomson, R. N. Zoology: Vols. I-II. 4to. London, 1880-81.
- TOD, LT.-COL. JAMES. Travels in Western India, embracing a visit to the Sacred Mounts of the Jains and the most Celebrated Shrines of Hindu Faith between Rajputana and the Indus; with an Account of the Ancient City of Nehrwalla. 4to. London, 1839.
- WATTS, HENRY. A Dictionary of Chemistry. Third Supplement, Part II. 8vo. London, 1881.
- ZIMMER, HEINRICH. Altindisches Leben. Die Cultur der Vedischen Arier nach den Samhita dargestellt. 8vo. Berlin, 1879.
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Tracing from Sun Negative taken at Dehra Observatory, Great Trigonometrical Survey of India.

Latitude $30^{\circ}19'29''$ N. Longitude $78^{\circ}5'42''$ E. Height above Sea 2232 feet, on July 25th 1881, at 4h.-47m. P.M., local apparent time.

Spots visible in previous Negative taken on the same day at 3h.-53m. P.M., are shewn in *Black*.

And the new spots which appeared between 4 and 5 P.M., are shewn in *Red*.



PROCEEDINGS
OF THE
ASIATIC SOCIETY OF BENGAL.
FOR DECEMBER, 1881.

The Monthly General Meeting of the Asiatic Society of Bengal was held on the 7th of December at 9 P. M.

The HON'BLE H. J. REYNOLDS, Vice-President, in the Chair.

The minutes of the last Meeting were read and confirmed.

The following presentations were announced :—

1. From the Home Department,—Oldenberg's Vinayapitakam, Vol. III.
2. From the Home Department, Forest Branch,—(1) Report of a visit to the Torrent Regions of the Hautes and Basses Alpes, and also to Mount Faron, Toulon, by E. McA. Moir,—(2) Suggestions regarding the management of the leased Forests of Busáhir in the Sutlej Valley of the Panjab, by Dr. D. Brandis.
3. From Raja Sourindro Mohun Tagore,—A set of his works in English, Sanskrit, Bengali and Hindi.
4. From the Authors,—(1) The adoption of a Prime Meridian to be common to all nations. The establishment of Standard Meridians for the Regulation of Time, by Sandford Fleming,—(2) An Address to the Fifth International Oriental Congress, 1881, by Dr. Ram Das Sen,—(3) Versuch einer Erklärung der auf einer Gemme im Besitze des Grafen S. Stroganov befindlichen Pehlewi-Inschrift, by B. Dorn,—(4) The Epoch of the Guptas, by Edward Thomas,—(5) On the Land-shells of the Island of Socotra collected by Prof. I. Bayley Balfour, Pt. II, by Lieut.-Col. H. H. Godwin-Austen,—(6) Readings from the Arian Pali, by Dr. A. F. R. Hoernle.
5. From the Superintendent, Marine Survey Department,—Chart of Curves of Equal Magnetic Variation in the Indian Ocean for 1880.
6. From the Surveyor General of India,—(1) A copy of the 5th Edition of the Map of Turkestan, and the countries between the British and Russian Dominions in Asia,—(2) Synopsis of the Results of the Opera-

tions of the Great Trigonometrical Survey of India, Vols. X, XI, XII, and XIII.

7. From the Government of Bengal,—Brief Summary of the Meteorology of Bengal, 1880.

The following Gentlemen, duly proposed by the Council at the last meeting, were ballotted for and elected Honorary Members of the Society:

1. Dr. William Wright.
2. Dr. Rudolph v. Roth.
3. Sir William Thomson.
4. Prof. Hermann L. F. Helmholtz.

The following Gentlemen, duly proposed and seconded at the last meeting, were ballotted for and elected Ordinary Members of the Society:

- R. Logan, Esq.
J. J. Monteath Esq., M. D.

The following Gentleman is a candidate for ballot at the next meeting:

Babu Girijabhushana Mukerji, M. A., proposed by Babu Protapa Chandra Ghosha, seconded by J. Wood-Mason, Esq.

The SECRETARY reported that the following Gentlemen had intimated their desire to withdraw from the Society:

- Major M. Protheroe.
Herr W. Joest.
Munshi Ganga Pershad.

The following papers were read—

1. *A numerical Estimate of the Species of Animals, chiefly Land and Freshwater, hitherto recorded from British India and its Dependencies.*—By WILLIAM T. BLANFORD, F. R. S.

(Abstract.)

This paper is an attempt to obtain a rough estimate of the number of species belonging to the animal kingdom hitherto recorded in British India and its Dependencies. The marine fauna inhabiting the seas around India being very imperfectly known, Mr. Blanford has confined himself, in all the sub-kingdoms except the Vertebrata, to the land and freshwater fauna alone. Although the data obtained are very imperfect, Mr. Blanford publishes them because they lead to some very curious results. The number of recorded species in each order of the various classes is given, together with the authorities from whom the data have been collected: and from this a final table giving the number of species in each class is compiled.

On this Mr. Blanford remarks: "The figures given are, I believe, a fair approximation to the truth, and the result is one that I think should make Anglo-Indian naturalists endeavour to improve our knowledge of the fauna. It is scarcely creditable that, in a perfectly accessible country, with facilities for travelling and for living in different parts of the area unrivalled within the tropics, we should remain so ignorant of the zoology. It is ridiculous to suppose that the Indian *Coleoptera* are scarcely more numerous than the *Lepidoptera*, that the *Hymenoptera* (which very probably rival, and may excel, each of the other orders) are only between $\frac{1}{2}$ and $\frac{2}{3}$ as numerous, or that the *Neuroptera*, of which, Mr. McLachlan tells me, about 1000 are known from Europe, are only represented by 350 species. As to the spiders, it is no exaggeration to say that in most parts of India 108 species (which is the total number hitherto described for the whole of India) might be collected in a few days' search. It is to be hoped that the next 5 years will witness a very considerable increase in our knowledge of the fauna of India."

This paper will be printed in full in the Journal, Part II, No. 4, for 1881.

2. *Notes on an apparently undescribed Varanus from Tenasserim, and on other Reptilia and Amphibia.*—By W. T. BLANFORD, F. R. S.

(Abstract.)

This paper gives a detailed description of a *Varanus* found in Tenasserim in the neighbourhood of Tavoy, which Mr. Blanford cannot identify with any known species. It may be immediately distinguished from all other Indian forms by its peculiar nostril, situated in a single scale, by the larger scales on the upper part of the body, and especially by the scales of the nape being larger than those above the head, or those on the back. There is also a description of a cobra differing in colour and to some slight extent in structure from any Indian form known to Mr. Blanford, the colouration being remarkably similar to that in the Central Asiatic type described by Eichwald under the name of *Tomyris oxiana*. This snake was found in Gilgit where several birds and mammals belonging to Central Asiatic types occur.

The paper also contains notes on specimens of *Draco taniopterus* found near Tavoy in Tenasserim, and on a species of *Pseudophidian*, *Iethyophis Glutinosus*, found near Darjeeling, being the first *Pseudophidian* recorded from the Himalayas.

This paper will be published in full in the Journal, Pt. II, No. 4, for 1881.

3. *Description of a new Species of Rostellaria, from the Bay of Bengal.*—By GEOFFREY NEVILL, C. M. Z. S.

This paper contains a description of a highly interesting and very characteristic form, quite unlike any of the other seven known living species of the genus, which was dredged in deep water off Cheduba, Arrakan Coast, by Surgeon J. Armstrong, late Naturalist to the Indian Marine Survey.

It will be published in full in the Journal, Pt. II, No. 4, for 1881.

4. *Description of a new Species of the Lepidopterous genus Euripus from North Eastern India.*—By J. WOOD-MASON, Deputy Superintendent, Indian Museum, Calcutta.

This paper will be published in full in the Journal, Pt. II, No. 4. for 1881.

LIBRARY.

The following additions have been made to the Library since the Meeting held in November last.

TRANSACTIONS, PROCEEDINGS AND JOURNALS,

presented by the respective Societies and Editors.

Berlin. K. preuss. Akad der Wissenschaften, Monatsbericht, June 1881.

Bombay. Royal Asiatic Society,—Journal, Vol. X, No. 28, 1871-72.

Bordeaux. Société de Géographie Commerciale, Bulletin, No. 21, 7th November 1881.

Calcutta. Geological Survey of India,—Memoirs, Vol. XVIII, Part 2.

Dresden. Kais. Leopoldinisch—Carolinische Deutsche Akademie der Naturforscher,—Nova Acta, Vol. XLI, Parts 1-2.

Leipzig. Deutsche morgenländische Gesellschaft,—Zeitschrift, Vol. XXXV, Parts 2 and 3.

Lisbon. Sociedade de Geographia,—Boletim, Second Series, No. 6.

Colonias portuguezas em paiz Estrangeiro. VIII. Em Marrocos, pelo consul geral e encarregado de negocios José Daniel Colaço.

London. The Academy,—Nos. 494-497.

———. The Athenæum,—Nos. 2817-2820.

———. Linnean Society,—Journal, Botany, Vol. XVIII, Nos. 108-113.

No. 108. *Murray, Geo.*—On the application of the Results of Pringsheim's recent Researches on Chlorophyll to the Life of the Lichen.

No. 109. *Brown, N. E.*—On some new *Aroidæ*; with Observations on other known forms:—Part I.

No. 110. *Bentham, Geo.*—Notes on *Orchidæ*.

No. 111. *Watt, Geo.*—Notes on the Vegetation, &c., of Chumba State and

British Lahoul; with Descriptions of new species. *Darwin, Francis*.—The Theory of the Growth of Cuttings; illustrated by observations on the Bramble, *Rubus fruticosus*.

No. 112. *Darwin, Francis*.—On the power possessed by Leaves of placing themselves at Right Angles to the direction of Incident Light. *Bidie, William*.—Remarks on the Indian Coffee-Leaf disease. *Cooke, M. C.*—The Coffee Disease in South America. *Clarke, C. B.*—On Right-hand and Left-hand Contortion.

No. 113. *Masters, Maxwell T.*—On the Conifers of Japan. *Clarke, C. B.*—On *Arnebia* and *Macrotonia*.

London. Linnean Society.—Journal, Zoology, Vol. XV, Nos. 84-85.

No. 84. *Carpenter, P. Herbert*.—On the Genus *Solanocerinus*, Goldfuss, and its Relations to recent *Comatulæ*. *Watson, Rev. Robert Boog*.—Mollusca of H. M. S. 'Challenger' Expedition.—Part VI. *Turritellidæ*.

No. 85. *Macdonald, John Denis*.—On the Classification of *Gasteropoda*. Part II. *Watson, Rev. Robert Boog*.—Mollusca of H. M. S. 'Challenger' Expedition.—Part VII.

———. ———. Transactions,—Zoology, Vol. II, Part 2.

Collingwood, Cuthbert.—On some new species of Nudibranchiate Mollusca from the Eastern Seas. *Lubbock, Sir John*.—On the Anatomy of Ants. *Haddon, Alfred C.*—On the Extinct Land Tortoises of Mauritius and Rodriguez.

———. ———. List of the Linnean Society, January, 1881.

———. Nature,—Vol. XXIV, Nos. 625-626; Vol. XXV, Nos. 627-628.

———. Royal Geographical Society,—Proceedings,—Vol. III, No. 9, September, 1881.

Stewart, Lt.-Col. C. E.—The Country of the Tekke Turkomans, and the Tejend and Murghab Rivers.

Mozambique. Sociedade de Geographia,—Boletim, No. 5, October, 1881.

Munich. Repertorium für Experimental-Physik, Vol. XVII, Nos. 11 and 12.

Weber, W. and *Zöllner, F.*—Elektrodynamische Widerstandsmessungen nach absolutem Maasse. *Puluj, Dr. J.*—Strahlende Elektrodenmaterie.—Neue Methode zur Bestimmung der magnetischen Declination auf Reisen nach Dom. Ragana.

Roma. Società degli Spettroscopisti Italiani,—Memorie, Vol. X, No. 9, September 1881.

Fizez, Ch.—Recherches sur l'élargissement des raies spectrales de l'hydrogène. *Fizez, Ch.*—Note sur l'analyse de la lumière de la comète de (δ) 1881. *Groneman, H. I. H.*—Recherches sur la nature de la lumière zodiacale.

Schaffhausen. La Société Entomologique Suisse,—Bulletin, Vol. VI, No. 4.

Simla. United Service Institution of India,—Journal, Vol. X, No. 48.

Stockholm. Kongliga Svenska Vetenskaps-Akademiens Förhandlingar,—Öfversigt, Vols. XXXIV-XXXVII, 1877-80.

Stockholm. Kongliga Svenska Vetenskaps-Akademiens,—Bihang, Vol. IV, Pts. 1 and 2; Vol. V, Parts 1 and 2.

———. Beskyddare Hans Maj. T. Konungen, May 1878 to May 1881.

———. Lefnadsteckningar, Vol. II, Part 1.

Zagreb. Arkeologickoga Druzstva,—Viestnik, Vol. III, No. 4.

BOOKS AND PAMPHLETS,

presented by the Authors.

DORN, B. Versuch einer Erklärung der auf einer Gemme im Besitze des Grafen S. Stroganov befindlichen Pehlewi-Inscription. 4to. St. Petersburg, 1881.

FLEMING, SANDFORD. The adoption of a Prime Meridian to be common to all nations. The establishment of Standard Meridians for the regulation of time. Read before the International Geographical Congress at Venice, September 1881. 8vo. London, 1881. Pam.

GODWIN-AUSTEN, LT.-COL. H. H. On the Land-shells of the Island of Socotra collected by Prof. I. Bayley Balfour. Part II. 8vo. London, 1881. Pam.

HOERNLE, DR. A. F. R. Readings from the Arian Pâli. 16mo. Bombay, 1881. Pam.

SEN, DR. RAM DAS. An Address to the Fifth International Oriental Congress, 1881. 8vo. Calcutta, 1881. Pam.

TAGORE, SOURINDRO MOHUN. A Brief Account of the Tagore Family. 8vo. Calcutta, 1868.

———. Short Notices of Hindu Musical Instruments. 32mo. Calcutta, 1877.

———. A few Lyrics of Owen Meredith set to Hindu Music. 8vo. Calcutta, 1877.

———. Six Principal Râgas, with a Brief View of Hindu Music. 4to. Calcutta, 1877.

———. Fifty Tunes composed and set to music. 8vo. Calcutta, 1878.

———. A Vedic Hymn. Fcp. Calcutta, 1878.

———. A few specimens of Indian Songs. 8vo. Calcutta, 1879.

———. Mani-Mâlâ, or a Treatise on Gems, Parts I and II. 8vo. Calcutta, 1879-81.

———. Veni-Sanhâra Nâtaka, or the Binding of the Braid, a Sanskrit Drama by Bhatta-Nârâyana, done into English. 8vo. Calcutta, 1880.

———. Roma-Kavya, or a short sketch of Roman History, from the Earliest Days of Antiquity to the present time, in Sanskrit verse. 8vo. Calcutta, 1880.

———. Eight Tunes, composed by. 8vo. Calcutta, 1880.

TAGORE, SOURINDRO MOHUN. *The Eight Principal Rasas of the Hindus, with Murtti and Vrindaka, or Tableaux and Dramatic Pieces illustrating their character.* 4to. Calcutta, 1880.

———. *The Ten Principal Avatárs of the Hindus, with a short history of each incarnation and directions for the representation of the Múrttis as Tableaux Vivants.* 4to. Calcutta, 1880.

———. *The Dramatic Sentiments of the Aryas.* 8vo. Calcutta, 1881.

———. *The Five Principal Musicians of the Hindus, or a brief exposition of the Essential Elements of Hindu Music, as set forth by the five Celestial Musicians of India, an offering to the Fifth International Congress of Orientalists, to be held at Berlin in September 1881.* 4to. Calcutta, 1881.

THOMAS, EDW. *The Epoch of the Guptas.* Pamphlet, 8vo. London, 1881.

MISCELLANEOUS PRESENTATIONS.

The Indian Forester, Vol. VII, No. 2, October 1881. 8vo. Calcutta, 1881.

Report on the External Trade of Bengal with Nepal, Sikkim and Bbutan, for the year 1880-81. Fcp. Calcutta, 1881.

Report on the Administration of the Customs Department in the Bengal Presidency for the official year 1880-81. Fcp. Calcutta, 1881.

Annual Report on Emigration from the Port of Calcutta to British and Foreign Colonies for 1880-81. Fcp. Calcutta, 1881.

Brief Summary of the Meteorology of Bengal, 1880. Fcp. Calcutta, 1881.

BENGAL GOVERNMENT.

The Indian Antiquary, Vol. X, Part 125, November 1881. 4to. Bombay, 1881.

Fallon's New English-Hindustani Dictionary, Part V, September 1881. 8vo. Benares, 1881.

MOIR, E. McA. *Report of a visit to the Torrent Regions of the Hautes and Basses Alpes, and also to Mount Faron, Toulon.* Fcp. Calcutta, 1881.

OLDENBERG, DR. H. *The Vinayapitakam*, Vol. III. 8vo. London, 1881.

BRANDIS, DR. D. *Suggestions regarding the management of the leased Forests of Busahir in the Sutlej valley of the Punjab.* Fcp. Simla, 1881.

HOME DEPARTMENT.

Annual Report on the Civil Hospitals and Dispensaries in the Madras Presidency for the year 1880. Fcp. Madras, 1881.

Annual Medical Report of the Madras Government Lying-in Hospital for the year 1880. Fcp. Madras, 1881.

MADRAS GOVERNMENT.

Synopsis of the Results of the Operations of the Great Trigonometrical Survey of India, Vols. X, XI, XII and XIII. 4to. Dehra Dun, 1880.
SURVEY OF INDIA.

PERIODICALS PURCHASED.

- Calcutta. Indian Medical Gazette,—Vol. XVI, No. 11, November 1881.
 ———. Stray Feathers,—Vol. IX, Nos. 5 and 6, 1880.
 Geneva. Archives des Sciences Physiques et Naturelles,—Vol. VI, No. 10.
 Pringsheim.—Recherches sur le rôle de la chlorophylle dans les végétaux.
 Göttingen. Gelehrte Anzeigen,—Nos. 41-44.
 Leipzig. Annalen der Physik und Chemie,—Vol. XIV, No. 10.
 ———. Beiblätter,—Vol. V, No. 10.
 ———. Botanisches Centralblatt,—Vol. VII, Nos. 8-10.
 ———. Literarisches Centralblatt,—Nos. 35-38.
 London. Annals and Magazine of Natural History,—Vol. VIII, No. 45, September 1881.
 Bate, C. Spence.—On the *Pensidea*. *Miers, Edward J.*—On a collection of Crustacea made by Baron Hermann-Maltz at Goree Island, Senegambia.
 Smith, Edgar A.—Remarks upon Mr. Wood-Mason's Paper "On the Discrimination of the Sexes in the Genus *Paludina*." *Carter, H. J.*—On *Spongophaga* in *Spongilla*. *Scully, J.*—On some Mammals from Kandahar.
 ———. Chemical News,—Vol. XLIV, Nos. 1143-1146.
 No. 1144. *Braham, Philip.*—On Crystals produced by the Action of Metals sealed up in Carbon Disulphide.
 ———. Entomologist,—Vol. XIV, No. 220, September 1881.
 ———. Entomologist's Monthly Magazine,—Vol. XVIII, No. 208, September 1881.
 Hellins, Rev. J.—On the variable number of moults in larvæ from the same batch of eggs.
 ———. Journal of Botany,—Vol. X, No. 225, September 1881.
 ———. Journal of Science,—Vol. III, No. 93, September 1881.
 Slater, J. W.—On *Diptera* as Spreaders of Disease.
 ———. London, Edinburgh and Dublin Philosophical Magazine,—Vol. XII, No. 74, September 1881.
 Gray, Thomas.—On Instruments for measuring and Recording Earthquake-Motions.
 ———. Messenger of Mathematics,—Vol. XI, No. 4, August 1881.
 Cox, H.—On the distance of rainbows.
 ———. Nineteenth Century,—No. 55, September 1881.
 Bevington, Louisa S.—How to eat bread. *Laveleye, E'mile de.*—The future of gold.
 ———. Publishers' Circular,—Vol. XLIV, Nos. 1058-1059.

London. Quarterly Journal of Pure and Applied Mathematics,—Vol. XVII, No. 68.

———. Society of Arts,—Journal, Vol. XXIX, Nos. 1509-1512.

No. 1509. *Carter, R. Brudenell*.—Cantor Lectures :—Colour Blindness.

Paris. Comptes Rendus,—Vol. XCIII, Nos. 15-18.

No. 15. *Avignon*.—Sur l'emploi du goudron, comme préservatif contre le Phylloxera. Note concernant l'utilisation des eaux mères des marais salants pour les bains destinés à la liqutation du soufre, dans leur procédé d'extraction industrielle de ce corps. *Coggia*.—Comète découverte par M. Denning, le 4 Octobre 1881 ; observation faite à l'Observatoire de Marseille. *Lalagade, G. de*.—Sur les bruits qui se produisent dans un circuit téléphonique, par les temps d'orage. *Yung, E.*—De l'innervation du cœur et de l'action des poisons chez les Mollusques lamellibranches. *Sudour, E. and Caraven-Cachin, A.*—Empoisonnement par les graines de l'*Euphorbia lathyris* (L.), et nouvelles expériences sur leur usage thérapeutique.

No. 17. *Bell, Al. Graham*.—Sur un appareil permettant de déterminer, sans douleur pour le patient, la position d'un projectile de plomb ou d'autre métal dans le corps humain. *Laveran, A.*—De la nature parasitaire des accidents de l'impaludisme. *Letellier, A.*—Note sur les précautions à prendre pour éviter les falsifications du lait. *Duponchel*.—Note concernant l'influence du mouvement des grosses planètes dans la périodicité des taches Solaires.

———. Journal des Savants,—October 1881.

———. Revue Critique,—Vol. XII, Nos. 42-45.

———. Revue des deux Mondes,—Vol. XLVII, No. 4 ; and Vol. XLVIII, No. 1.

No. 4. *Janet, Paul*.—La Philosophie de la Croyance, à l'occasion d'un livre récent. *Lasegue, Ch.*—Le Braidisme. *Brunetière, F.*—La Déformation de la Langue par l'Argot, à propos de livres récents.

———. Revue de Linguistique,—Vol. XIV, 15th October 1881.

———. Revue Scientifique,—Vol. XXVIII, Nos. 17-20.

BOOKS PURCHASED.

BENFEY, TH. *Vedica und Linguistica*. 12mo. Strassburg, 1880.

CUSHING, J. N. *A Shan and English Dictionary*. 8vo. Rangoon, 1881.

GESENIUS, GUIL. *Scripturæ Linguaeque Phœnicæ monumenta quot quot supersunt*. 4to. Lipsiæ, 1837.

GOLDSMID, MAJ.-GEN. SIR F. J. *James Outram : a Biography*, 2 Vols. 8vo. London, 1881.

LOW, CHARLES RATHBONE. *The Afghan War, 1838-42, from the Journal and Correspondence of the late Major-General Augustus Abbott*. 8vo. London, 1879.

OLDFIELD, HENRY A. *Sketches from Nipal, Historical and Descriptive, with Anecdotes of the Court Life and Wild Sports of the Country in the*

time of Maharaja Jung Bahadur, G. C. B., to which is added an Essay on Nepalese Buddhism, and illustrations of Religious Monuments, Architecture, and Scenery from the Author's own Drawings. 2 Vols. 8vo. London, 1880.

PALMER, E. H. The Arabic Manual, comprising a condensed Grammar of both the Classical and Modern Arabic; reading lessons and exercises, with analyses; and a vocabulary of useful words. 12mo. London, 1881.

SHADWELL, LIEUT.-GENL. LAWRENCE. The Life of Colin Campbell, Lord Clyde. Illustrated by extracts from his Diary and Correspondence. 2 Vols. 8vo. London, 1881.

TOD, LIEUT.-COL. JAMES. Annals and Antiquities of Rajasthan, or the Central and Western Rajpoot States of India. 2 Vols. Second Edition. (Reprint.) 4to. Calcutta, 1877-79.

TYNDALL, JOHN. Essays on the Floating Matter of the Air in relation to Putrefaction and Infection. 8vo. London, 1881.

WHEELER, J. TALBOYS. The History of India from the Earliest Ages. Vol. IV, Pt. 2. 8vo. London, 1881.

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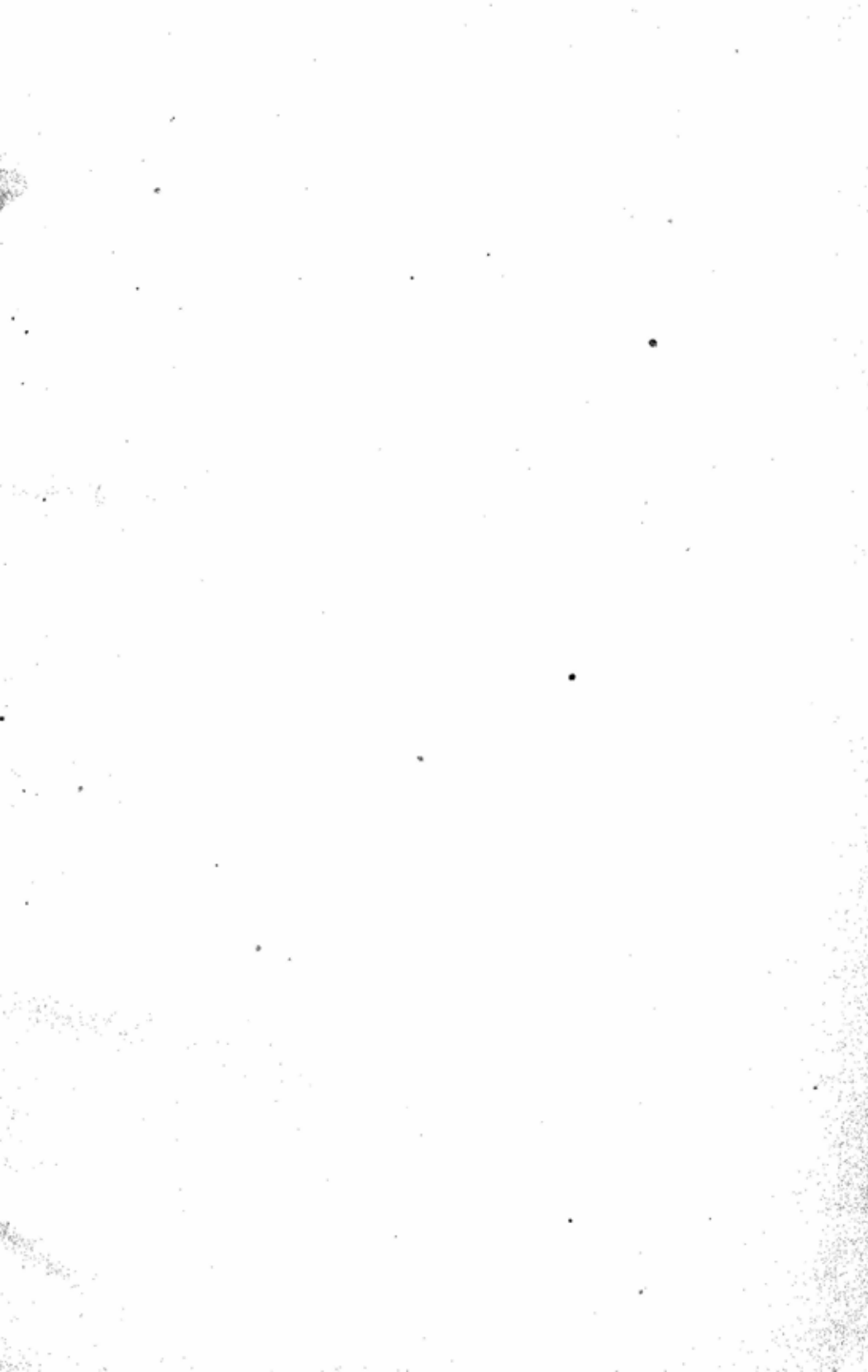
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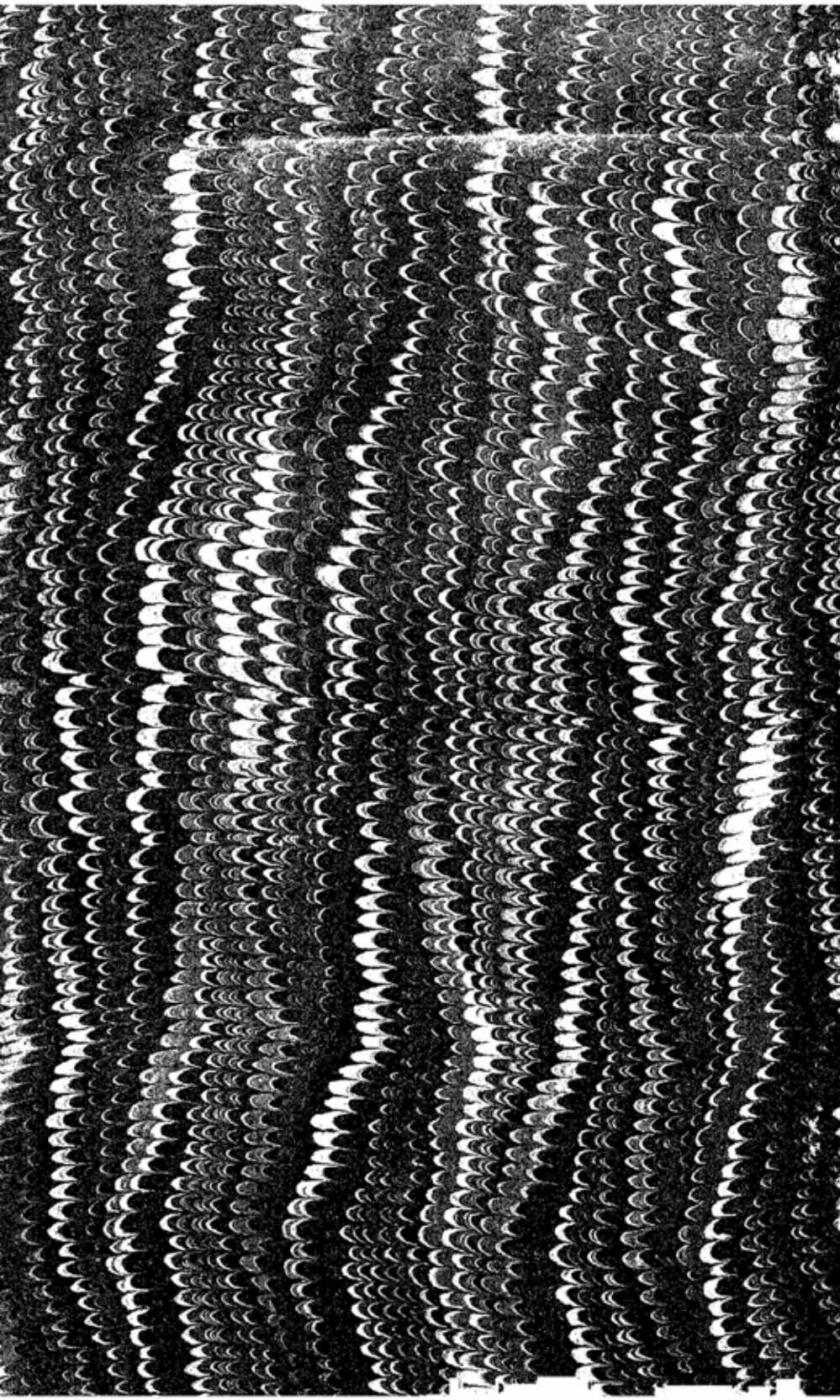
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