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THE FAIYUM

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SINAI

SUDAN

KENYA

by HENRY FIELD

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PREFACE

On October 1, 1947, President Robert G. Sproul appointed me Physical Anthropologist to the University of California African Expedition, which conducted paleontological, zoölogical, anthropological, archaeological, and medical research from Cairo to Cape Town.

Since 1925 my anthropometric survey for the Field Museum of Natural History from Transjordan (now the Hashemite Kingdom of Jordan) to the central Caucasus had indicated physical and cultural links with Egypt, it was most desirable to record new data there with the Harvard-Oxford technique and to compile comparative statistical tables for the Nile Valley and Sinai.

As the expedition moved southward, I was able to work in northern Sudan from Wadi Halfa to Khartoum and with the Masai in Kenya.

Miss Emily C. Davis and Miss Theodore Sedgwick assisted in the compilation of background material. Miss Sedgwick also worked on the complicated Masai phrase book.

Through the kindness of Mr. Thomas J. Watson, tabulation of the anthropometric data was made by International Business Machines in Boston. The statistical calculations were prepared by Miss Natalie K. Bill (now Mrs. Theodore L. Stoddard, Jr.) of the Peabody Museum at Harvard under the supervision of Dr. E. A. Hooton. My wife and I hand-tabulated part of the anthropometric observations. My gratitude must be expressed to Miss Elizabeth Beverly, who checked the final text and typed the final draft.

For convenience, the reports on the Faiyum, Sinai, Sudan, and Kenya have been treated as four separate studies.

In conclusion I would like to acknowledge the cordial coöperation of President Sproul and Dean A. R. Davis of the University of California. I am also grateful to Mr. John H. Jennings for editorial suggestions and for seeing the entire manuscript through the press.

free from author

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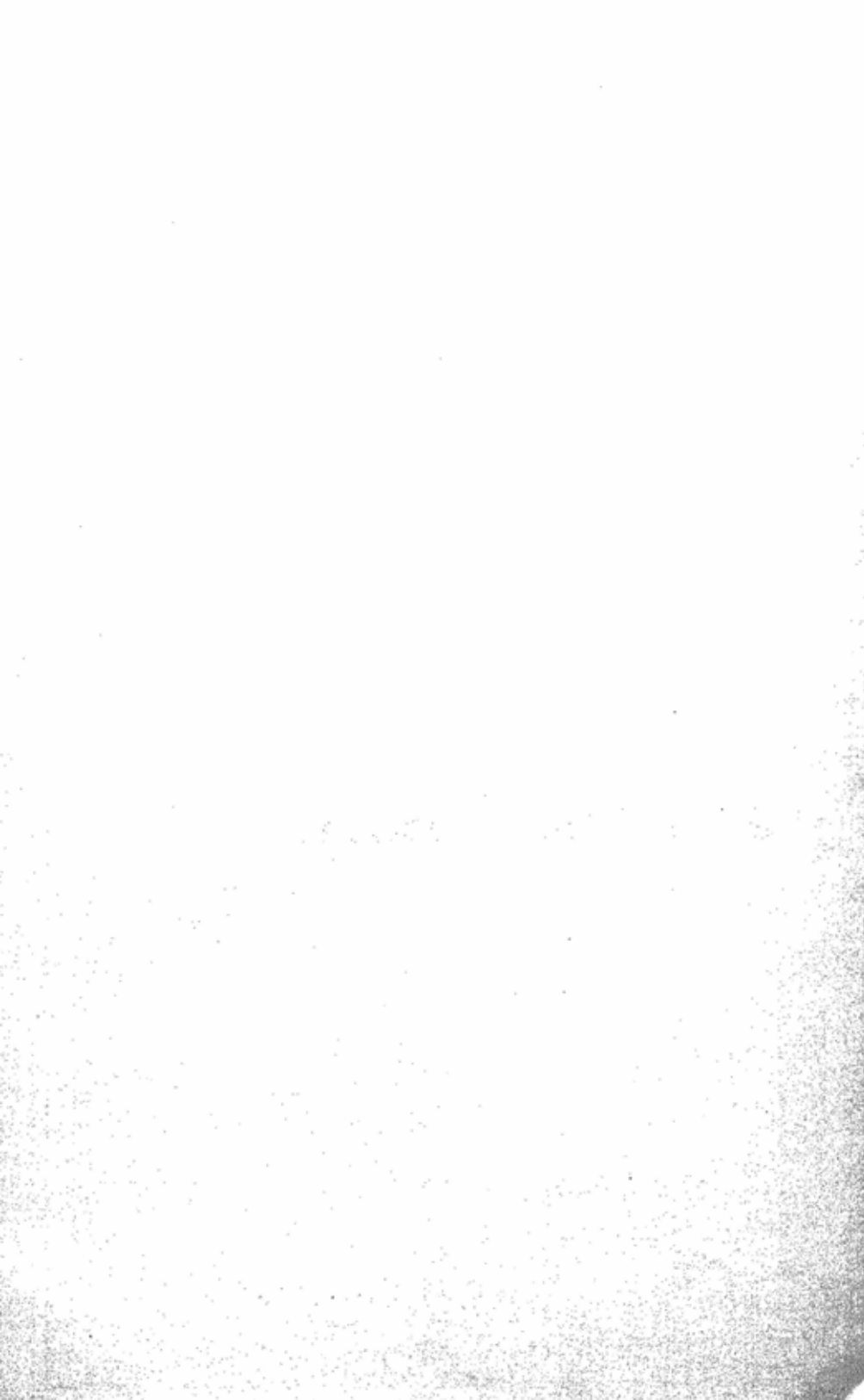
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PART ONE **THE FAIYUM**



On November 18, 1947, I reached Cairo to begin work in the Faiyum. Through the courtesy of the Egyptian government, the expedition base camp was at Kom Oshim, at the eastern entrance to the Faiyum.

With the permission and generous encouragement of the late Prime Minister Nukrashî Pasha, Minister of Education Sanhourî Pasha, and the Governor and Chief of Police of the Faiyum, an anthropometric survey of Tamiya was begun.

The following acknowledgments of special assistance are gratefully recorded:

1. Tamiya: Dr. Salah ed-Din, medical officer, who speaks excellent English and offered every facility for research, including part of the dispensary for laboratory work.

Tewfiq el-Kuliby, owner of the cotton-ginning plant with 400 workers, who supplied the subjects for anthropometric study.

Shortly after I had begun to measure, observe, and photograph the villagers of Tamiya, it was clear that additional information was most desirable in order to have a key study to the Faiyum. Therefore, through Dr. S. A. Huzayyin, prehistorian attached to the expedition and Professor of Geography at Farouk I University, Alexandria, I suggested to Dr. Mohammed M. Sadr, Assistant Professor of Biochemistry, Faculty of Medicine, Abbassiyeh, Cairo, that a medical-nutritional survey be made at Tamiya. Dr. Sadr and I worked out a plan, which was submitted through Monim Bey to the Minister of Health. Five days later a completely staffed mobile nutritional unit began work in Tamiya. The staff included: Dr. Lutfi, medical and blood examinations; Abdul Khalim, economic studies; Sitt Fatma, economic and social studies on women; Abdul Kadr, economic and social studies on men; Dr. Sulaiman, blood-grouping analysis; and Abdul Rahman, biochemist. This group, or substitutes, remained at Tamiya for ten weeks.

A series of racial type photographs were taken by Mr. and Mrs. William B. Terry, staff members of the expedition.

Charles D. Evans, T/S USMCR and expedition photographer, obtained part of the agricultural notes on Tamiya Daira (farms) from Fuad Ali, general manager of local agricultural development.

Among the early travelers,¹ I have selected Lenoir (pp. 87-95), who described his visit to Tamiya (Tamiyeh) during 1872 as arriving at an oasis surrounded by sand. He mentions the minaret as dominating the small houses and the many small streams. A large wild boar, weighing 300 pounds or more, was shot near the village and a feast prepared. The villagers, who were Copts, joined in the meal, as did the incessantly barking dogs. He refers to the ducks as being more numerous than "the stars in the sky or grains of sand on the seashore."

2. Fidimin: As a source of another racial sample from the Faiyum, then recovering from a cholera epidemic, Lieutenant Salah Habib of Fanus Brothers Police Post near Kom Oshim suggested Fidimin in the center of the rich citrus belt. He assisted our studies both in Tamiya and in Fidimin, where Police Lieutenant Hassan el-Magid acted as organizer, interpreter, and part-time recorder.

The raw data have been placed on Microfilm 2940, pp. 1-94, in the American Documentation Institute, 1719 N Street N.W., Washington 6, D.C., where copies may be purchased.

In addition, the following material has been placed on Microfilm 3226, pp. 1-53, in ADI:

No.	Title	Pages
1	The Land and the People	18
2	Agricultural Statistics	13
3	Trip around the Faiyum	9
4	Traverse Report in Jebel Qatrani Area	8

Diacritical markings have been omitted from proper names throughout. Our gratitude is due the Egyptian government for assisting and encouraging our researches in the Faiyum.

THE PHYSICAL ANTHROPOLOGY OF TAMIYA AND FIDIMIN

Two typical centers were selected for sampling: Tamiya, a village in the northeastern part of the Faiyum; and Fidimin, the richest community in the citrus area, in the north-central part.

TAMIYA

This village has one long main street flanked by mud-brick houses. The boy's school, the medical dispensary, and a small mosque dominated by a superb glazed minaret are at the western end of the village. The market lines both sides of the central section.

At the southwestern end there are mound after mound of ruins, called "Sinn el-Jebel," containing Egyptian sherds from the second millennium B.C., Hellenistic and Hellenistic-Roman sherds and vases from the period between the third century B.C. and the second century A.D., and Byzantine and Byzantine-Arab sherds. Above these remains of sedentary occupation are great numbers of burial places, with bones littering the top of the ground. These burial places probably date from about the ninth century A.D. Since they are now neglected and obviously have been so for many generations, it probably follows that they represent the cemetery of the oldest Arab village on the modern site of Tamiya. This ancient village may have flourished between the ninth and fifteenth centuries and may have been abandoned about the time of the Turkish conquest in the sixteenth century. The modern settlers of Tamiya have no knowledge of the ancient cemetery.

Daira Tamiya consists of 4,000 acres, now owned by the Egyptian government. Formerly this land belonged to two Italians but was confiscated during World War II. The entire area remains under cultivation throughout the year. Between four hundred and six hundred workers (fellahin) are employed daily. The value of farm machinery has been estimated at £E 7,000; the annual maintenance costs approximately £E 1,200. New machinery is purchased each year, at a cost of about £E 500. However, most of the equipment is now out-of-date except for some new tractors and two new trucks.

There are four hundred cattle, which furnish beef and milk and are also used to pull the wooden plows.

At the present time special efforts are being made to improve the stock, the best results to date having been obtained by crossing the Holstein bull with the Egyptian cow.

Tamiya maintains its own electric plant, flour mill, and stores for selling seed and cattle. The cotton mill, owned by the Misr Society for Ginning Cotton, annually produces about 550 kinta (173,250 pounds).

I began work in Tamiya in December, 1947, on subjects from the cotton-ginning plant. Shortly after I had begun to measure, observe, and photograph the villagers, it was evident that additional information would be necessary before the key study to the Faiyum could be completed. Therefore, I suggested to the authorities at Cairo that a medical-nutritional survey be made at Tamiya.

In my opinion, this survey should include: a nutritional survey of at least 500 families, to be selected from every quarter of the village, who would be given a complete physical examination; blood classification of at least 150 males and some complete families; blood smears for differential count and identification of parasites; a socioeconomic survey; and a detailed analysis of the villagers' food and water.

This plan was submitted to the Minister of Health, and five days later a completely staffed and equipped mobile nutritional unit began work in Tamiya. The Egyptian government expressed great enthusiasm about this anthropological-medical-nutritional survey, which took ten weeks to complete. I measured 189 men, all born in Tamiya as had been each of their parents.

Vital Statistics. -- Each tribesman was requested to give the following information, which has been tabulated.

DEMOGRAPHY

	0	1	2	3-4	5-6	7-8	9	10	15
Brothers									
Living.....	46	59	40	32	8	1	0	0	0
Dead.....	49	32	39	50	11	4	1	1	1
Sisters									
Living.....	39	54	60	27	10	0	0	0	0
Dead.....	74	34	37	37	6	2	0	0	0
Married.....	103								
Married recently....	9								

DEMOGRAPHY

	0	1	2	3-4	5-6	7-8	9	10	15
Single.....	81								
Divorced.....	1								
Sons									
Living.....	40	29	18	5	5	0	0	0	0
Dead.....	54	7	18	15	2	1	0	0	0
Daughters									
Living.....	55	19	13	12	1	0	0	0	0
Dead.....	59	16	9	12	1	1	0	0	0

In Tamiya the birth rate and death rate are both high, although the figures for sisters and daughters are never reliable in a Moslem community, especially when the interrogator is a foreign Christian. In order to reduce errors or omissions to a minimum, several local assistants encouraged accurate replies.

Age. -- The average age for 189 males was between thirty and thirty-one, with a range from eighteen to ninety. About one-quarter were less than thirty or more than fifty years old. The wide range should give a reasonable sample.

AGE DISTRIBUTION

Age	No.	Per cent	Age	No.	Per cent
18-19.....	11	7.43	45-49.....	23	15.54
20-24.....	6	4.05	50-54.....	22	14.86
25-29.....	20	13.51	55-59.....	10	6.76
30-34.....	16	10.81	60-64.....	11	7.43
35-39.....	17	11.49	65-69.....	1	0.68
40-44.....	11	7.43			
			Total...148		99.99

MORPHOLOGICAL CHARACTERS OF TAMIYA FELLAHIN

Skin. -- The majority were brunet, and some had darker skins. The fellahin working in the fields around Tamiya are naturally more exposed to the sun and wind than my sample, the majority of whom worked in the cotton-gin buildings. The secondary shadings of different parts of the body were in no way peculiar, but the exposed parts were slightly darker than those habitually exposed. Nine men had some Negroid blood. No. 182 had an olive complexion. No. 190 had a whitish-pink scalp under his thin hair.

SKIN COLOR

Color	Forehead	Per cent	Inner Right Arm	Per cent
Pale.....	12	6.32	10	5.29
Pink.....	4	2.10	2	1.06
Brunet.....	136	71.58	139	73.54
Swarthy.....	28	14.74	28	14.82
Medium brown...	1	0.53	1	0.53
Chocolate.....	3	1.58	4	2.12
Dark brown.....	6	3.16	5	2.65
Total.....	190	100.01	189	100.01

Freckles. -- They were observed as absent (167), some (15), plus (3), double plus (2), and massed (1).

Moles. -- These were recorded as absent (126), few (60), and many (0).

Hair. -- The hair was dark brown with low waves and medium in texture.

HAIR

Color: Head	No.	Per cent
Black.....	3	1.59
Dark brown.....	176	93.12
Brown.....	1	0.53
Golden brown.....	1	0.53
White.....	8	4.23
Total.....	189	100.00
Form	No.	Per cent
Low waves.....	154	82.80
Deep waves.....	20	10.75
Curly.....	5	2.69
Frizzly.....	7	3.76
Total.....	186	100.00
Texture	No.	Per cent
Coarse.....	22	11.89
Medium.....	116	62.70
Fine.....	47	25.41
Total.....	185	100.00

HAIR		No.	Per cent
Color: Beard, Mustache			
Black.....	2	1.06	
Dark brown.....	174	92.06	
Brown.....	3	1.59	
Reddish brown.....	4	2.12	
Golden brown.....	1	0.53	
White.....	<u>5</u>	<u>2.65</u>	
Total.....	189	100.01	

The quantity of hair on the head and in the beard was recorded as follows:

HAIR QUANTITY

Amount	Head	Per cent	Amount	Beard	Per cent
Some.....	28	14.97	Very slight..	59	31.55
Average.....	113	60.43	Some.....	57	30.48
Double plus...	<u>46</u>	<u>24.60</u>	Plus.....	62	33.16
			Double plus..	<u>9</u>	<u>4.81</u>
Total....	187	100.00	Total...187	100.00	

GRAYNESS

Amount	Head	Per cent	Amount	Beard	Per cent
Absent.....	130	70.65	Absent.....	136	73.51
Some.....	23	12.50	Some.....	27	14.59
Plus.....	24	13.04	Plus.....	19	10.27
Double plus...	<u>7</u>	<u>3.80</u>	Double plus..	<u>3</u>	<u>1.62</u>
Total....	184	99.99	185	99.99	

BALDNESS

Amount	No.	Per cent
Absent.....	128	70.72
Some.....	24	13.26
Plus.....	15	8.28
Double plus.....	<u>14</u>	<u>7.73</u>
Total.....	181	99.99

BODY HAIR

Amount	No.	Per cent
Absent.....	109	57.98
Some.....	29	15.43
Plus.....	43	22.87
Double plus.....	<u>7</u>	<u>3.72</u>
Total.....	188	100.00

Abnormal hairiness of the body was not observed except in seven cases.

Eyebrows and Browridges. -- No. 84 had large, bushy eyebrows, an unusual feature among Arabs. The concurrency of the eyebrows and the amount of browridges are as follows:

EYEBROWS

BROWRIDGES

Amount	No.	Per cent	Amount	No.	Per cent
Absent.....	37	20.10	Absent.....	2	1.12
Some.....	72	39.13	Some.....	17	9.55
Average.....	69	37.50	Average.....	152	85.39
Double plus..	6	3.26	Double plus..	6	3.37
Triple plus..	<u>0</u>	<u>....</u>	Triple plus..	<u>1</u>	<u>0.56</u>
Total... 184	99.99		178	99.99	

Eyes. -- In general, the eyes were dark brown. However, the seventeen men (9.83 per cent) with mixed eyes indicate a minor element of submerged blondism. The iris was clear in the majority of cases. The eyes, or more properly the eye slits, were horizontal as in Europeans. Nos. 23, 40, 59, 60, 63, 66, 77, 86, 104, 105, and 109 were omitted from the series.

EYES

Color	No.	Per cent
Black.....	0	.....
Dark brown.....	152	87.86
Blue-brown.....	2	1.16
Green-brown.....	14	8.09
Light brown.....	4	2.31
Blue-gray.....	<u>1</u>	<u>0.58</u>
Total.....	173	100.00

EYES

<u>Iris</u>	<u>No.</u>	<u>Per cent</u>
Clear.....	112	64.74
Rayed.....	16	9.25
Zoned.....	13	7.51
Spotted.....	<u>32</u>	<u>18.50</u>
Total.....	173	100.00

The following notes were recorded: Blind, Nos. 92 and 166. Right eye blind, Nos. 16, 32, 52, 105, 121, 126, and 142. Left eye blind, Nos. 174 and 184. Nos. 84 and 158 had poor vision in the left eye, and Nos. 80 and 152 in both eyes. No. 32 had the left eye out of alignment. No. 163 had a gray patch on outer margin of the right eye, but he stated that his vision was unaffected. No. 149 had a small cataract in the left eye. Nos. 54 and 135 had both eyes infected. No. 80 wore a string through each helix "to strengthen his eyes." No. 165 and his father possessed light eyes. No. 26 had cut a notch in the apex of each ear "to make his eyes stronger," and No. 2 had a brass ring through his right ear for the same reason.

Nose. -- The profile showed great variation, the largest group possessing straight noses. The wings were medium, but twenty-seven men had flaring alae. Nine men had Negroid blood.

NOSE

<u>Profile</u>	<u>No.</u>	<u>Per cent</u>
Wavy.....	12	6.45
Concave.....	43	23.12
Straight.....	83	44.62
Convex.....	<u>48</u>	<u>25.81</u>
Total.....	186	100.00

<u>Wings</u>	<u>No.</u>	<u>Per cent</u>
Compressed.....	26	13.90
Medium.....	134	71.66
Flaring.....	<u>27</u>	<u>14.44</u>
Total.....	187	100.00

NASAL TIP THICKNESS

Amount	No.	Per cent
Some.....	46	24.60
Average.....	121	64.70
Double plus.....	18	9.62
Triple plus.....	2	1.07
Total.....	187	99.99

Mouth. -- The majority had lips of average integumental thickness, but twelve men had double plus lower lips with considerable eversion. Nine men were Negroid.

INTEGUMENTAL LIP THICKNESS

Amount	No.	Per cent	Lower	No.	Per cent
Some.....	2	7.41	Some.....	0	....
Average.....	25	92.59	Average.....	0	....
Double plus...	0	....	Double plus...	12	100.00
Total.....	27	100.00		12	100.00

Teeth. -- The occlusion was normal slight overbite. The number of teeth lost and the degree of wear indicate relatively good teeth for a village group with access to sugar and canned food. Eruption was recorded as complete (77) and partial (69). Crowding was observed as absent (115), plus (43), and double or triple plus (16). No. 169 had a gold tooth.

TEETH

Bite	No.	Per cent
Under.....	0	....
Edge-to-edge.....	5	2.75
Slight over.....	148	81.32
Marked over.....	29	15.93
Total.....	182	100.00

TEETH

Loss	No.	Per cent
None.....	93	49.21
Few.....	72	38.10
Some.....	10	5.29
Plus.....	4	2.12
Double plus.....	<u>10</u>	<u>5.29</u>
Total.....	189	100.01

Wear	No.	Per cent
Absent, some.....	72	38.71
Plus.....	81	43.55
Double plus, triple plus.....	<u>33</u>	<u>17.74</u>
Total.....	186	100.00

Ears. -- The ears were normal in size with attached or soldered lobes and of average protrusion.

EARS

Size	No.	Per cent	Lobe	No.	Per cent
Very small...	4	2.12	Soldered...	78	41.50
Small.....	39	20.63	Attached...	96	51.06
Average.....	122	64.55	Free.....	<u>14</u>	<u>7.44</u>
Double plus..	<u>24</u>	<u>12.70</u>			
Total.....	189	100.00	Total...	188	100.00

Protrusion	No.	Per cent
Small.....	12	6.56
Average.....	154	84.15
Double plus.....	<u>17</u>	<u>9.29</u>
Total.....	183	100.00

Musculature and Health. -- The sample of Tamiya villagers examined had a well-developed musculature and were in good health. Statistical details were recorded by the mobile unit.

Disease. -- Favus on head was seen in Nos. 21, 43, 50, 77, 128, 136, 145, and 190. No. 110 had a skin disease on the neck. No. 5 had scars on the cheeks, but not smallpox according to Dr. Salah. No. 44 had very shaky hands.

Smallpox. -- Nos. 4, 22, and 89 had scars.

Scars. -- Nos. 76, 128, 142, and 174 bore a scar above glabella, No. 128 on right bizygomatic arch, No. 120 near bregma, and No. 88 on right temple. Other scars were recorded as follows: No. 83, three on sternum "from fish bite"; No. 100, from abscess on upper right forearm; No. 169, from boil beside left nostril; No. 172, from boils that remained as open sores for three years; and No. 146, on left temple resulting from a fall from a bullock (gamuss).

Cicatrization. -- Nos. 5, 147, and 184 had three parallel lines cut in each temple with a razor by their fathers "to strengthen their eyes." Similar cuts were made on each temple of Nos. 127 and 189. No. 162 had two cuts on each temple.

Tattooing. -- Of 190 men, 93 were tattooed.³ The following individual observations were made:

No.	Tattooed Design and Purpose
2.....	Four spots surmounting three vertical bars on each temple "to make him live long." Name and address in Arabic on inner right forearm. Two girls on each upper arm.
4.....	Spot on chin "for beauty."
9.....	Bird on left temple "for beauty."
18.....	Bird on left temple "for beauty"; done while a child.
20, 21.....	Bird on each temple.
22.....	Three vertical lines on each temple "to make him strong."
24.....	Twelve-rayed sun "for beauty," also name and address in Arabic inside right forearm.
25.....	Name and address in Arabic inside right forearm. Bird on each temple. Glove and design on back of right hand. Girl holding crossed swords on inner right forearm.
26.....	Glove on back of right hand.
27.....	Name and address in Arabic on inner right upper arm. Three vertical lines on outer right forearm "to relieve pain." Spot on right wrist and string ⁵ circlet "to give strength."

No.	Tattooed Design and Purpose
29.....	Glove design (<u>shagr</u> = branches) on back of right hand. Three spots arranged in triangle on back of right wrist "for beauty" during childhood.
30.....	Bird on each temple. Two lions and tree on back of right hand. Crossed fish on back of left hand. Done by man during childhood.
31.....	Bird on each temple.
32.....	Three spots, bird and fish, and lines of v's on back of right hand. One spot on back of right thumb. Name and address in Arabic inside right forearm. Bird on each temple. Three spots at top of spine. Spot behind each ear.
33.....	Bird on each temple.
34.....	Bird on each temple.
40.....	Three spots on back of right wrist "to strengthen sprain."
42.....	Girl on inner right forearm.
43.....	Three spots on back of right wrist.
44.....	Three spots at the top of the spine and back of left wrist. Sun on back of right wrist.
45.....	Three spots on back of right wrist
46.....	Bird on each temple.
48.....	Spot below hairline above glabella.
49.....	Three spots on right wrist.
50.....	Name and address in Arabic on inner right forearm. Lion and tree on back of right hand.
51.....	Bird on each temple. Name and address in Arabic on inner right forearm.
52.....	Three spots on sternum.
53.....	Bird on each temple.
56.....	Three spots on right wrist.
61.....	Three spots on right wrist.
64.....	Bird on each temple.
68.....	Three spots on each temple.
70.....	Three spots on each temple.
75.....	Bird on each temple.
78.....	Bird on each temple.
79.....	Lion and spot on inner right forearm. Tree design at base of right thumb up to

No.	Tattooed Design and Purpose
	forefinger. Four spots on inner left forearm; sun and three spots on outer left forearm.
87.....	Bird on each temple. Name and address in Arabic on inner right forearm.
96.....	Three spots and a sun, and three spots and a tree on right forearm and hand. Line with seven bars across back of right wrist. Three spots at base of right thumb.
99.....	Three spots on each temple.
100.....	Bird on each temple. Spot beside right nostril. Three spots and glove design on back of right hand.
108.....	Three spots on back of right hand. Spot beside right nostril, another on chin; both during childhood. Branch of tree on right hand near thumb "to strengthen it."
109.....	Large spot on back of right hand "for strength." Spot beside right nostril, another on chin.
112.....	Name and address in Arabic on inner right forearm. Pigeon on branch on inner right forearm.
113.....	Three spots and rayed sun on outer right forearm. Girl on inner right forearm.
114.....	Name in Arabic on inner right forearm. Fish on back of right hand and three spots in triangle on each side of a seven-rayed sun.
115.....	Snake and crossed fish on back of right hand; this is called <u>arus</u> . Three spots in triangle on inner right forearm.
117.....	Bird on each temple. Fish, sun, and treelike branches on inner right forearm. Line and v's on back of right hand.
118.....	Bird on each temple. Fish on inner right forearm.
119.....	Three spots on back of each wrist. Sun and glove design on back of left hand.
120.....	Pigeon on each temple. Spot on back of right hand.

No.	Tattooed Design and Purpose
121.....	Fish, lion, and girl on inner right forearm. Lion and branches on right hand.
122.....	Spot and circle on inner right forearm. Three spots in a triangle on each side of a seven-rayed sun. Spot on inner left forearm. Line across back of left wrist.
123.....	Sun and three spots on back of right wrist. Spot on back of left hand.
124.....	Three girls and two fish on inner right forearm. Tree with two lines on sternum.
126.....	Three spots in triangle on back of right hand.
127.....	Three spots on back of right arm near wrist. Spot beside right nostril. Spot on chin.
128.....	Spot and line with three bars on back of right wrist.
130.....	Six lines on each temple. Two lines and tree on inner right forearm. Three spots in triangle on each side of sun on outer right forearm. Line with nine bars and six v's on right wrist leading to middle finger.
131.....	Name and address in Arabic on inner right forearm.
132.....	Three spots in triangle on each side of sun on back of right wrist.
133.....	Spot above glabella near hairline.
134.....	Cross fourchée on inner right arm.
135.....	Bird on each temple. Three spots in triangle on outside of right forearm. Lines on left wrist.
136.....	Three spots in triangle on back of right hand.
137.....	Tree, sun, and three spots on outside right forearm with rectangle enclosing wheel in center. Tree on back of right hand.
141.....	Three spots on each side of six-rayed sun on back of right wrist.
143.....	Spot on right wrist.
144.....	Three spots in triangle on back of right wrist.

Nô.	Tattooed Design and Purpose
145.....	Three spots in triangle on back of right wrist.
146.....	Three spots in triangle on back of right wrist.
148.....	Bird on each temple.
149.....	Sun and three spots arranged in triangle on back of right wrist. Pigeon on each temple. Spot beside right nostril. Spot on chin.
155.....	Pigeon on each temple.
156.....	Pigeon on each temple. Three spots in triangle on back of right forearm.
159.....	Three spots on each side of six-rayed sun on back of right wrist.
160.....	Three spots above glabella; done while a child.
162.....	Name and address in Arabic on right forearm. Three spots on back of right wrist "to relieve pain." Glove design on back of right hand.
164.....	Pigeon on each temple. Name and address in Arabic on inner right forearm.
165.....	Pigeon on each temple. Two spots on back of right wrist "to relieve pain."
169.....	Pigeon on each temple. Name and address in Arabic on inner right forearm.
170.....	Pigeon on each temple. Fish on back of right hand.
171.....	Pigeon on each temple. Elaborate glove on back of right hand.
172.....	Three spots on each side of six-rayed sun and elaborate glove on back of right hand. Girl carrying rifle on inner right forearm. Three spots on each side of seven-rayed sun below left thumb.
177.....	Name and address in Arabic on inner left forearm.
180.....	Three spots on each side of five-rayed sun on back of right wrist.
181.....	Spot above glabella near hairline.
182.....	Pigeon on each temple.
183.....	Three spots in triangle on back of right wrist. Three spots on base of right thumb. Tree on back of right hand.

No.	Tattooed Design and Purpose
186.....	Bird on each temple.
188.....	Three spots in triangle on back of right wrist.
189.....	Spot on chin. Spot beside right nostril.
190.....	Pigeon on each temple.

Henna. -- Nos. 40 and 73 had applied henna to the palms of the hands "to harden them"; No. 87 "for a festival"; and Nos. 149 and 163 "because of their recent marriage."

Negroid. -- Nos. 19, 57, 63, 76, 85, 86, 95, 99, and 101.

Drug Addict. -- No. 42.

Miscellanea. -- No. 7 wore a small brass ring in his left ear "for beauty," put in by his mother during childhood. No. 127 had a brass ring through the right ear "to cure headache." No. 107 wore a chain on back of right wrist, placed there when a child.

Summary. -- The average villager of Tamiya had dark-brown hair with low waves and medium in texture. The eyes were dark brown with a clear iris. The nasal profile was highly variable, the largest group being straight. The occlusion was normal, and the general condition and degree of wear were also normal for a group of this size. The general health and musculature were average.

STATISTICAL ANALYSES OF TAMIYA FELLAHIN

Stature. -- About half the group were medium in stature, with one-third in the tall category. The mean was 167.46, range 153-182. The mean is slightly higher than the general average for Southwestern Asia and considerably lower than the five fellahin measured at Giza by Chantre.

STATURE

Harvard System	No.	Per cent
Short (x-160.5).....	20	14.49
Medium (160.6-169.4).....	67	48.55
Tall (169.5-x).....	51	36.96
Total.....	138	100.00

STATURE

Keith System	No.	Per cent
Short (x-159.9).....	15	10.87
Medium (160.0-169.9).....	73	52.90
Tall (170.0-179.9).....	44	31.88
Very tall (180.0-x).....	6	4.35
Total.....	138	100.00

Sitting Height (Trunk Length). -- About half the group possessed medium long (85.0-89.9) trunks, and one-quarter had long (90.0-x) trunks. The mean was 87.37, which is slightly higher than two groups from Sharqiya.

SITTING HEIGHT (TRUNK LENGTH)

Group	No.	Per cent
Very short (x-74.9).....	0	....
Short (75.0-79.9).....	2	1.49
Medium (80.0-84.9).....	24	17.91
Long (85.0-89.9).....	74	55.23
Very long (90.0-x).....	34	25.37
Total.....	134	100.00

Special Observations. -- In the following series a very limited number of individuals was recorded. These observations were made by members of the nutritional unit, who will publish the complete study.

Observation	Individuals	Mean	Range
Mean Temperature...	17	37.03° C. (96.65° F.)	36.2-38.9° C. (97.16-102.02° F.)
Pulse Rate.....	17	76.35	65-90
Respiration.....	17	26.59	20-37
Chest Exhalation...	16	86.41	80-97
Chest Inhalation...	16	90.53	81-101

Minimum Frontal Diameter. -- Most heads were wide (100-119) or very wide (120-x), there being only three in the narrow category. The mean was 117.26 (range 108-135), which was the widest recorded among the comparative series. Since my four series are higher than all the others, it is possible that the other observers pressed harder with the calipers on the external frontal crests.

MINIMUM FRONTAL DIAMETER

Group	No.	Per cent
Very narrow (x-99).....	0	....
Narrow (100-109).....	3	1.66
Wide (110-119).....	126	69.61
Very wide (120-x).....	<u>52</u>	<u>28.73</u>
Total.....	181	100.00

Head Breadth. -- The majority of the heads were wide (140-149), the next largest groups were narrow (130-139). The mean was 142.33 (range 129-156), which was about the middle of the comparative series.

HEAD BREADTH

Group	No.	Per cent
Very narrow (120-129).....	1	0.55
Narrow (130-139).....	52	28.42
Wide (140-149).....	119	65.03
Very wide (150-x).....	<u>11</u>	<u>6.01</u>
Total.....	183	100.01

Cephalic Index. -- The majority were dolichocephalic, with about one-third in the mesocephalic category. The Keith classificatory system reveals the groupings masked in the Harvard system. The mean was 74.91 (range 62-84), which falls in the upper part of the comparative table.

CEPHALIC INDEX

Harvard System	No.	Per cent
Dolichocephalic (x-76.5).....	127	69.40
Mesocephalic (76.6-82.5).....	53	28.96
Brachycephalic (82.6-x).....	<u>3</u>	<u>1.64</u>
Total.....	183	100.00

CEPHALIC INDEX

Keith System	No.	Per cent
Ultradolichocephalic (x-70.0).....	18	9.84
Dolichocephalic (70.1-75.0).....	89	48.63
Mesocephalic (75.1-79.9).....	61	33.33
Brachycephalic (80.0-84.9).....	15	8.20
Ultrabrachycephalic (85.0-x).....	0	.....
Total.....	183	100.00

Facial Measurements and Indices. -- The upper part of the face tended to be long or very long (71.35 per cent). The mean was 72.20, range 60-88.

The total facial length was medium long or long (59.14 per cent). The mean was 121.15, range 99-138.

The grouping of the total facial indices places about half the series in the leptoprosopic category. The mean was 89.45, range 71-113.

FACIAL MEASUREMENTS

Upper Facial Height	No.	Per cent
Short (x-63).....	10	5.41
Medium short (64-69).....	43	23.24
Medium long (70-75).....	88	47.57
Long (76-x).....	44	23.78
Total.....	185	100.00

Total Facial Height	No.	Per cent
Short (x-109).....	9	4.84
Medium short (110-119).....	67	36.02
Medium long (120-129).....	89	47.85
Long (130-x).....	21	11.29
Total.....	186	100.00

TOTAL FACIAL INDEX

Group	No.	Per cent
Euryprosopic (x-84.5).....	35	18.82
Mesoprosopic (84.6-89.4).....	61	32.80
Leptoprosopic (89.5-x).....	90	48.39
Total.....	186	100.01

Nasal Measurements and Indices. -- The Tamiya villagers possessed noses medium in height, medium wide in breadth, and a leptorrhine or mesorrhine index. The mean height was 55.30 (range 46-68), the breadth 37.28 (range 29-46), and the nasal index 67.30 (range 48-92). Nine men were Negroid.

NASAL MEASUREMENTS

Nasal Height	No.	Per cent
Short (x-49).....	13	6.99
Medium (50-59).....	143	76.88
Long (60-x).....	<u>30</u>	<u>16.13</u>
Total.....	186	100.00

Nasal Breadth	No.	Per cent
Very narrow (x-29).....	2	1.08
Medium narrow (30-35).....	59	31.72
Medium wide (36-41).....	107	57.53
Wide (42-x).....	<u>18</u>	<u>9.68</u>
Total.....	186	100.01

NASAL INDEX

Group	No.	Per cent
Leptorrhine (x-67.4).....	107	57.53
Messorrhine (67.5-83.4).....	71	38.17
Platyrrhine (83.5-x).....	<u>8</u>	<u>4.30</u>
Total.....	186	100.00

To furnish additional statistical data for comparison with my published figures from Southwestern Asia, the following tables have been calculated:

TAMIYA FELLAHIN

Bisymmetric Breadth

Total Facial Height	x-124 No.	125-134 No.	135-x No.	Totals No.
x-114.....	1 0.54	15 8.06	7 3.76	23 12.37
115-124.....	5 2.69	41 22.04	65 34.95	111 59.68
125-x.....	0 0	15 8.06	37 19.89	52 27.96
Totals				186 100.01

Totals	186	100.01
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Nasal Width

Nasal Length	x-29		30-35		36-41		42-x		Totals	
	No.	%	No.	%	No.	%	No.	%	No.	%
x-49.....	1	0.54	4	2.15	7	3.76	2	1.08	14	7.53
50-59.....	0	0	48	25.81	82	44.09	12	6.45	142	76.34
60-x.....	1	0.54	7	3.76	18	9.68	4	2.15	30	16.13

Totals	186	100.00
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Upper Facial Height

	x-63		64-69		70-75		76-81		82-x		Totals	
Total Facial Length	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
x-109.....	4	2.16	4	2.16	1	0.54	0	0	0	0	9	4.86
110-119.....	6	3.24	27	14.59	30	16.22	3	1.62	0	0	66	35.68
120-129.....	0	0	12	6.49	54	29.19	20	10.81	3	1.62	89	48.11
130-x.....	0	0	0	0	3	1.62	12	6.49	6	3.24	21	11.35

Totals	185	100.00
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Sitting Height

Stature	900-x		899-850		849-800		799-750		749-x		Totals	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1800-x.....	5	3.73	1	0.75	0	0	0	0	0	0	6	4.48
1799-1700.....	18	13.43	24	17.91	0	0	0	0	0	0	42	31.34
1699-1600.....	11	8.21	45	33.58	15	11.19	0	0	0	0	71	52.99
x-1599.....	0	0	4	2.99	9	6.72	2	1.49	0	0	15	11.19

Totals	134	100.00
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Minimum Frontal Diameter

Head Breadth	x-99		100-109		110-119		120-x		Totals	
	No.	%	No.	%	No.	%	No.	%	No.	%
120-129.....	0	0	1	0.56	0	0	0	0	1	0.56
130-139.....	0	0	2	1.11	43	23.89	6	3.33	51	28.33
140-149.....	0	0	0	0	75	41.67	42	23.33	117	65.00
150-x.....	0	0	0	0	3	1.67	8	4.44	11	6.11

Totals	180	100.00
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MEASUREMENTS AND INDICES OF TAMIYA FILLARIN

Measurement	No.	Range	Mean	S. D.	C. V.
Age.....	189	18-90	31.30 ± .64	13.05 ± .45	41.69 ± 1.45
Stature.....	137	153-182	167.46 ± .37	6.45 ± .26	3.85 ± .16
Sitting height.....	136	79-99	87.37 ± .21	3.57 ± .15	4.09 ± .17
Head breadth.....	183	129-156	142.33 ± .24	4.83 ± .17	3.39 ± .12
Head length.....	181	174-206	189.81 ± .34	6.81 ± .24	3.99 ± .13
Minimum frontal diameter.....	181	108-135	117.26 ± .22	4.28 ± .15	3.65 ± .13
Bisygomatic diameter.....	186	111-152	135.95 ± .30	6.15 ± .22	4.52 ± .16
Bigonial diameter.....	185	105-136	118.03 ± .22	4.44 ± .16	3.76 ± .13
Total facial height.....	186	99-138	121.15 ± .34	6.85 ± .24	5.65 ± .20
Upper facial height.....	185	60-88	72.20 ± .26	5.25 ± .18	7.27 ± .26
Nasal height.....	186	46-68	55.30 ± .21	4.28 ± .15	7.74 ± .27
Nasal breadth.....	186	29-46	37.28 ± .17	3.42 ± .12	9.17 ± .32
Nose length.....	185	50-77	60.27 ± .24	4.89 ± .17	8.11 ± .28
Ear breadth.....	185	29-46	36.35 ± .14	2.88 ± .10	7.92 ± .28

Indices

Relative sitting height.....	135	49-59	52.32 ± .11	1.82 ± .07	3.48 ± .14
Cephalic.....	183	62-84	74.91 ± .17	3.42 ± .12	4.57 ± .16
Fronto-parietal.....	178	73-98	82.39 ± .15	2.94 ± .11	3.57 ± .13
Zygo-frontal.....	180	78-98	86.30 ± .16	3.08 ± .11	3.57 ± .13
Zygo-gonial.....	184	78-102	89.62 ± .18	3.60 ± .13	4.02 ± .14
Total facial.....	186	71-113	89.45 ± .28	5.70 ± .20	6.37 ± .22
Upper facial.....	185	43-65	53.33 ± .19	3.84 ± .13	7.20 ± .25
Nasal.....	186	48-92	67.30 ± .38	7.60 ± .26	11.29 ± .40
Nose.....	185	48-71	60.31 ± .22	4.50 ± .16	7.46 ± .26
Cephalo-facial.....	183	81-108	95.72 ± .18	3.66 ± .13	3.82 ± .13
Fronto-gonial.....	181	86-114	100.20 ± .26	5.25 ± .18	5.24 ± .19

SUMMARY

The average villager of Tamiya is medium to tall in stature, long or very long in trunk length. He possesses a wide or very wide forehead; a wide or narrow head; dolichocephalic or mesocephalic index; medium long to long upper facial height; medium long or medium short total facial height with a leptoprosopic or mesoprosopic index; a nose medium in length, medium wide in breadth and a leptorrhine or mesorrhine index.

TAMIYA TO FIDIMIN

At Tamiya we visited Dr. Salah ed-Din to make plans for anthropometric work on the morning of December 5. Shortly thereafter we left for Sinnuris, driving over the flat, fertile plain almost due west. The sun was bright, the sky almost cloudless.

Several miles along this road we saw a pigeon tower (burg el-hammam) on whose southern exposure rested a hundred or more blue-and-white pigeons. This was on the western outskirts of Jalal Ibrahim Beni Utman, slightly more than a mile east of Sinnuris. The owner of this property, dressed in a blue robe and wearing a white

turban, came forward through the waving wheat to greet us. A key was brought so that the small, meter-high wooden door on the southern face could be opened to us. Inside, as soon as our eyes became light-accustomed, we could see the gallant array of circular pigeon nests extending in rows to the highest part of the towers. There were three inner double banks of nesting boxes, and with the six towers, each open to the infinitely blue sky, there was room for 6,000 pigeons to nest simultaneously (See Field, 1950).

Our inspection over, we drove on to Sinnuris to call on the headmaster of the large school. Here I requested data on the geography of the Faiyum, but was informed that such a study does not exist.

On February 12, 1948, in the company of Lieutenant Saleh of the Faiyum Police, Charles D. Evans and I drove to Fidimin by way of Sinnuris, Tirsā, and Sanhur. At the Police Post we were met by Lieutenant Hassan el-Magid.

In the courtyard of the Police Post of Fidimin a group of rather miserable-looking men, women, and children were huddled on the ground. These were the family of a man suspected of having cholera; here they would be segregated until the final medical report. Such precautions were then in force throughout the Faiyum.

We were then guided by Lieutenant Hassan through Fidimin, a beautiful village graced by waving palm trees and rich black soil. We caught glimpses of orange, lime, and ancient olive trees. The villagers looked well-fed, and on all sides there was an air of plenty -- a rare, intangible quality in an Arab village or town.

We drove on a few miles to El Siliyin, where we stopped above a small stream over which stood a well-constructed mud house, the local mill (tahuna). The roaring water and the hum of machinery interfered with the customary village sounds at twilight. We walked down the steep slope. The water was pouring through two narrow concrete millraces into the lower level of the building. Inside, two large millstones were spinning at high speed. A woman sat on the ground behind each millstone (rahaya) scraping the ground flour into a metal container. Above her the maize poured through a wooden trough (korafa) into a metal funnel leading into the center of the large millstone.

According to the owner of the mill, each woman brought her own maize and carried home the flour (daqiq). The charge was one piastre for each metal container (kayala), with a capacity of about ten okes (= 27.5 lbs.). This mill was about eighty years old and had for a long time been in continuous operation day and night. We obtained samples of the maize and flour.

At Beni Saleh near Fidimin we stopped near a road gang to measure fifteen men. Plans were made to return to make a sample of the population of Fidimin.

Later we visited Ain el-Siliyin, where women and girls were carrying their empty water jars down to a concrete basin into which flowed a stream of crystal-clear water. This water, which is reported to be similar to that from Vichy and Karlsbad, is supplied to the king whenever he comes to the Faiyum. He has purchased two feddans around this spring and had it planted with gardens.

In looking through the accounts of early travelers I found a passage from Lenoir (pp. 118-129) in which he describes his visit in 1872 to Fidimin. The richness of the vegetation and the beauty of the springs captured his imagination. The sheikh observed that visitors were rare, the last having come five years before. Lenoir comments on the fine physique of the inhabitants, although eye diseases were common. He describes the local growing of rice, wheat, maize, sugar cane, oranges, and many other kinds of fruit.

On February 13 I returned to spend the night at the police post so that I could start early on the following morning to record anthropometric data on a large series in Fidimin. The following day I measured 291 men in twelve hours.

FELLAHIN MEASURED AT FIDIMIN

At Beni Saleh, near Fidimin, fifteen men were measured on February 12. Two days later 291 men were measured in Fidimin.

Age. -- The average age for 306 men was 35.35 (range 18-80). One-third of this series was less than thirty, and one-third in the 30-39 age group. It was difficult to persuade the older men to submit to the calipers.

AGE DISTRIBUTION

Age	No.	Per cent	Age	No.	Per cent
18-19.....	11	3.59	50-54.....	25	8.17
20-24.....	43	14.05	55-59.....	5	1.63
25-29.....	62	20.26	60-64.....	11	3.59
30-34.....	56	18.30	65-69.....	0	.....
35-39.....	47	15.36	70-74.....	4	1.31
40-44.....	25	8.17	75-79.....	0	.....
45-49.....	15	4.90	80-84.....	2	0.65
			Total....	306	99.99

MORPHOLOGICAL CHARACTERS OF FIDIMIN FELLAHIN

Skin. -- The skin tended to be lighter in color than the Tamiya villagers. No differences in grouping were observed in the skin color of the forehead or in that of the inner surface of the right arm.⁶ Of the 41 individuals recorded, the majority were brunet (23), the remainder being pale (8), swarthy (6), dark brown (3), and pink (1). The excellent climate, good water supply, abundant fresh fruit, and lack of exposure prevented any weather-beaten appearance. Furthermore, the number of sallow complexions observed among the crowd indicated relatively little exposure to the sun, because most of the villagers spend their time indoors or in the abundant shade. Many of the natives of Fidimin have similar skin colors to those of central Europeans or northern Italians. Three men (Nos. 291, 305, and 306) had light skins. Two men (Nos. 28 and 35) possessed yellowish skins.

Freckles. -- These were recorded as absent (14), some (16), plus (3), double plus (1), and massed (1).

Moles. -- These were observed as absent (14), few (18), and many (1).

Hair. -- The hair was dark brown, with one reddish-brown exception. The beard or mustache was recorded in similar categories. In form, the hair had low or deep waves, with one curly-haired man. The texture was medium. My impression is that these percentages would pertain to the entire group measured and that the average Fidimini would possess dark brown, low-wavy hair of medium texture.

HAIR

Color	No.	Per cent
Dark brown.....	33	86.84
Reddish brown.....	1	2.63
White.....	<u>4</u>	<u>10.53</u>
Total.....	38	100.00

Form	No.	Per cent
Low waves.....	27	75.00
Deep waves.....	8	22.22
Curly.....	<u>1</u>	<u>2.78</u>
Total.....	36	100.00

Texture	No.	Per cent
Coarse.....	1	2.70
Medium.....	32	86.49
Fine.....	<u>4</u>	<u>10.81</u>
Total.....	37	100.00

Head-hair quantity was recorded as slight (9), average (22), and double plus (2). Baldness was absent (19), slight (6), plus (4), and double plus (3). Head-hair grayness was absent (23), some (10), plus (3), and double plus (3). Body hair was absent (24), some (2), plus (4), and double plus (0). Beard quantity was observed as very light (11), some (7), plus (9), and double plus (6). Beard grayness was absent (24), some (8), plus (4), and double plus (1).

Eyes. -- The majority of the eyes were dark brown, but the two men with green-brown and blue-brown (1) eyes indicate submerged blondism, a character observed throughout the village. The iris tended to be clear.

The eyes, or more properly the eye slits, were horizontal as in Europeans. However, Nos. 25 and 28 were slightly Mongoloid.

EYES

Color	No.	Per cent
Dark brown.....	35	92.11
Blue-brown.....	1	2.63
Green-brown.....	<u>2</u>	<u>5.26</u>
Total.....	38	100.00

Iris	No.	Per cent
Clear.....	27	71.05
Rayed.....	1	2.63
Zoned.....	3	7.89
Spotted.....	<u>7</u>	<u>18.42</u>
Total.....	38	99.99

No. 35 had blue-ringed sclera. No. 34 had only one-third vision in his right eye. No. 306 was blind in the left eye.

Eye-brow Concurrence. -- This was observed as absent (4), some (17), average (17), and double plus (0).

Brow-ridges. -- The majority (27) were average, with three in the small and very small categories.

Ears. -- The lobe was soldered (3) or attached (34). The size was small (6), average (21), and large (10). The protrusion was small (1), average (34), and double plus (2).

Nose. -- In profile the noses showed considerable variation, the majority being convex. The alae also varied considerably, the majority being of medium thickness. No. 38 had a broad (47) nose but did not appear Negroid. The nasal tip thickness was recorded as small (14), average (21), double plus (1), and triple plus (2).

NOSE

Profile	No.	Per cent
Wavy.....	16	5.26
Concave.....	27	8.88
Straight.....	95	31.25
Convex.....	<u>166</u>	<u>54.61</u>
Total.....	304	100.00

NOSE

Wings	No.	Per cent
Compressed.....	11	28.95
Medium.....	21	55.26
Flaring.....	<u>6</u>	<u>15.79</u>
Total.....	38	100.00

Mouth. -- The integumental thickness of the lips was average (19), with some eversion (10) and marked (6) lip eversion.

Teeth. -- The occlusion was normal slight-over for more than three-quarters of the small series recorded. Wear appears to have been abnormally high, but the number lost was small. Eruption was recorded as complete (13), but none in the partial category. Crowding was absent (29), but two men were recorded as plus and three in the double plus group. My general impression was that the teeth were average to good.

TEETH

Bite	No.	Per cent
Under.....	0	.....
Edge-to-edge.....	1	2.70
Slight over.....	29	78.37
Marked over.....	<u>7</u>	<u>18.92</u>
Total.....	37	99.99

Loss	No.	Per cent
None.....	14	36.84
Few.....	12	31.58
Some.....	5	13.16
Plus.....	6	15.79
Double plus.....	<u>1</u>	<u>2.63</u>
Total.....	38	100.00

Wear	No.	Per cent
Absent, some.....	15	39.47
Plus.....	6	15.79
Double plus, triple plus....	<u>17</u>	<u>44.74</u>
Total.....	38	100.00

No. 24 (age 42) had very bad teeth. No. 36 (age 50) had lost all upper teeth. No. 38 (age 60) had bad teeth, many (17+) being lost, which he attributed to eating many Siwi dates.

Musculature. -- In general this was average to good, although no statistics were recorded.

Health. -- No data were recorded on each individual, but the Fidiminis appeared to be in better health than any village visited in the Faiyum. This is undoubtedly the result of abundant citrus products, good water, and a relatively high standard of living.

Disease. -- No. 20 had skin eruptions on his face. Nos. 12 and 304 bore scars from smallpox contracted during childhood. No. 36 (age 50) had very shaky hands. No. 5 complained of rheumatism and wore a ring in each ear lobe "to relieve the pain." Wens were observed on the left forehead of No. 12 and on the right temple of No. 37.

Branding Scars. -- None were observed.

Tattooing. -- A bird was tattooed on each temple of Nos. 30, 33, 291, 299, and 301. No. 5 had an elaborate tree design on the back of the right hand, which had been tattooed in the capital, Medinet el-Faiyum. No. 12 had four spots and two lines on each side of the forehead and a wen on the left side. No. 21 had an elaborate glove design on the back of the right hand. No. 25 had three vertical lines on each temple. No. 37 had a spot above the glabella and another on a wen on the right temple. No. 295 had three spots arranged in an equilateral triangle on each temple.

Kohl. -- No evidence of its use was observed among the men.

Mongoloid. -- Nos. 25 and 28 were slightly Mongoloid.

Summary. -- The average Fidimini was light medium brown in color with dark brown, low-wavy hair of medium texture. The eyes were dark brown with clear irises. The nasal profile was convex or straight with medium to compressed wings. The teeth showed normal occlusion and rather unusual wear. The musculature and health were good.

Circumstances prevented my recording in full the usual observations, but my general impression is that the trends shown would be revealed in a large series from the Fidimin area.

STATISTICAL ANALYSES OF FIDIMIN FELLAHIN

Stature. -- Not recorded.

Minimum Frontal Diameter. -- The forehead was wide (110-119) in 74.84 per cent of the subjects with 7.84 per cent in the very wide category. The mean was 113.66 (range 98-133).

MINIMUM FRONTAL DIAMETER

Group	No.	Per cent
Very narrow (x-99).....	1	0.33
Narrow (100-109).....	52	16.99
Wide (110-119).....	229	74.84
Very wide (120-x).....	<u>24</u>	<u>7.84</u>
Total.....	306	100.00

Head Measurements. -- The mean head length was 191.31 (range 167-210). The mean head breadth was 139.27 (range 110-152). The group was almost divided equally between wide and narrow heads.

HEAD BREADTH

Group	No.	Per cent
Very narrow (110-129).....	12	3.92
Narrow (130-139).....	134	43.79
Wide (140-149).....	154	50.33
Very wide (150-x).....	<u>6</u>	<u>1.96</u>
Total.....	306	100.00

Cephalic Index. -- The mean was 73.05 (range 58-99). With only eight exceptions (2.62 per cent) the entire series falls within the mesocephalic-ultraccephalic group according to the Keith fivefold classificatory system. There is a high percentage (12.42 per cent) of ultra-dolichocephals (x-70.0).

CEPHALIC INDEX

Harvard System	No.	Per cent
Dolichocephalic (x-76.5).....	266	86.93
Mesocephalic (76.6-82.5).....	39	12.75
Brachycephalic (82.6-x).....	<u>1</u>	<u>0.33</u>
Total.....	306	100.01

Keith System	No.	Per cent
Ultradolichocephalic (x-70.0).....	38	12.42
Dolichocephalic (70.1-75.0).....	174	56.86
Mesocephalic (75.1-79.9).....	86	28.10
Brachycephalic (80.0-84.9).....	7	2.29
Ultrabrachycephalic (85.0-x).....	<u>1</u>	<u>0.33</u>
Total.....	306	100.00

Facial Measurements and Indices. -- The mean upper facial height was 74.45 (range 60-92), the total facial height 122.5 (range 100-142), and the total facial index 91.25 (range 54-106). The upper face was either long or medium, and the total face was medium long to long (120-x); but almost one-third of the Fidiminis possessed medium-short (110-119) faces. The total facial index was leptoprosopic, but 28.52 per cent were mesoprosopic and 9.84 per cent euryprosopic.

FACIAL MEASUREMENTS

Upper Facial Height	No.	Per cent
Short (x-63).....	6	1.97
Medium short (64-69).....	49	16.07
Medium long (70-75).....	96	31.48
Long (76-x).....	<u>154</u>	<u>50.49</u>
Total.....	305	100.01

Total Facial Height	No.	Per cent
Short (x-109).....	10	3.28
Medium short (110-119).....	95	31.15
Medium long (120-129).....	154	50.49
Long (130-x).....	<u>46</u>	<u>15.08</u>
Total.....	305	100.00

TOTAL FACIAL INDEX

Group	No.	Per cent
Euryprosopic (x-84.5).....	30	9.84
Mesoprosopic (84.6-89.4).....	87	28.52
Leptoprosopic (89.5-x).....	<u>188</u>	<u>61.64</u>
Total.....	305	100.00

Nasal Measurements and Indices. -- The mean nasal height was 57.49 (range 31-89), the breadth 37.58 (range 30-63), and the index 65.58 (range 38-86). The nose was medium in height and medium in width with a leptorrhine index.

NASAL MEASUREMENTS

Nasal Height	No.	Per cent
Short (x-49).....	13	4.26
Medium (50-59).....	194	63.61
Long (60-x).....	<u>98</u>	<u>32.13</u>
Total.....	305	100.00

Nasal Breadth	No.	Per cent
Very narrow (x-29).....	0	.....
Medium narrow (30-35).....	63	20.66
Medium wide (36-41).....	208	68.20
Wide (42-x).....	<u>34</u>	<u>11.15</u>
Total.....	305	100.01

NASAL INDEX

Group	No.	Per cent
Leptorrhine (x-67.4).....	183	60.00
Mesorrhine (67.5-83.4).....	117	38.36
Platyrrhine (83.5-x).....	<u>5</u>	<u>1.64</u>
Total.....	305	100.00

To furnish additional statistical data for comparison with my previously published figures from Southwestern Asia, the following tables have been calculated:

FIDIMIN FELLAHIN

Minimum Frontal Diameter

Head Breadth	x-99 No. %	100-109 No. %	110-119 No. %	120-x No. %	Totals No. %
120-129.....	0 0	7 2.31	4 1.32	0 0	11 3.63
130-139.....	0 0	38 12.54	94 31.02	1 0.33	133 43.89
140-149.....	0 0	7 2.31	127 41.91	20 6.60	154 50.83
150-x.....	0 0	0 0	4 1.32	1 0.33	5 1.65
Totals.....					303 100.00

Bisygomatic Breadth

Total Facial Length	x-124 No. %	125-134 No. %	135-x No. %	Totals No. %
x-114.....	2 0.66	24 7.87	11 3.61	37 12.13
115-124.....	4 1.31	69 22.62	73 23.93	146 47.87
125-x.....	2 0.66	41 13.44	79 25.90	122 40.00
Totals.....				305 100.00

Upper Facial Length

Total Facial Length	x-63 No. %	64-69 No. %	70-75 No. %	76-81 No. %	82-x No. %	Totals No. %
x-109.....	1 0.33	6 1.97	3 0.98	0 0	0 0	10 3.28
110-119.....	4 1.31	28 9.18	50 16.39	13 4.26	0 0	95 31.15
120-129.....	1 0.33	13 4.26	57 18.69	70 22.95	13 4.26	154 50.49
130-x.....	0 0	2 0.66	11 3.61	18 5.90	15 4.92	46 15.08
Totals.....						305 100.00

Nasal Width

Nasal Length	x-29 No. %	30-35 No. %	36-41 No. %	42-x No. %	Totals No. %
x-49.....	0 0	5 1.65	7 2.31	1 0.33	13 4.29
50-59.....	0 0	41 13.53	135 44.55	16 5.28	192 63.37
60-x.....	0 0	17 5.61	65 21.45	16 5.28	98 32.34
Totals.....					303 100.00

MEASUREMENTS AND INDICES OF FIDIMIN FELLAHIN

Measurements	No.	Range	Mean	S. D.	C. V.
Age.....	306	18-80	35.35 ± .47	12.30 ± .34	34.79 ± .95
Stature.....	not recorded				
Head length.....	306	167-210	191.31 ± .25	6.45 ± .18	3.37 ± .09
Head breadth.....	305	110-152	139.27 ± .22	5.58 ± .16	4.01 ± .11
Minimum frontal diameter.....	306	98-133	113.66 ± .18	4.56 ± .12	4.01 ± .11
Bisygomatic diameter.....	306	121-147	134.65 ± .20	5.10 ± .14	3.79 ± .10
Bigonial diameter.....	281	97-132	113.10 ± .25	6.16 ± .18	5.45 ± .16
Total facial height.....	305	100-142	122.55 ± .28	7.25 ± .20	5.92 ± .16
Upper facial height.....	305	60-92	74.45 ± .21	5.35 ± .15	7.19 ± .20
Nasal height.....	305	31-89	57.49 ± .20	5.16 ± .14	8.98 ± .24
Nasal breadth.....	305	30-63	37.58 ± .13	3.30 ± .09	8.78 ± .24
Nar length.....	38	56-88	64.65 ± .62	5.65 ± .44	8.74 ± .67
Nar breadth.....	38	32-44	37.41 ± .29	2.64 ± .20	7.06 ± .55
Indices					
Cephalic.....	306	58-99	73.05 ± .15	3.80 ± .10	5.20 ± .14
Fronto-parietal.....	305	62-94	81.61 ± .14	3.60 ± .10	4.41 ± .12
Zygo-frontal.....	306	77-98	84.58 ± .11	2.92 ± .08	3.45 ± .09
Zygo-gonial.....	281	75-96	84.43 ± .15	3.63 ± .10	4.30 ± .12
Total facial.....	305	54-106	91.15 ± .22	5.85 ± .16	6.42 ± .18
Upper facial.....	305	43-69	55.40 ± .16	4.02 ± .11	7.26 ± .20
Nasal.....	304	38-86	65.58 ± .28	7.16 ± .20	9.18 ± .25
Nar.....	38	45-70	57.90 ± .36	3.25 ± .25	5.61 ± .43
Cephalo-facial.....	305	70-109	96.35 ± .17	4.38 ± .12	4.54 ± .12
Fronto-gonial.....	281	87-113	99.63 ± .19	4.70 ± .13	4.72 ± .13

SUMMARY

The average villager of Fidimin possesses a wide forehead, a wide or narrow head, dolichocephalic index, long or medium long upper facial height, medium long total facial height with a leptoprosopic index, a nose medium in height, medium in breadth, and a leptorrhine index.

COMPARATIVE DATA

In this section selected anthropometric data⁷ on the modern Egyptians and a few series from North Africa have been tabulated for comparison with my published⁸ statistical tables, which will now link the measurements and indices on modern peoples from Egypt to the Caucasus.⁹

Attention should be paid to the fact that Craig used nasion-occipital instead of glabella-occipital length. Thus, the mean head length is rather less and the mean cephalic index is rather greater than they would have been if our technique had been employed.

The 369 Moslem soldiers measured by Myers came from Qena, Girga, Giza, Dakahlia, Beheira, and Sharqiya.

Mitwally has measured 400 Nubians (as yet unpublished).

STATURE

Group	Location	No.	Stature	Observer
Haweitat	Matarieh	8	162.0	Chantre
Fellahin	Baiadie			
	and Zeinie	4	162.0	Chantre
Fellahin	Egypt	138	163.0	Chantre
Farafra	Oasis	51	163.7	Mitwally
Kharga	Oasis	150	163.8	Hrdlička
Kharga	Oasis	205	163.9	Mitwally
Belbeis	Sharqiya	144	163.95	Ammar
Maaza	Beni Suef	...	164.0	Chantre
Baharia	Oasis	196	164.2	Mitwally
Total	Egypt	288	165.0	Chantre
Dakhla	Oasis	386	165.5	Mitwally
Fellahin	Sharqiya	516	165.54	Craig
Beduins	Sinai	67	165.72	Field
Beduins (Towara)	Sinai	63	165.8	Murray
Maaza	Qena and			
	Beni Suef	34	166.0	Chantre

STATURE				
Group	Location	No.	Stature	Observer
Maaza	Faiyum	...	166.0	Chantre
Copts	Luxor	96	166.0	Chantre
Copts	Various	31	166.0	Chantre
Copts	Egypt	150	166.0	Chantre
Towara	Sinai	18	166.0	Chantre
Fellahin	Dakahlia	...	166.06	Chantre
Fagus	Sharqiya	141	166.38	Ammar
Minieh el-Qamh	Sharqiya	128	166.38	Ammar
Fellahin	Sharqiya	939	166.52	Ammar
Sharqiya	District	51	166.52	Ammar
Zaqaziq	Sharqiya	288	166.55	Ammar
Kafr Saqr	Sharqiya	94	166.84	Ammar
Jebeliyeh	Sinai	42	167.01	Field
Hihya	Sharqiya	109	167.13	Ammar
Gharbiya	.....	...	167.33	Chantre
Tamiya	Faiyum	137	167.46	Field
Beja (Ababdeh, Barabra, Bichariet).....		223	167.6	Chantre
Beheira	.....	...	167.68	Chantre
Beduins	.....	134	167.8	Chantre
Fellahin	Luxor	58	168.0	Chantre
Fellahin	Karnak	14	168.0	Chantre
Beduins	Egypt	188	168.0	Chantre
Siwa	Oasis	219	168.0	Mitwally
Ayaideh	Menzaleh and Matarieh	25	168.0	Chantre
Fagus	Sharqiya	141	168.38	Ammar
Fellahin	.....	91	168.4	Chantre
Beduins	Western Desert	40	168.85	Murray
Fellahin	Giza	5	170.0	Chantre
Wulud Ali	Mariut	20	170.0	Chantre
Nagamah	.....	...	172.0	Chantre
Fellahin	Koraichia	10	173.0	Chantre
Harabi	Faiyum	29	173.0	Chantre

SITTING HEIGHT

Group	Location	No.	SH	Observer
Kharga	Oasis	150	84.0	Hrdlička
Minieh el-Qamh	Sharqiya	128	84.54	Ammar
Belbeis	Sharqiya	144	84.58	Ammar
Zaqaziq	Sharqiya	288	84.64	Ammar
Sharqiya	District	151	85.15	Ammar
Hihya	Sharqiya	109	85.26	Ammar

Group	SITTING HEIGHT		SH	Observer
	Location	No.		
Kafr Saqr	Sharqiya	94	86.08	Ammar
Faqus	Sharqiya	141	86.43	Ammar
Tamiya	Faiyum	136	87.37	Field

RELATIVE SITTING HEIGHT

Group	Location	No.	RSH	Observer
Minieh el-Qamh	Sharqiya	288	50.87	Ammar
Zaqaziq	Sharqiya	128	50.92	Ammar
Hihya	Sharqiya	151	51.13	Ammar
Sharqiya	District	141	51.19	Ammar
Kharga	Oasis	150	51.26	Hrdlička
Faqus	Sharqiya	94	51.37	Ammar
Kabyles	.....	184	51.4	Prengruber
Belbeis	Sharqiya	144	51.56	Ammar
Kafr Saqr	Sharqiya	109	51.60	Ammar
Tamiya	Faiyum	135	52.32	Field

HEAD LENGTH

Group	Location	No.	GOL	Observer
Fellahin	Karnak	14	186.0	Chantre
Copts	.....	150	187.0	Chantre
Kafr Saqr	Sharqiya	94	187.06	Ammar
Hihya	Sharqiya	109	187.17	Ammar
Zaqaziq	Sharqiya	288	187.53	Ammar
Belbeis	Sharqiya	144	187.57	Ammar
Minieh el-Qamh	Sharqiya	128	187.64	Ammar
Sharqiya	District	51	187.71	Ammar
Fellahin	Sharqiya	940	187.71	Ammar
Fellahin	.....	138	188.0	Chantre
Total	Egypt	288	188.0	Chantre
Copts	Luxor	96	188.0	Chantre
Faqus	Sharqiya	141	188.11	Ammar
Copts	.....	127	188.5	Chantre
Kharga	Oasis	150	189.0	Hrdlička
Tamiya	Faiyum	181	189.81	Field
Copts	Various	31	190.0	Chantre
Fellahin	Luxor	58	190.0	Chantre
Fellahin	.....	91	190.0	Chantre
Hawaitat	Matarieh	8	190.0	Chantre
Dakahlia	.....	...	190.35	Craig
Sharqiya	.....	...	190.79	Craig
Fellahin	Sharqiya	515	190.8	Craig

Group	HEAD LENGTH				Observer
	Location	No.	GOL		
Towara	Sinai	18	191.0		Chantre
Wulud Ali	Mariut	20	191.0		Chantre
Beheira	.....	...	191.16		Craig
Qena	.....	...	191.19		Craig
Beduins (Towara)	Sinai	63	191.3		Murray
Fidimin	Faiyum	306	191.31		Field
Girga	.....	...	191.51		Craig
Giza	.....	...	191.66		Craig
Beduins	.....	188	192.0		Chantre
Kharga	Oasis	225	192.0		Mitwally
Ayaideh	Menzaleh and				
	Matarieh	25	192.0		Chantre
Maaza	Qena and				
	Beni Suef	34	192.0		Chantre
Fellahin	Baiadieh and				
	Zeinieh	4	192.0		Chantre
Jebeliyeh	Sinai	73	192.15		Field
Baharia	Oasis	196	193.0		Mitwally
Farafra	Oasis	51	193.0		Mitwally
Fellahin	Koraichia	10	193.0		Chantre
Dakahlia	.....	109	193.0		Myers
Copts (soldiers)	.....	44	193.05		Myers
Beduins	Sinai	150	193.74		Field
Beduins	Western Desert	40	193.9		Murray
Fellahin	Giza	5	194.0		Chantre
Dakhla	Oasis	344	194.0		Mitwally
Girga	.....	83	194.53		Myers
Moslems (soldiers)	.....	369	194.56		Myers
Giza	.....	54	194.56		Myers
Fellahin	Faiyum	36	194.61		Myers
Qena and Girga	.....	136	194.63		Myers
Qena	.....	53	194.79		Myers
Harabi	Faiyum	29	195.0		Chantre
Menufiya	.....	91	195.69		Myers
Mixed	.....	64	195.98		Myers
Fellahin	Sharqiya	20	196.75		Myers
Siwa	Oasis	221	196.8		Mitwally
Beheira	.....	50	196.82		Myers

HEAD BREADTH

Group	Location	No.	GB	Observer
Jebeliyeh	Sinai	73	138.64	Field
Beduins (Towara)	Sinai	63	139.18	Murray
Fidimin	Faiyum	305	139.27	Field
Beduins	Sinai	150	139.72	Field
Fellahin	Karnak	14	140.0	Chantre
Towara	Sinai	18	140.0	Chantre
Baharia	Oasis	196	140.1	Mitwally
Farafra	Oasis	51	140.7	Mitwally
Total	Egypt	288	141.0	Chantre
Fellahin	Giza	5	141.0	Chantre
Hawaitat	Matarieh	8	141.0	Chantre
Copts	.....	150	141.0	Chantre
Copts	Various	31	141.0	Chantre
Kharga	Oasis	150	141.4	Hrdlička
Fellahin	.....	138	142.0	Chantre
Fellahin	Luxor	58	142.0	Chantre
Fellahin	.....	92	142.0	Chantre
Beduins	.....	188	142.0	Chantre
Copts	Luxor	96	142.0	Chantre
Copts	.....	127	142.0	Chantre
Harabi	Faiyum	29	142.0	Chantre
Girga	.....	...	142.28	Craig
Qena	.....	...	142.32	Craig
Tamiya	Faiyum	183	142.33	Field
Belbeis	Sharqiya	144	142.7	Ammar
Ayaideh	Menzaleh and			
	Matarieh	25	143.0	Chantre
Fellahin	Koraichia	10	143.0	Chantre
Copts (soldiers)	.....	44	143.09	Myers
Giza	.....	...	143.16	Craig
Minieh el-Qamh	Sharqiya	128	143.29	Ammar
Beduins	Western Desert	40	143.3	Murray
Giza	.....	54	143.41	Myers
Faiyum	.....	36	143.5	Myers
Siwa	Oasis	221	143.6	Mitwally
Beheira	.....	...	143.61	Craig
Sharqiya	.....	...	143.63	Craig
Zaqaziq	Sharqiya	288	143.75	Ammar
Sharqiya	.....	51	143.78	Ammar
Fellahin	Sharqiya	942	143.78	Ammar
Faqus	Sharqiya	141	143.8	Ammar
Qena	.....	53	143.91	Myers

Group	HEAD BREADTH		GB	Observer
	Location	No.		
Dakahlia	.....	...	143.99	Craig
Maaza	Qena and Beni Suef	34	144.0	Chantre
Wulud Ali	Mariut	20	144.0	Chantre
Qena and Girga	.....	136	144.16	Myers
Kharga	Oasis	205	144.2	Mitwally
Moslems (soldiers)	.....	369	144.29	Myers
Girga	.....	83	144.33	Myers
Kafr Saqr	.....	94	144.37	Ammar
Beheira	.....	50	144.38	Myers
Hihya	.....	109	144.45	Ammar
Dakahlia	.....	109	144.64	Myers
Dakhla	Oasis	394	144.8	Mitwally
Fellahin	Baiadieh and Zeinieh	4	145.0	Chantre
Egyptians	Various	64	145.14	Myers
Menufia	.....	93	145.16	Myers
Sharqiya	.....	20	145.4	Myers

CEPHALIC INDEX

Group	Location	No.	CI	Observer
Jebelliyeh	Sinai	73	72.24	Field
Beduins	Sinai	150	72.35	Field
Fellahin	Giza	5	72.68	Chantre
Harabi	Faiyum	29	72.82	Chantre
Beduins (Towara)	Sinai	63	72.95	Murray
Fidimin	Faiyum	306	73.05	Field
Baharia	Oasis	196	73.3	Mitwally
Towara	Sinai	18	73.3	Chantre
Beheira	.....	50	73.42	Myers
Nilotic Negroes	.....	35	73.66	Chantre
Farafra	Oasis	51	73.7	Mitwally
Beduins	Western Desert	40	73.76	Murray
Giza	.....	...	73.76	Myers
Faiyum	.....	36	73.81	Myers
Beduins	.....	134	73.9	Chantre
Sharqiya	.....	20	73.94	Myers
Qena	.....	53	73.94	Myers
Beduins	.....	165	73.96	Chantre
Copts (soldiers)	.....	44	74.0	Myers
Fellahin	Koraichia	10	74.09	Chantre
Siwa	Oasis	221	74.1	Mitwally
Egyptians	Various	64	74.1	Myers

Group	CEPHALIC INDEX		CI	Observer
	Location	No.		
Qena and Girga	.....	136	74.13	Myers
Menufia	.....	91	74.18	Myers
Haweitat	Matarieh	8	74.21	Chantre
Copts	Various	31	74.21	Chantre
Girga	.....	83	74.25	Myers
Moslems (soldiers)	.....	369	74.26	Myers
Girga	.....	...	74.38	Craig
Ayaideh	Menzaleh and			
	Matarieh	25	74.48	Chantre
Qena	.....	...	74.48	Craig
Negroes	Nubia	26	74.53	Chantre
Ababdeh	.....	81	74.6	Chantre
Fellahin	.....	91	74.7	Chantre
Fellahin	.....	127	74.7	Chantre
Fellahin	Luxor	58	74.73	Chantre
Giza	.....	...	74.75	Craig
Kharga	Oasis	205	74.8	Mitwally
Kharga	Oasis	150	74.9	Hrdlička
Tamiya	Faiyum	183	74.91	Field
Maaza	Qena and			
	Beni Suef	34	75.0	Chantre
Dakhla	Oasis	397	75.0	Mitwally
Total	Egypt	288	75.0	Chantre
Dakahlia	.....	109	75.01	Myers
Copts	.....	127	75.2	Chantre
Beheira	.....	...	75.2	Craig
Fellahin	Karnak	14	75.27	Chantre
Sharqiya	.....	...	75.39	Craig
Wulud Ali	Mariut	20	75.39	Chantre
Copts	.....	150	75.4	Chantre
Sharqiya	.....	515	75.4	Craig ¹⁰
Fellahin	Baiadiieh and			
	Zeinieh	4	75.52	Chantre
Copts	Luxor	96	75.53	Chantre
Fellahin	.....	138	75.53	Chantre
Dakahlia	.....	...	75.69	Craig
Minieh el-Qamh	.....	128	75.77	Ammar
Belbeis	.....	144	76.0	Ammar
Barabra	.....	64	76.4	Chantre
Faqus	.....	141	76.56	Ammar
Sharqiya	.....	51	76.66	Ammar
Fellahin	Sharqiya	933	76.66	Ammar
Zaqaziq	.....	288	76.74	Ammar
Hihya	.....	109	77.0	Ammar

Group	CEPHALIC INDEX			Observer
	Location	No.	CI	
Kafr Saqr	94	77.28	Ammar
Bichariet	78	79.0	Chantre

NORTH AFRICAN AND SINAI GROUPS¹¹

(after Chantre)

Group	Location	No.	CI	Observer
Arabs	Ougorla (?)	20	72.00	Elisieev ¹²
Arabs	Oran (?)	10	73.21	Bleicker
Arabs	Sinai	20	73.87	Elisieev
Arabs	Ouled Touarah	18	73.30	Chantre
Arabs	Ouled Ayaideh	41	74.48	Chantre
Arabs	Maaza	40	75.0	Chantre
Arabs	Aleppo (Alep)	22	77.05	Chantre
Berbers	Aures	10	72.0	Elisieev
Berbers	Chemini	40	72.62	Berthelon
Berbers	Menzel	53	72.69	Berthelon
Berbers	Ouled Harabi	29	72.82	Chantre
Berbers	Kroumirie	358	73.99	Berthelon
Berbers	Hama	64	74.37	Berthelon
Berbers	Djara	14	74.80	Berthelon
Berbers	Medjez el-Bab	16	75.39	Collignon
Berbers	Chaouias	15	75.60	Faidherbe
Berbers	Palestro	184	76.04	Prengrueber
Berbers	Biskra	180	76.07	Seriziat
Berbers	Mozabit	50	77.03	Amat
Berbers	Kairouan	61	77.59	Collignon
Berbers	Gerba	330	79.94	Berthelon
Ouled Nagama	.....	21	75.26	Chantre
Ouled ¹³ Aly	.....	20	75.39	Chantre
Ouled Said	.....	16	77.79	Collignon
Beoni-Maguel	Gerba	34	82.24	Berthelon
Ouled Zelofras	Gerba	11	82.50	Berthelon

MINIMUM FRONTAL DIAMETER

Group	Location	No.	MFD	Observer
Baharia	Oasis	196	101.3	Mitwally
Kharga	Oasis	100	102.6	Hrdlička
Farafra	Oasis	51	103.0	Mitwally
Siwa	Oasis	221	104.3	Mitwally
Kharga	Oasis	205	104.7	Mitwally

MINIMUM FRONTAL DIAMETER

Group	Location	No.	MFD	Observer
Belbeis	Sharqiya	144	105.0	Ammar
Dakhla	Oasis	397	105.2	Mitwally
Faqus	Sharqiya	141	105.78	Ammar
Sharqiya	District	51	106.42	Ammar
Zaqaziq	Sharqiya	288	106.61	Ammar
Kafr Saqr	Sharqiya	94	106.62	Ammar
Hihya	Sharqiya	109	106.68	Ammar
Beduins (Towara)	Sinai	63	106.85	Murray
Minieh el-Qamh	Sharqiya	128	107.35	Ammar
Beduins	Western Desert	40	109.55	Murray
Jebeliyeh	Sinai	73	113.50	Field
Fidimin	Faiyum	306	113.66	Field
Beduins	Sinai	150	113.78	Field
Tamiya	Faiyum	181	117.26	Field

BIZYGOMATIC BREADTH

Group	Location	No.	Biz. B	Observer
Hawaitat	Matarieh	8	123.0	Chantre
Kharga	Oasis	205	128.8	Mitwally
Baharia	Oasis	196	129.1	Mitwally
Beduins (Towara)	Sinai	63	129.2	Murray
Maaza	Qena and Beni Suef	34	130.0	Chantre
Belbeis	Sharqiya	144	130.69	Ammar
Beduins	Western Desert	40	130.75	Murray
Copts	.....	150	131.0	Chantre
Fellahin	.....	138	131.0	Chantre
Towara	Sinai	18	131.0	Chantre
Total	Egypt	288	131.0	Chantre
Kafr Saqr	Sharqiya	94	131.36	Ammar
Minieh el-Qamh	Sharqiya	128	131.37	Ammar
Kharga	Oasis	150	131.5	Hrdlička
Siwa	Oasis	221	131.6	Mitwally
Sharqiya	Sharqiya	51	131.84	Ammar
Fellahin	Sharqiya	943	131.84	Ammar
Faqus	Sharqiya	141	131.95	Ammar
Zaqaziq	Sharqiya	288	132.37	Ammar
Hihya	Sharqiya	109	132.5	Ammar
Beduins	Sinai	150	132.8	Field
Beduins	.....	188	133.0	Chantre
Wulud Ali	Mariut	20	133.0	Chantre
Jebeliyeh	Sinai	73	133.25	Field
Farafra	Oasis	54	133.5	Mitwally

BIZYGOMATIC BREADTH

Group	Location	No.	Biz. B	Observer
Fidimin	Faiyum	306	134.65	Field
Dakhla	Oasis	397	134.9	Mitwally
Ayaideh	Menzaleh and Matarieh	25	135.0	Chantre
Tamiya	Faiyum	186	135.95	Field
Harabi	Faiyum	29	138.0	Chantre

BIGONIAL BREADTH

Group	Location	No.	Big. B	Observer
Beduins (Towara)	Sinai	63	97.4	Murray
Beduins	Western Desert	40	101.0	Murray
Kharga	Oasis	100	102.6	Hrdlička
Fidimin	Faiyum	281	113.1	Field
Tamiya	Faiyum	185	118.03	Field

UPPER FACIAL HEIGHT

Group	Location	No.	UFH	Observer
Beduins	Western Desert	40	58.85	Murray
Beduins (Towara)	Sinai	63	60.56	Murray
Zaqaziq	Sharqiya	288	64.66	Ammar
Belbeis	Sharqiya	144	64.73	Ammar
Kafr Saqr	Sharqiya	94	65.09	Ammar
Sharqiya	Sharqiya	51	65.1	Ammar
Hihya	Sharqiya	109	65.28	Ammar
Faqus	Sharqiya	141	65.65	Ammar
Minieh el-Qamh	Sharqiya	128	65.7	Ammar
Jebeliyeh	Sinai	73	69.65	Field
Beduins	Sinai	150	70.95	Field
Tamiya	Faiyum	185	72.20	Field
Fidimin	Faiyum	305	74.45	Field

UPPER FACIAL INDEX

Group	Location	No.	UFI	Observer
Sharqiya	19	47.56	Myers
Girga	82	47.81	Myers
Menufiya	81	47.85	Myers
Giza	49	48.05	Myers
Qena and Girga	135	48.09	Myers
Egyptians	Various	62	48.12	Myers
Moslems (soldiers)	391	48.39	Myers

UPPER FACIAL INDEX

Group	Location	No.	UFI	Observer
Qena	.....	53	48.52	Myers
Copts (soldiers)	.....	42	48.57	Myers
Faiyum	.....	34	48.61	Myers
Dakahlia	.....	106	48.72	Myers
Zaqaziq	Sharqiya	288	48.76	Ammar
Beheira	.....	48	49.0	Myers
Hihya	Sharqiya	109	49.3	Ammar
Fellahin	Sharqiya	935	49.46	Ammar
Sharqiya	District	51	49.46	Ammar
Kafr Saqr	Sharqiya	94	49.63	Ammar
Belbeis	Sharqiya	144	49.64	Ammar
Faqus	Sharqiya	141	49.83	Ammar
Minieh el-Qamh	Sharqiya	128	50.13	Ammar
Jebeliyeh	Sinai	73	52.1	Field
Beduins	Sinai	150	53.3	Field
Tamiya	Faiyum	185	53.33	Field
Fidimin	Faiyum	305	55.4	Field

TOTAL FACIAL HEIGHT

Group	Location	No.	TFH	Observer
Siwa	Oasis	220	112.4	Mitwally
Farafra	Oasis	51	113.2	Mitwally
Dakhla	Oasis	397	113.2	Mitwally
Kharga	Oasis	150	113.5	Hrdlička
Baharia	Oasis	196	114.0	Mitwally
Kharga	Oasis	205	114.1	Mitwally
Zaqaziq	Sharqiya	288	115.36	Ammar
Belbeis	Sharqiya	144	115.38	Ammar
Kafr Saqr	Sharqiya	94	115.94	Ammar
Sharqiya	District	51	116.07	Ammar
Minieh el-Qamh	Sharqiya	128	116.32	Ammar
Hihya	Sharqiya	109	116.4	Ammar
Beduins (Towara)	Sinai	63	117.4	Murray
Faqus	Sharqiya	141	117.59	Ammar
Beduins	Western Desert	40	117.75	Murray
Beduins	Sinai	150	120.25	Field
Tamiya	Faiyum	186	121.15	Field
Jebeliyeh	Sinai	73	121.4	Field
Fidimin	Faiyum	305	122.55	Field

TOTAL FACIAL INDEX

Group	Location	No.	TFI	Observer
Dakhla	Oasis	397	84.0	Mitwally
Kharga	Oasis	204	84.1	Mitwally
Kharga	Oasis	150	86.3	Hrdlička
Zaqaziq	Sharqiya	288	87.29	Ammar
Hihya	Sharqiya	109	87.86	Ammar
Baharia	Oasis	196	88.1	Mitwally
Sharqiya	Sharqiya	51	88.14	Ammar
Farafra	Oasis	51	88.2	Mitwally
Kafr Saqr	Sharqiya	94	88.37	Ammar
Belbeis	Sharqiya	144	88.43	Ammar
Minieh el-Qamh	Sharqiya	128	88.61	Ammar
Faqus	Sharqiya	141	89.14	Ammar
Tamiya	Faiyum	186	89.45	Field
Siwa	Oasis	221	89.5	Mitwally
Beduins	Western Desert	40	90.0	Murray
Beduins	Sinai	150	91.05	Field
Fidimin	Faiyum	305	91.15	Field
Beduins (Towara)	Sinai	63	91.52	Murray
Jebeliyeh	Sinai	73	91.95	Field

NASAL HEIGHT

Group	Location	No.	NH	Observer
Fellahin	.....	138	45.0	Chantre
Towara	Sinai	18	45.0	Chantre
Maaza	Qena and Beni Suef	34	45.0	Chantre
Hawaitat	Matarieh	8	45.0	Chantre
Beduins	.....	188	46.0	Chantre
Total	Egypt	288	46.0	Chantre
Copts	.....	150	47.0	Chantre
Harabi	Faiyum	29	47.0	Chantre
Wulud Ali	Mariut	20	47.0	Chantre
Egyptians	Various	58	47.38	Myers
Beduins	Western Desert	40	47.69	Murray
Copts (soldiers)	.....	42	47.76	Myers
Moslems (soldiers)	.....	510	48.29	Myers
Kharga	Oasis	150	48.7	Hrdlička
Siwa	Oasis	210	49.0	Mitwally
Ayaideh	Menzaleh and Matarieh	25	49.0	Chantre

NASAL HEIGHT		No.	NH	Observer
Group	Location			
Beduins (Towara)	Sinai	63	50.18	Murray
Dakhla	Oasis	397	50.4	Mitwally
Minieh el-Qamh	Sharqiya	128	50.66	Ammar
Zaqaziq	Sharqiya	288	50.83	Ammar
Belbeis	Sharqiya	144	50.92	Ammar
Kafr Saqr	Sharqiya	94	51.05	Ammar
Hihya	Sharqiya	109	51.08	Ammar
Sharqiya	District	51	51.15	Ammar
Fellahin	Sharqiya	937	51.15	Ammar
Kharga	Oasis	205	51.5	Mitwally
Faqus	Sharqiya	141	52.36	Ammar
Farafra	Oasis	51	53.5	Mitwally
Jebeliyeh	Sinai	73	54.34	Field
Baharia	Oasis	196	54.8	Mitwally
Beduins	Sinai	150	54.86	Field
Tamiya	Faiyum	186	55.3	Field
Fidimin	Faiyum	305	57.49	Field

NASAL BREADTH

Group	Location	No.	NB	Observer
Faqus	Sharqiya	141	32.98	Ammar
Kafr Saqr	Sharqiya	94	33.14	Ammar
Hihya	Sharqiya	109	33.15	Ammar
Sharqiya	District	51	33.39	Ammar
Fellahin	Sharqiya	937	33.39	Ammar
Belbeis	Sharqiya	144	33.48	Ammar
Zaqaziq	Sharqiya	288	33.54	Ammar
Minieh el-Qamh	Sharqiya	128	33.66	Ammar
Wulud Ali	Mariut	20	34.0	Chantre
Towara	Sinai	18	34.0	Chantre
Fellahin	.....	138	35.0	Chantre
Jebeliyeh	Sinai	73	35.87	Field
Copts	.....	43	35.93	Chantre
Harabi	Faiyum	29	36.0	Chantre
Ayaideh	Menzaleh and Matarieh	25	36.0	Chantre
Copts	.....	150	36.0	Chantre
Total	Egypt	288	36.0	Chantre
Beduins	.....	188	36.0	Chantre
Moslems (soldiers)	.....	514	36.6	Myers
Baharia	Oasis	196	36.6	Mitwally
Beduins	Sinai	150	36.65	Field

Group	NASAL BREADTH		NB	Observer
	Location	No.		
Maaza	Qena and Beni Suef	34	37.0	Chantre
Tamiya	Faiyum	186	37.28	Field
Kharga	Oasis	150	37.3	Hrdlička
Fidimin	Faiyum	305	37.58	Field
Farafra	Oasis	51	37.6	Mitwally
Haweitat	Matarieh	8	38.0	Chantre
Egyptians	Various	59	38.24	Myers
Kharga	Oasis	205	39.0	Mitwally
Beduins (Towara)	Sinai	63	39.11	Murray
Siwa	Oasis	220	39.9	Mitwally
Dakhla	Oasis	397	40.0	Mitwally

NASAL INDEX

Group	Location	No.	NI	Observer
Faqus	Sharqiya	141	63.3	Ammar
Kafr Saqr	Sharqiya	94	65.16	Ammar
Hihya	Sharqiya	109	65.3	Ammar
Fidimin	Faiyum	304	65.58	Field
Fellahin	Sharqiya	936	65.71	Ammar
Sharqiya	District	51	65.71	Ammar
Sharqiya	.....	...	65.71	Myers
Belbeis	Sharqiya	144	66.32	Ammar
Zaqaziq	Sharqiya	288	66.35	Ammar
Jebeliyeh	Sinai	73	66.7	Field
Beduins	Sinai	150	66.86	Field
Minieh el-Qamh	Sharqiya	128	66.91	Ammar
Tamiya	Faiyum	186	67.3	Field
Farafra	Oasis	51	70.8	Mitwally
Baharia	Oasis	196	71.3	Mitwally
Wulud Ali	Mariut	20	72.34	Chantre
Dakahlia	.....	103	73.41	Myers
Ayaideh	Menzaleh and Matarieh	25	73.46	Chantre
Beheira	.....	45	74.39	Myers
Giza	.....	47	75.33	Myers
Towara	Sinai	18	75.55	Chantre
Copts (soldiers)	.....	42	75.77	Myers
Moslems (soldiers)	.....	349	75.83	Myers
Kharga	Oasis	205	76.5	Mitwally
Kharga	Oasis	150	76.59	Hrdlička
Harabi	Faiyum	29	76.59	Chantre

Group	NASAL INDEX		NI	Observer
	Location	No.		
Sharqiya	.....	19	76.7	Myers
Menufiya	.....	80	76.84	Myers
Copts	.....	150	77.59	Chantre
Faiyum	.....	34	77.61	Myers
Fellahin	.....	138	77.77	Chantre
Girga	.....	82	77.77	Myers
Beduins (Towara)	Sinai	63	78.2	Murray
Qena and Girga	.....	134	78.22	Myers
Beduins	.....	188	78.26	Chantre
Total	Egypt	288	78.26	Chantre
Beduins	Western Desert	40	78.9	Murray
Qena	.....	53	78.9	Myers
Egyptians	Various	56	79.41	Chantre
Maaza	Qena and Beni Suef	34	80.22	Chantre
Dakhla	Oasis	381	80.3	Mitwally
Siwa	Oasis	209	82.0	Mitwally
Hawaitat	Matarieh	8	84.44	Chantre

NON-NEGROID PEOPLES OF NORTH AFRICA¹⁴

Group	Location	No.	NI	Observer.
Arabs	Tunis	23	65.2	Collignon
Kabyles	.....	184	66.5	Prengrueber
Berbers	Tunis	120	69.8	Collignon
Algerians	Many	33	69.9	Collignon
Tunisians	Many	1334	70.2	Collignon
Berbers	Ellez, Tunis	40	72.0	Collignon
Berbers	Tunis	50	72.5	Collignon
Moroccans	.....	6	74.3	Collignon
Berbers	Touggourt	...	75.0	Rouaras, Weiss- gerber
Berbers	Djerid, Tunis	113	76.6	Collignon

EARS

According to Hrdlička (1912, p. 91) the dimensions of the ears possess certain anthropological value.¹⁵ For this reason and with his encouragement, I recorded the height and breadth of the left ear so that our series would be comparable.

EAR HEIGHT

Group	Location	No.	EH	Observer
Jebeliyeh	Sinai	72	56.35	Field
Beduins	Sinai	142	58.85	Field
Tamiya	Faiyum	185	60.27	Field
Kharga	Oasis	105	63.0	Hrdlička
Fidimin	Faiyum	38	64.65	Field

EAR BREADTH

Group	Location	No.	EB	Observer
Jebeliyeh	Sinai	72	33.59	Field
Beduins	Sinai	142	35.33	Field
Tamiya	Faiyum	185	36.35	Field
Kharga	Oasis	105	37.0	Hrdlička
Fidimin	Faiyum	38	37.41	Field

EAR INDEX

Group	Location	No.	EI	Observer
Fidimin	Faiyum	38	57.9	Field
Kharga	Oasis	105	58.9	Hrdlička
Jebeliyeh	Sinai	72	59.8	Field
Tamiya	Faiyum	185	60.31	Field
Beduins	Sinai	142	60.5	Field

MEASUREMENTS AND INDICES OF EGYPTIAN WOMEN

The few figures available are given here with the hope that new data will be obtained in the near future.

STATURE

Group	Location	No.	Stature	Observer
Maaza	Beni Suef	6	161.0	Chantre
Ayaideh	Menzaleh and Matarieh	6	166.0	Chantre
Khawazi	Karnak	11	166.0	Chantre
Nagama	Pyramids	21	172.0	Chantre

HEAD LENGTH

Group	Location	No.	GOL	Observer
Khawazi	Karnak	11	186.0	Chantre
Ayaideh	Menzaleh and Matarieh	6	190.0	Chantre
Nagama	Pyramids	21	190.0	Chantre
Maaza	Beni Suef	6	193.0	Chantre

HEAD BREADTH

Group	Location	No.	GB	Observer
Khawazi	Karnak	11	138.0	Chantre
Ayaideh	Menzaleh and Matarieh	6	140.0	Chantre
Nagama	Pyramids	21	143.0	Chantre
Maaza	Beni Suef	6	144.0	Chantre

CEPHALIC INDEX

Group	Location	No.	CI	Observer
Ayaideh	Menzaleh and Matarieh	6	73.68	Chantre
Khawazi	Karnak	11	74.19	Chantre
Maaza	Beni Suef	6	74.61	Chantre
Nagama	Pyramids	21	75.26	Chantre

BIZYGOMATIC BREADTH

Group	Location	No.	Biz. B	Observer
Khawazi	Karnak	11	129.0	Chantre
Ayaideh	Menzaleh and Matarieh	6	132.0	Chantre
Maaza	Beni Suef	6	133.0	Chantre
Nagama	Pyramids	21	134.0	Chantre

NASAL HEIGHT

Group	Location	No.	NH	Observer
Khawazi	Karnak	11	44.0	Chantre
Maaza	Beni Suef	6	45.0	Chantre
Nagama	Pyramids	21	47.0	Chantre
Ayaideh	Menzaleh and Matarieh	6	47.4	Chantre

NASAL BREADTH

Group	Location	No.	NB	Observer
Ayaideh	Menzaleh and Matarieh	6	33.0	Chantre
Maaza	Beni Suef	6	36.0	Chantre
Khawazi	Karnak	11	36.0	Chantre
Nagama	Pyramids	21	39.0	Chantre

NASAL INDEX

Group	Location	No.	NI	Observer
Ayaideh	Menzaleh and Matarieh	6	71.73	Chantre
Maaza	Beni Suef	6	80.0	Chantre
Khawazi	Karnak	11	81.82	Chantre
Nagama	Pyramids	21	83.98	Chantre

BEDUINS OF THE WESTERN DESERT

by

G. W. MURRAY

The following anthropometric data, which were scheduled to appear in Sons of Ishmael (London, 1935), were obtained near El Alamein about 1931. The instruments were kindly lent by the Royal Anthropological Institute, London.

Nos. 1-27 were Jumeiat, who are among the oldest inhabitants of western Egypt. Nos. 28-40 were Awlad Ali, by far the most important of the western Beduin and occupying with its vassals the north coast of Egypt from Salum to Alexandria.

BEDUINS OF THE WESTERN DESERT

No.	Stature	Circ.	L	B	B'	J	Go-go
1	1777	580	206	148	111	131	103
2	1712	550	196	140	105	136	110
3	1709	578	206	148	110	138	103
4	1677	570	190	147	116	137	97
5	1663	535	190	137	106	118	89
6	1719	560	190	145	112	128	102
7	1630	540	189	139	103	120	104
8	1739	590	204	146	116	136	103
9	1556	545	184	143	108	122	93
10	1720	547	190	141	104	124	88
11	1728	560	196	144	107	128	100
12	1555	525	188	139	108	129	100
13	1643	556	184	138	106	130	84
14	1602	551	190	140	102	124	88
15	1683	554	185	138	108	130	100
16	1645	563	189	148	111	130	102
17	1761	560	194	142	106	130	100
18	1615	580	196	146	110	134	108
19	1800	560	196	152	101	139	100
20	1612	555	193	147	110	137	107
21	1820	570	199	150	111	140	110
22	1775	590	206	148	115	143	110
23	1647	552	189	146	113	135	100

BEDUINS OF THE WESTERN DESERT

No.	Stature	Circ.	L	B	B'	J	Go-go
24	1678	568	195	143	108	134	101
25	1689	560	194	139	111	124	98
26	1635	573	197	151	113	129	104
27	1620	533	186	129	105	116	100
28	1645	572	194	150	112	136	93
29	1723	570	187	152	110	134	93
30	1651	551	192	133	109	124	86
31	1720	550	190	146	112	135	103
32	1604	555	196	144	112	137	108
33	1775	570	207	145	110	130	110
34	1722	550	194	144	120	129	110
35	1855	583	205	146	110	144	110
36	1743	559	195	140	109	125	103
37	1672	549	193	141	115	131	106
38	1656	540	190	141	111	126	100
39	1663	547	189	143	110	127	103
40	1614	553	196	140	108	130	100

No.	GH	G'H	NH	NB	B/L	GH/J	NB/NH
1	140	66	54	36	71.84	106.87	66.67
2	105	56	40	35	72.43	77.21	87.50
3	124	59	46	39	71.84	89.86	84.78
4	124	65	52	38	77.37	90.51	73.08
5	111	58	49	35	72.11	94.07	71.43
6	117	58	51	37	76.32	91.34	72.55
7	113	51	36	36	73.55	94.17	100.00
8	122	58	48	37	71.57	89.71	77.08
9	114	61	54	40	77.72	93.44	74.07
10	118	64	51	33	74.21	95.16	64.71
11	116	59	45	38	73.47	90.63	84.45
12	113	58	42	40	73.94	87.69	95.24
13	126	52	43	39	74.90	96.93	90.70
14	115	63	52	40	73.68	92.74	76.92
15	125	65	48	36	74.60	96.15	75.00
16	111	55	46	38	78.31	85.38	82.61
17	122	60	50	35	73.20	93.85	70.00
18	117	67	50	39	74.49	87.31	78.00
19	125	64	55	40	77.55	89.93	72.73
20	109	63	50	35	76.16	79.57	70.00
21	126	64	52	40	75.38	89.83	76.92
22	127	60	49	33	71.84	88.81	67.35
23	115	53	46	33	77.25	85.18	71.74
24	122	61	52	39	73.34	91.04	75.00

No.	GH	BEDUINS OF THE WESTERN DESERT					NB/NH
		G'H	NH	NB	B/L	GH/J	
25	121	60	48	45	71.65	97.58	93.75
26	111	57	46	40	76.65	86.05	86.96
27	97	47	41	33	69.35	83.62	80.49
28	115	55	48	39	77.32	84.58	81.25
29	113	51	39	39	81.29	84.33	100.00
30	116	58	44	38	69.27	93.55	86.36
31	120	60	45	36	76.85	88.89	80.00
32	112	59	52	33	73.47	81.75	63.46
33	120	63	53	43	70.05	92.31	81.13
34	118	62	47	40	74.23	91.47	85.11
35	123	68	54	35	71.22	85.42	64.81
36	122	61	50	36	71.80	97.60	72.00
37	115	60	45	35	73.06	87.79	77.78
38	106	48	45	35	74.21	84.13	77.78
39	111	51	45	34	75.66	87.40	75.56
40	118	60	47	41	71.43	90.77	87.23

MEASUREMENTS AND INDICES OF BEDUINS OF WESTERN DESERT

Measurements ¹⁴	No.	Range	Mean	S. D.	C. V.
Stature.....	40	156-186	168.85 ± .70	6.60 ± .50	3.91 ± .29
Circumference.....	40	525-590	560.80 ± 1.69	15.80 ± 1.19	2.82 ± .22
Head length.....	40	184-207	193.90 ± .70	6.55 ± .49	3.38 ± .26
Head breadth.....	40	129-152	143.30 ± .49	4.60 ± .34	3.21 ± .24
Minimum frontal diameter....	40	101-120	109.55 ± .43	4.02 ± .30	3.67 ± .28
Biszygomatic breadth.....	40	116-144	130.75 ± .70	6.55 ± .49	5.01 ± .38
Bigonial breadth.....	40	84-110	101.00 ± .80	7.55 ± .57	7.48 ± .57
Total facial height.....	40	97-140	117.75 ± .80	7.50 ± .57	6.37 ± .48
Upper facial height.....	40	47-68	58.85 ± .57	5.31 ± .40	9.02 ± .68
Nasal height.....	40	36-55	47.69 ± .49	4.62 ± .35	9.69 ± .73
Nasal breadth.....	40	33-45	37.40 ± .30	2.78 ± .21	7.43 ± .56
Indices¹⁴					
Cephalic.....	40	69.27-81.29	73.76 ± .27	2.50 ± .19	3.39 ± .26
Facial.....	40	77.21-106.87	90.00 ± .57	5.40 ± .40	6.00 ± .45
Nasal.....	40	63.46-100.00	78.90 ± .92	8.65 ± .65	10.96 ± .83

APPENDIX B

CAMEL BRANDS

On the northeast side of the Faiyum, about 1,000 paces from Kom Oshim at the juncture between the desert and the sown, lives Hajji Abdullah el-Asfar.

Here stands Bait el-Asfar, a small village of mud huts with flat roofs, within easy walking distance of a fifteen-foot canal that is linked to the main canal system in the Tamiya area.

Hajji Abdullah is a handsome, white-bearded patriarch with deep-set, kindly dark-brown eyes.

When I called on Hajji Abdullah on November 27, 1947, he received me with typical Beduin cordiality. He led me past some mud-brick buildings to a black, camel-hair tent with three tent poles. Below were reed mats and decorative pillows. In the center was a small, rectangular fireplace in which spouted metal vessels rested on glowing embers. We seated ourselves around the hearth. After the usual polite conversation, I asked Hajji Abdullah about his tribe, which enjoys the highest prestige in this region. These former Beduins have become settled cultivators on the desert fringe of the rich agricultural belt, the Faiyum. Behind them, all the way to Cairo, lies sand. Ahead is the dark-green irrigated Faiyum. The constant force of the wind is shown clearly by the large eroded nodules that dot the plain between Bait el-Asfar and Kom Oshim.

Hajji Abdullah told me that he could not sleep in a house made with walls; as a result he lived in his Beduin black tent, as he and his ancestors had always done. In fact, with a smile on his face, he pointed to some buildings nearby where the cattle sheltered at night.

Regarding their origin, Hajji Abdullah said that he had come many years before from near Tripoli, some 1,100 airline miles to the northwest. About 1,000 of his tribesmen, forming an entire subsection, left their 20,000 relatives and migrated to the east across the Libyan Desert. They had settled finally on the edge of the Faiyum, where they could enjoy desert life but at the same time derive the benefits of permanent running water nearby. Gradually they had learned to become cultivators of the fertile soil and herdsmen of cattle.

Beduin by tradition, they are now settled cultivators.

With a camel stick I drew some Beduin camel brands (wasm; plural, wusûm or wasmat) in the sand. Immediately the group became interested. Hajji Abdullah then drew his own wasm, which was: | under left arm; || under right arm; = on right flank; and O on left cheek.

The assembled group then drew on the ground the following camel brands.¹⁷

TEXT FIG. 1 CAMEL BRANDS OF EGYPT AND NORTH AFRICA

Camel Brand	Tribe	Locality
101	Awlad Ali	Alexandria
X	Bumadi	Rabbiya
⌌	Samalus	Mariut
Σ	Awlad Suleiman	Garun
◻	Magharba	Benghazi
⌌	Senussi	Libya
T	Jawazi	Faiyum
J	Mashraghi	Faiyum
Z	Atamaira	Faiyum
Y	Awaqir	Faiyum
ooo	Guttan	Faiyum
└┐	Awvam	Faiyum
0+	Jawabis	Faiyum
✂	Maaza	Faiyum
└	Sheikh Marzug	Farafra

NOTES

- ¹ For history of Tamiya see Tarikh il-Gabarti (in Arabic).
- ² The methods and technique have been described in detail elsewhere (Field, 1939, pp. 278-288).
- ³ For a detailed study, see the forthcoming monograph by Henry Field and Winifred Sweaton Thomas, "Body-Marking in Southwestern Asia," which includes tattooing and the uses of henna and kohl.
- ⁴ Usually of the order Columbiformes throughout this section. In many cases the penmanship was so poor as to make identification uncertain.
- ⁵ No. 107 wore a chain on his right wrist for the same reason.
- ⁶ Throughout the following section all individuals listed in parentheses were tabulated by hand.
- ⁷ Excerpted from Ammar (1944), Chantre (1904), Craig (1911 and 1912), Hrdlička (1912), Mitwally (1944 and 1946), and Myers (1903, 1905, 1906, and 1908). (The men measured by Myers had been selected for the military on the basis of good stature and strength.)
- ⁸ See Field (1935, 1936, 1939a, and 1940).
- ⁹ See Field, "Contributions to the Anthropology of the Caucasus" (forthcoming).
- ¹⁰ The head length was recorded from nasion, hence the mean is less and the cephalic index greater than if glabella had been used.
- ¹¹ Quoted from Hrdlička, 1912, p. 48. The French spellings have been retained. For references to North Africa see Coon, 1939.
- ¹² Other spellings are "Elissieff" and "Jelissejew."
- ¹³ Also written "Wulud" and "Wilad."
- ¹⁴ From R. Collignon, "La nomenclature de l' indice nasal du vivant," Revue d'Anthropologie, Third Series, Vol. 2, pp. 8-20, 1887. Quoted from Hrdlička, 1904, p. 78. Collignon's spellings have been retained.
- ¹⁵ For additional comparative data see Field, 1939, p. 488.
- ¹⁶ These were calculated at Harvard.
- ¹⁷ See Field, "Camel Brands of Southwestern Asia" (forthcoming).

In the following list of bibliographical references, no attempt has been made to compile all titles on the Faiyum but rather a selected working list for anthropogeographers. The reader is presumed to have access to the reports and lists of titles published by Ammar, Caton-Thompson, Huzayyin, Sandford, and Arkell as well as to the bibliography with 6,158 titles compiled under the direction of Henri Lorin, 1928-1929.

Abbreviations

AA	American Anthropologist
AAAS	American Association for the Advancement of Science
AJA	American Journal of Archaeology
AJPA	American Journal of Physical Anthropology
BRSOI	Bollettino della Reale Società Geografica Italiana
FMNH	Field Museum of Natural History (now Chicago Natural History Museum)
JRAI	Journal of the Royal Anthropological Institute of Great Britain and Ireland
JRAS	Journal of the Royal Asiatic Society, London
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PART TWO

SINAI

Sinai links Asia and Africa. Thus, in the rectangle north of the mountain complex forming the southern triangle, flint tools and flakes, left by the ancient intercontinental hunters and migrants, should lie on the surface. Theoretically, closer typological resemblances to the cultures of the Nile Valley should be found on the western side of the Sinai Peninsula, and correspondingly closer resemblances to Palestine, Syria, Jordan, and Saudi Arabia on the east. Here should be found the cultural links between Afrasia, Asiafrica, and Eurafasia.

Stone implements have been found in the Nile Valley as far west as Kharga Oasis and to the east in Palestine and Jordan. Furthermore, surface finds had been reported in three areas of Sinai: at El Qusaima and along the eastern border near the Palestine frontier (found, but as yet unpublished, by the Abbé Henri Breuil; they are now in the Trocadéro Museum in Paris, where I examined them through the courtesy of Mr. Harper Kelley); in the lower part of the Wadi el-Arish (found by H. W. Seton-Kerr).

Since Professor William F. Albright had joined the expedition as archaeological adviser, our combined archaeological interests ranged from Lower Paleolithic to historical times. In addition, I planned to obtain anthropometric data and photographs of at least 200 male Beduins for comparison with William M. Shanklin's series from Jordan and my own groups in Iraq, especially the Northern Shammar from west of Mosul (See Field, 1951b).

On December 15, thanks to the generous coöperation of the late Prime Minister Nukrashi Pasha and Minister of Education Sanhourî Pasha, we were able to leave for a five-week reconnaissance survey in Sinai. The party consisted of William B. Terry, field executive and organizer; Professor William F. Albright, of Johns Hopkins University; S. A. Huzayyin, Professor of Geography at Farouk I University in Alexandria; and Ahmed Lutfi, representative of the Department of Antiquities in Cairo. At the last moment Huzayyin was granted permission to accompany us in the northern area for eight days. He assisted with the general arrangements and in the collect-

ing of Stone Age specimens, which will be published by him.

At El Arish, General Miralai Mohammed Zaki Abdul Hamid Bey, Governor of Sinai, assured us of every assistance and at the same time called attention to certain geographical restrictions in the military zone in which we were to operate. Our results have appeared in part in Albright, 1948a and b; Field, 1948a and b (especially map on p. 799); and Phillips, 1948.

On December 24 we were installed as guests of the Egyptian government in the rest house at Abu Zeneimeh on the shore of the Red Sea. Shortly thereafter we were joined by Wendell Phillips, Mrs. Terry, business manager of the expedition, and Walter A. Thompson, technical assistant. We were also supported by Captain (now Major) Grammar G. Edwards, USMC, chief of transportation, who assisted in planning the Sinai phase of the expedition but remained at Kom Oshim in the Faiyum. Ahmed Lutfi, representative of the Department of Antiquities, proved an excellent companion and interpreter throughout the journey.

Throughout our work in Sinai we were assisted by three sharp-eyed and trained excavators, Hamadi, Mahmud el-Far, and Maghrabi -- all Guftis from Quft (ancient Coptos) on the Nile.

Selman Ahmed, a one-eyed, one-armed Beduin former policeman, was our guide in the south. He also persuaded the Beduins and Jebeliyeh to submit to the calipers and cameras.

Our visit to St. Catherine's Monastery and the gracious hospitality of the monks will always be remembered by each of us.

Just before the trip to Serabit el-Khadem we were joined by Dr. John C. Trever, Dr. Willard A. Beling, and Dr. William H. Brownlee from the American School of Oriental Research in Jerusalem.

We collected some botanical, ethnological, and zoölogical specimens. An excellent photographic record was obtained by Mr. and Mrs. William B. Terry.

To summarize, during the reconnaissance survey from December 15, 1947, to January 17, 1948, we located a chain of surface stations that yielded typologically Paleolithic, Neolithic, Mesolithic, and early Historical flint implements in northern, central, and southwestern Sinai. Thus, we proved that man in Paleolithic and

later phases of culture lived in Sinai.

At Merkhah the port of the Ancient Egyptians was located. Thus, new light was thrown on the route of the Exodus, through the "Sea of Reeds" in the north (see Field, 1948b).

A new deciphering of the Proto-Sinaitic inscriptions resulted from Albright's visit to mines "L" and "M" at Serabit el-Khadem (see Albright, 1948b).

Anthropometric data were obtained on 223 Beduins and Jebeliyeh; my recorders, to whom I am deeply indebted, included Albright, Huzayyin, Lutfi, Phillips, Gladys Terry, and Thompson. The best account of the Beduins of Sinai is given by Murray (1935). Since there is considerable literature on Sinai in this study, it did not seem desirable to compile all data available on this area but rather to prepare a bibliography and to guide the student by footnote references to the main sources. In addition, Petrie and Murray should always be consulted. No attempt was made to collect all references to early travels or to St. Catherine's Monastery. However, a representative selection has been included. Gratitude must be expressed to the librarians of the Royal Geographical Society in London, the National Museum in Jerusalem, and the Royal Geographical Society in Cairo. For convenience the spellings follow Albright or Murray.

The raw data and photographs have been placed on Microfilm No. 2939, pp. 1-94, in the American Documentation Institute (ADI), 1719 N Street, N.W., Washington 6, D.C., where a copy may be purchased. In addition, our Traverse Report, meteorological tables, and excerpts from the agricultural census of Egypt (1939) have been placed on Microfilm No. 3226, pp. 54-172, in ADI.

Attention is called to "La Péninsule du Sinaï" by Jacques Daumas, pp. 1-459, Cairo, 1951. The maps used were the two sheets on 1:500,000 scale published by the Survey of Egypt: (a) North Sinai, 1945 (45/57); and (b) South Sinai, 1943 (T/43/327).

In conclusion, our thanks must be reiterated to the Egyptian Government for facilitating these researches in Sinai, especially at a time when political unrest placed unusual restrictions on scientific exploration.

Sinai¹ forms the land bridge between Asia and Africa. Geographically Sinai belongs to Asia, but politically to Egypt, therefore Africa.

Location. -- The triangular peninsula of Sinai lies between Egypt and Palestine. The Mediterranean forms the northern boundary. The Suez Canal and Gulf of Suez lie on the western side, the Gulf of Aqaba to the south-east. These two arms of the Red Sea touch the side of the inverted triangle. At Aqaba there is a juncture of Palestine, Jordan, and Saudi Arabia. The eastern boundary links with Palestine, the southern part being the Negeb.

The land along the Mediterranean coast is mainly sand dunes; down the Suez Canal lies more arid, sandy soil. However, about twenty miles back from the canal, a rocky ridge rises out of the sand, which in turn opens onto a vast gravel plateau known as the Badiet Tih or "Plain of Wandering." This extends for about a hundred miles toward the Palestine border and northward to within twenty miles of the Mediterranean. The plateau extends approximately midway to the apex of the triangle, and south of it are range after range of multicolored granite mountains with red predominant, from which the Red Sea derives its name. The southeastern coast is extremely picturesque with an irregular contour. High mountains run down to the sea, which is deep blue.

Geology.² -- The northern plateau or Wilderness of Tih,³ running from the great escarpment to the Mediterranean, consists of a bare, sandy waste with xerophytic flora. In this expanse of drifted sand are low hills and occasional chains of hills. The Wadi el-Arish⁴ with its tributaries, the Wadi Geraia, Wadi el-Bruq, Wadi Aqaba, and Wadi Ruag, dominates the eastern side of the northern section. Along the Wadi el-Arish, from Abu Aweilqileh to El Arish, the drifted sand has covered almost all historical traces.

South of this great belt of sand, red sandstones appears in shelving masses leading southward toward the escarpment and beyond to the great mountain complex where the Ancient Egyptians mined turquoise at Serabit el-Khadem (2,650 feet) and at Jebel el-Magharah (at

1,170 feet). According to Eckenstein (p. 3), copper ore was also mined in the Wadi Nasb and in the Wadi Khaliq (here with iron and manganese). In the Wadi Sened, a dike rich in copper traverses syenite for nearly two miles. The area of concentration was the valley system of the Wadi Babaah-Wadi Shellal and the Wadi Sidreh to the south. Their outlet was on Merkhah Plain, where we located the ancient port.⁵

To the south of the ancient mining district the sandstone connects with the plutonic rock that forms the magnificent mountains of the south-central part of Sinai. Here rises Mount Sinai (Jebel Musa, 7,359 feet), Jebel Serbal (6,734 feet) described as "one great lump of diorite," and Jebel Katarina, the loftiest of whose triple peaks reaches 8,527 feet. Among these mountains lies the fertile Feiran Oasis.

The southeastern part of Sinai has been rarely visited, because of its inaccessibility and lack of attraction compared to St. Catherine's, an object of pilgrimage for many hundreds of years.

Communications.⁶ -- Egypt and Palestine are joined by a railroad line that follows the northern coastline, passing through El Arish, the capital of Sinai. The main paved road runs from Ismailia between Jebel el-Magharah and Jebel Yeleq, just south of Jebel Ilbineh (Albineh or Libni), to Abu Aweiqileh. Here the road forks, one branch leading north via El Arish then east to cross the Palestine border south of Rafa, the other via Er Rawafi (El Ruafa) to El Auja on the northern fringe of the Negeb.

The old pilgrim road (haj), which is still used, runs from Suez to Nekhl, El Themed, Aqaba, and on to Medina and Mecca. There is also a road from Abu Aweiqileh to El Qusaima and on to El Kuntilla and Aqaba. Another track connects Nekhl to El Qusaima. The sandy track we followed ran due south from just west of Jebel Ilbineh on the main transdesert road to Bir Hasaneh and on to Nekhl. There is no road or track for wheeled vehicles southward from Nekhl into the mountain complex. The coastal road from El Qantara to El Arish is reported to be passable by jeep if interisland transportation may be found.

Along the southwest coast a road, partly corrugated, runs from Suez to Abu Zeneimeh to El Tor and continues toward Ras Mohammed until it turns east to Sherm and northeastward to Nabq. There is no track for wheeled

vehicles from Nabq to Aqaba.

Tracks, some passable by jeep or even truck, follow the wadi courses. The best track into the mountains leads from Abu Zeneimeh to Feiran Oasis and up the Wadi es-Sheikh to St. Catherine's Monastery at the foot of Mount Sinai. The track from Abu Zeneimeh to the mangane-
nese mines at Umm Bogma is kept in good repair by the Sinai Mining Company.

These tracks are mostly rough, and an average speed of fifteen miles per hour is difficult to maintain except in certain sections.

Climate.⁷ -- In general, the climate is very healthful and free from febrile influences, a few low places like Tor excepted. The country is exposed to sudden changes in temperature, which occur daily along the coast, owing to abrupt transition of wind direction from north to south.

In the mountainous districts the nights are almost always cold, but in the sandy valleys like those near Tor the summers are intensely hot because of unclouded skies, the glare of the surrounding rocks, and the radiation from the sand. There is considerable rain from the middle of October until the middle of April, resulting in violent floods in the mountainous areas. In ordinary years there is sufficient rainfall to sustain a large amount of scrub and tamarisk bush, and with an abnormally wet winter the entire peninsula except for sand-dune country is covered with green for two spring months.

The following data on rainfall were recorded during 1939: at El Qusaima (Kosseima), located 30°40' N and 34°22' E, 7.0 mm. fell on one day in November; this was the only day during which 1.0 mm. or more was recorded. Similarly, at El Themed (29°40' N and 34°22' E; altitude 616.0 m.) during February 6.0 mm. fell on one day. No rain was recorded at Bir Hasaneh (Hassana), located 30°28' N and 33°48' E. At Ismailia (30°36' N and 32°16' E; altitude 13.0 m.) a few rain drops were recorded during January, April, and June. The only rain occurred during February (5.7 mm.) and March (20.6 mm.). Meteorological observations recorded at El Arish, Nekhl, and Tor have been included on Microfilm No. 3226 in the American Documentation Institute.

Water Supply. -- The plateau area is generally waterless except for permanent springs such as those at Magdhaba, Bir Hasaneh, the southern border of Jebel el-

Halal, and Nekhl.⁸ The plateau is drained in the direction of the Mediterranean by thousands of shallow watercourses but primarily by the great Wadi el-Arish, which meanders across the center and northeastern part of Sinai. This wadi and its numerous tributaries and feeders remain dry during the greater part of the year but occasionally are in full flow. Wadi Gharandel is the most important and largest valley in the limestone district. Draining the greater part of the foot of the Tih Plateau, it carries more water than any valley in Sinai except those fed by the snows of the granite highlands. The mountains of the south are traversed by many wadis and contain a number of natural springs (such as Bir Selmi) and fertile oases (such as Feiran). There is an abundance of springs both at Tor and in the neighboring mountains. Water holes or small wells exist about every twenty or thirty miles in all parts of Sinai. The water supply for the Sinai Mining Company at Abu Zeneimeh is brought by steamer from Suez. The water at St. Catherine's Monastery comes from a deep well inside the buildings. Other smaller wells exist in the immediate vicinity of the Monastery.

Vegetation.⁹ -- Naturally in such a dry area all vegetation, except in the few oases, is limited to xerophytic forms. Stunted trees and scrub bushes struggle for survival in the wadi beds. Tamarisk, a species of broom (rutm), and a prickly shrub with fleshy leaves (ghraghada) occur widely. Camel thorn (hatab) grows sparingly in the Wilderness of Tih. Date palms (Phoenix dactylifera) were seen at El Arish, Nekhl, Suez, just north of Abu Zeneimeh, and at Feiran.

Agriculture. -- By far the most productive section in the northern part of the country is the undulating plain of sandy soil along the Mediterranean coast from El Arish to Rafa, where excellent crops of barley and wheat are grown during the winter months and watermelons flourish in summer.

Excellent dates are grown both at Tor and in Wadi Feiran. Although dates are the main fruit crop of the peninsula, a few oranges and apricots are grown near Tor, and in Wadi Feiran a considerable number of sich trees produce an edible fruit about the size of a cherry. Several acres of land in Wadi Feiran are given over to the cultivation of corn and tobacco.

Until 1948 the only real dam and reservoir were in

the Wadi el-Qideirat on the northeastern frontier almost due east of El Qusaima.

During the past few years at Er Rawafi (El Ruafa), two miles southeast of Abu Aweigileh, Ali Bey Shafei and his assistants have constructed a large stone dam across the Wadi el-Arish. It is planned to irrigate an area by means of this water control. If this succeeds, similar projects will follow.

The Arabs sometimes construct small dams in an effort to lead the flood waters to their crops. Stones and scrub bushes are placed in lines across the wadi beds, impeding the swift flow of the water and preventing the rich accumulated silt from being carried away to the sea. This deposit of yellow silt covers the natural gravel surface of the desert after a flood and produces excellent crops of barley, wheat, and corn in years when ideal flood conditions occur. The normal times for floods are at the end of October, in December, in February, and at the end of March. Although at times there are as many as six floods a year, there are sometimes none and seldom more than three; so it is only about once in seven years that the ideal conditions exist.

There is some moisture in the soil below the surface, which is procurable by digging down to the harder subsoil. In many places the Beduins have done this, in some cases raising the water mechanically by means of a water wheel (naur or noria) or by lift (shaduf).

Along the shores the great deficiency in vegetation is compensated by an abundance of marine life, especially near Tor, Nebq, Dahab, and Nuweiba el-Tarabin. Fishing in the Gulf of Suez and in the Gulf of Aqaba is very profitable, but there is constant danger from barracuda, sharks, and rays. The sand mackerel run up to forty-five pounds, and the milk fish and many other kinds provide excellent food and sport (See Jarvis, 1933a).

Fauna. -- Domestic animals naturally form the basis of transportation for the nomads of Sinai.

Animals,¹⁰ including birds, are rare. However, the gazelle (Gazella gazella Dorcas), ibex (Capra aegagrus, Ar. beden), leopard (Panthera pardus), sand fox, hyrax (Biblical coney), striped hyena, lynx or caracal, wildcat, jackal, hedgehog, porcupine, and mole have been reported in recent years, mainly by Jarvis. The wolf (deeb) is also reported, but this seems doubtful.

Among amphibians and reptiles are lizards, including

the desert monitor, and the horned viper (*Cerastes*, sp. or *Pseudocerastes fieldi*)¹¹ called locally "Abu Genabia" ("the Father of going sideways") because it moves thus by raising its coils laterally. I saw one snake, which we collected, northwest of Bir Hasaneh. Lizards, seen in many regions, were exceptionally difficult to catch.

Jarvis (1933a, pp. 201-224) describes the birds and includes partridges (Chikor, Ar. seesee) and the Crowned, Senegal, and Imperial sand grouse, the lesser and Arabian bustard, and the quail. Nearly all avifauna in Sinai are birds of prey, either falcon hawk or eagle. Among indigenous birds are crested, sand, and bifasciated larks, mourning chats, brown-backed raven, golden eagle, and a host of other birds of prey of the falcon, buzzard, harrier, vulture, and hawk tribes.

HISTORICAL OUTLINE

Paleolithic¹² -- Sinai has been occupied for at least 100,000 years. Paleolithic man in the Acheulo-Levalloisian cultural phase migrated across the intercontinental land bridge between Africa and Asia. At present it is difficult to determine with certainty the direction of the flow, but in all probability it was in both directions.

Although such great streams as the Wadi el-Arish, Wadi Gharandel, Wadi Feiran, and Wadi es-Sheikh flowed with water, the animals to be hunted must have been limited, which would naturally reduce the number of hunters.

Neolithic¹³ and Later. -- A Neolithic settlement was found by Albright on December 19, 1947, just south of Kilometer 156 on Ismailia-Abu Aweigileh road.

Stone circles, rectangular ruins, and circular tombs (nawamis)¹⁴ occur in the Wadi Solaf and many other areas in Sinai. To draw up a composite picture, it will be necessary to plot on a large-scale map the range and distribution of all these stone ruins -- a large task.¹⁵

Egyptians. -- In the Wadi Magharah between Abu Zeneimeh and Feiran Oasis are turquoise mines worked by the Ancient Egyptians.¹⁶ The inscriptions have been attributed to the First Dynasty.

Recent History.¹⁷ -- The history of Sinai is peopled by Moses and the Israelites, Nabateans, Moslems, Crusaders, Turks, Allied troops in World War I, and finally the Egyptians.

POPULATION

Ancient. -- Until a detailed archaeological survey of the entire peninsula has been completed, it will be impossible to determine the range and distribution of ancient man in Sinai.

As a result of our reconnaissance survey and the previous work¹⁸ of Petrie and Currelly, Lawrence and Woolley, Seton-Kerr and Breuil, it is now possible to affirm that man in Paleolithic stages of culture lived in northern, northeastern, and southwestern Sinai.

Neolithic and Mesolithic implements were collected from surface sites in the northern area, and trial trenches were sunk in a Chalcolithic rock shelter in the Wadi Khreizeh off the Wadi Feiran in southwestern Sinai.

Ancient Egyptian and later stone picks and tools used by the miners of turquoise were found in small wadis below the temple area at Serabit el-Khadem.

The ancient and more recent occupation of Sinai to the twentieth century has been well documented.¹⁹

Modern. -- Since the references are scattered widely, the following procedure will be employed. The recent study by Murray (1935) will be presumed to be available to the reader, for herein the tribes and their history and origin are discussed in detail. Thus, for comparative purposes a few selected references to the main tribal groups with particular emphasis on their history and origin will be given in chapter III. No attempt has been made to compile all references in all languages, but rather variations in the spellings of each tribe and subtribe are given.

The Beduins of Sinai are divided into two main groups: Tiaha or Beduins of the Plain (Tih) and the tribes of area north of the great east-west escarpment south of Nekhl; and Towara, who live in the broad-based, inverted triangle south of the above escarpment.

Northern Group (Tiaha). -- According to Ritter (vol. 1, pp. 404-412), there are four groups:

1. Tiaha or Tiyaha (Ritter), Tiyayah (Robinson), Beteiha or Ti (Robinson), Tyaha (Burckhardt), or Tyar (Niebuhr). This name has been given to them by strangers.

2. Tarabin or Terabein and Terabin (Ritter). They were scattered widely in Egypt, but were driven eastward by the Mamelukes. Between the Terabin and the Towara there is a binding oath for mutual assistance in the

words: "as long as there is water in the sea, and till hair shall grow in the palm of the hand." They are said to be the most numerous of all the Beduin tribes of Sinai.

3. Heiwat, with about a hundred able-bodied men, live near Themed.

4. Azazimeh are mentioned by Seetzen, who encountered a shepherd near Abdeh (Eboda).

Southern Group (Towara). -- Ritter (vol. 1, p. 316) wrote that the southern group of nomads were called Turoniani, Madianites (Midianites), and Beduins by Brocardus (Burchard) during the thirteenth century. Maundeville,²⁰ writing in the following century, calls them Bedoynes and Ascopardes.

In another passage Ritter (vol. 1, p. 395) states that Coutelle described the Towara as "sunburnt, very brown, almost black: their dark eye lively, and slightly fringed: their expression serious, but not sad: their height from 4' 10" - 5' 4", and therefore only medium."

Ritter (vol. 1, p. 387) divides the Towara²¹ into five main groups: Suwalhe, Aleiqat, Mzeine, Wulud Sulaiman, and Beni Wassel.²²

1. Suwalhe or Szowaleha (Ritter), Sawalihah (Robinson), Soelhe (Ruppel), and Saualhe (Lepsius). This is the largest tribe and boasts of having been the first settlers in Sinai (from the seventh to the thirteenth centuries). They can be traced historically back to Jedham, who were in Mohammed's time the inhabitants of Madian, east of the Gulf of Aqaba. Burckhardt divides the Sawalha into four groups:

(a) Wulud Sayyid or Ulad Said (Ritter), Aulad Said (Robinson), and Wellad Said (Lepsius). They possessed the best lands. Their subdivisions were: Seheri, Saidi, and Retesi.

(b) Quraish or Korashy (Ritter). Originally from the Hejaz, they have mixed with the Towara.

(c) Awarme or Owareme (Ritter). A very small tribe of about forty men, who boast that they were the first to settle in the peninsula.

(d) Rahamy, with possibly only ten families.

2. Aleiqat or Aleygat (Burckhardt), Aliekat (Robinson), Leghat (Niebuhr, Coutelle and Seetzen), Alekati (Ruppel), and Alekat (Lepsius). This is the second leading tribe, although much smaller than the Sawalha. They are allied closely with the Muzeina. Burckhardt discovered a nomadic branch of this tribe near the Nile

in Nubia, a day's journey north of Deir. The Aleiqat of Sinai knew of the existence of this branch.

3. Mzeine or Mezeine (Ritter), Muzeiny (Robinson), Misene (Ruppell), and Mizene (Lepsius). They are newcomers and are consequently looked down upon with great scorn. No other tribe is permitted to intermarry with them. Four families of the powerful Muzeina tribe in the Hejaz, fleeing from the consequences of a deed of blood, took refuge in Sinai. They were received not as equals but as vassals, and a tribute of sheep was exacted from them yearly.

4. Wulud Sulaiman or Ulad Soleiman (Ritter), Beni Selman (Burckhardt), Aulad Suleiman (Robinson), and Weled Suleiman (Lepsius). They were reduced to a few families, living at Tor and in the Wadi es-Sheikh. In 1846 Lepsius presumed them to be extinct,²³ but Burckhardt discovered a few²⁴ near Tor.

5. Beni Wassel or Wasel consist of a few families near Sherm. They are also found in Upper Egypt and seem to have originated from Barbary.

With regard to the Jebeliyeh, Ritter²⁵ (vol. 1, pp. 241, 384-386) describes how Wolff in 1821 was shown a "History of the Foundation," in which it was stated that the founder, the Emperor Justinian, sent a thousand Christians from Servia (whom the Arabs called Subbian) and masons from Mattarea near Heliopolis and that these men built the Convent during the year 527, the first year of Justinian's reign. Wolff adds that these Subbian became Moslems, as they remained until 1821, when they were baptized by Father Kaliston. Schimper described the menial duties of the Jebeliyeh ("Subbian ed-Deir").

The Jebeliyeh themselves acknowledge their Christian descent, and are consequently spoken of scornfully by the Arabs as "the sons of the Nazarenes." They must practice endogamy, although their entire manner of life is similar to that of the Beduins. Burckhardt (pp. 562 et seq.) estimated that they could put 120 armed men into the field. Coutelle (vol. 2, p. 303) wrote in 1800 that their number was 135 and that they were subdivided into five tribes. Ruppell (p. 194) states that in 1829 there were only eighty-two names enrolled at the Convent as entitled to receive any bounty at the hands of the monks. Schimper distinguishes the Jebeliyeh by their features and complexion, and ascribes the cause of this

to their intermixture with Berbers or Magrebi, who as pilgrims or as Egyptian troops often cross the peninsula. On the other hand, Burckhardt refers to the remarkable beauty of these Arabs and says that their daughters are the fairest of the land. Ritter (vol. 1, p. 385) continues that despite their dishonored position as pseudo-Beduins,²⁶ the Jebeliyeh are strong and hardy. They are the servants who draw water, bring wood, till the garden, and do all manner of outdoor work. For their labors they receive half the harvest.

Palmer, writing in 1871, divided the Towara²⁷ into:

1. Suwalhe,²⁸ divided into three clans or families.
2. Wulud Sayyid or Auled Said.
3. Grashe or Garrasheh near Wadi Feiran.
4. Aleyat or Alik in Wadi Nasb.
5. Mzeine or Emzeineh (Muzaine), who are regarded

by the Towara as comparative strangers, although they are not excluded from the right of intermarriage. They are believed to have come recently from the Hejaz. Burton²⁹ wrote: "Anyone who knows the Bedawyn can see that the Muzaine are pure blood. Their brows are broad, their faces narrow, their features regular and their eyes of moderate size, whereas the other Towarah clans are as palpably Egyptian. They are of an impure race, Egypto-Arabs, whereas their neighbour, the Hedjazi, is the pure Syrian or Mesopotamian."

6. Auled Shahin near Tor, a branch of the Aleyat.
7. Jebeliyeh,³⁰ the so-called serfs of the Convent,

who are held to be the lineal descendants of the four hundred Wallachian and Egyptian slaves whom the Emperor Justinian settled in the peninsula.

Currelly (in Petrie, 1906, pp. 268-269) estimated the Beduin population of Sinai as from 6,000 to 10,000 men. He quotes a Sudanese soldier as giving the following figures for adult males:

Tribe	No.	Area
Alegat and Hamedat.....	2,000	Wadi Magharah
Awarme and Suwalha....	200	Jebel Ramleh -- Serabit el-Khadem
Wulud Sayyid.....	300	Feiran Oasis
Mzeine.....	1,000	Ras Mohammed
Grashe.....	?	Jebel Musa -- Feiran Oasis

According to the most recent³¹ data available,³² the population of Sinai in 1937 was estimated at 10,355 males and 7,656 females.

Before leaving England I wrote Major C. S. Jarvis, former governor of Sinai and author of several delightful and informative books on this peninsula (see Bibliography). In a letter dated October 20, 1947, Major Jarvis replied:

The Beduin of Sinai are, I should say, very pure-bred on the whole, except for an occasional black man who is a descendant of their African slaves. I should say that the purest-bred tribes are the Lahewat [Laheiwat] who are around in the area by Kuntilla as far as Themed, the Mzeina [Muzeina] who came originally from around Mecca and who live by Tor and the extreme south, the Terrabin [Terabin] southwest from El Arish and the Teaha [Tiaha] southeast to Kosseima [Qusaima]. These tribal Beduin are all of the same stock of course, but there is what one might call a family resemblance so that in many, but not all, cases I used to be able to guess a man's tribe from his looks.

The Bayyadin around Romani are interesting since they are nearly all about six feet and can grow full beards which the true Beduin Arab cannot. I should say -- I haven't the slightest proof of this as it is only a vain imagining -- that they may be descendants of some Europeans that the Romans brought out in one of their foreign legions.

The peoples who live along the actual coast in the villages are the biggest mixture in the world. They are not Arab in the Beduin sense. I should say there is possibly a fair amount of the old Phillistine in them and since then every race from the Middle East plus the Crusaders, Napoleon's French and possibly Australia has made an impact on them.

In December, 1925, Dr. L. H. Dudley Buxton and I found the first typologically Paleolithic implements between the River Jordan and the Iranian Plateau. This was the first proof, later clearly established³³ during the Field Museum North Arabian Desert Expeditions, 1927-1928 and 1934, that man in a Paleolithic phase of culture migrated across this now inhospitable wilderness, previously considered a geographic barrier.

During the past twenty-six years³⁴ I have traced the path of Stone Age man from the Wadi Araba in southwestern Jordan northeastward across the North Arabian or Syrian Desert in Jordan and Iraq into the passes of Zakho, Aqra, Rowandiz, and Sulaimaniya leading to the Iranian Plateau and then to the Central Caucasus.

The missing link in this cultural chain was Sinai -- land bridge between Asia and Africa. This peninsula really stands near the juncture of Eurafasia.

Irrespective of the direction of prehistoric migrations, I predicted that in northern Sinai, from the Suez Canal to the Palestine border, typologically Stone Age implements would be found on the surface.

Theoretically, those nearest the canal should show affinities with the prehistoric cultures of the Nile Valley as far west as Kharga Oasis, and conversely those nearest the Palestine border should possess eastern cultural affinities.

Our preliminary survey proved these predictions even more accurate than anticipated. Before outlining our discoveries in December, 1947, and January, 1948, let us examine the results obtained by previous travelers and archaeologists.

In 1871 Palmer referred to flint implements found on hillsides in the Wilderness of Tih.

In 1906 Currelly (in Petrie, p. 227) described Paleolithic flints from a small wadi bed in the Gaa Desert as follows: "I soon chanced upon a very good implement (Fig. 163). We picked up many others, all of which were much the worse for wear. One of the men came upon four flakes about five inches long that fitted together; the edges were unrubbed, and they lay within a few yards of each other. Sir John Evans considers that

these could not possibly be called Paleolithic, but that no one could say they were not, as the patina was very rich. . . . What I saw later confirmed me in the view that there had practically been no climatic change during the period in which Neolithic man had been in Sinai."

Currelly (in Petrie, p. 267) describes how on the Plateau of Tih "are thousands of flakes and implements from Paleolithic times. The flint seems to be good, and there are quantities of large pieces; yet the implements are all small and of decidedly poor workmanship. The majority have the orange patina well-known on Libyan flints. One or two flints were of the regular celt pattern, but the majority were small scrapers. Flakes that would join together were by no means rare, and it looked as if the surface had remained undisturbed since they had been struck."

In 1913 and 1914 Woolley and Lawrence made a six-week archaeological reconnaissance survey of northeastern Sinai, especially in the region of Ain Kadeis (Map 2 in Woolley and Lawrence). Their objectives³⁵ were: to obtain some idea of the country in successive periods; to trace the Darb el-Shur, the old inland route of caravans from central Palestine to Egypt; to identify sites mentioned in the Bible and other historical writings; and to study the region of Ain Kadeis, supposed to be the Kadesh-Barnea of the Israelite wanderings.

Since this monograph does not exist in most libraries, I quote at some length the relevant passages and include summaries from pp. 18-38:

In writing the history of Northern Sinai we are at once met by a great difficulty, the absence of significant references to the country in early records. This, of course, in its not very satisfactory way, gives an exact indication of the importance of the country in that time. It was a roadway at best, and a very unpleasant one. Travellers passing from Egypt to Syria by land all had to traverse it, and they went, as they do to-day, by the El Arish road if the governments were favourable, and by the Hebron-Beersheba-Muweilleh roads in other cases. The Egyptians, the Patriarchs, the Jews, the Romans, the Crusaders and the Arabs all passed over these tracks, and they have given us place-names and no more. Probably in their eyes the country was too

detestable to merit further reference, and by their default our notes on the history of the desert have to be compiled from the remains of occupation preserved in the country itself. By good fortune Sinai lends itself to such research, for everything that has ever been made in the desert is kept for ever for all to see. The careless traveller who piles up four stones in a heap by the roadside here erects an eternal monument to himself.

In the books of our predecessors the pre-historic age is the most fertile in material remains in the Negeb. They make constant reference to flint implements, and to cairns and graves and dwelling-houses of the Stone Age. Palmer even saw in the stone-heaps of Muweilleh a great city of the prehistoric period, and has no hesitation in describing as Neolithic the stone circles of Ras Seram and other places. Holland³⁶ traced ancient roads across the desert by the heaps of flint arrowheads lying on either side. Only Lord Kitchener thought that some of the cairns must be of comparatively recent and Arab origin.³⁷

Now we have searched for stone implements over the whole face of the country, and have found very few. We brought away the four or five we found, and also a representative collection of flints so chipped that they might well be mistaken for results of human industry, while, in fact, they were found in circumstances which made any but a natural origin ludicrous. The land is a land of flints: on all hill-slopes the exposed edges of the limestone have been eaten away by the wind, and the flints of the alternate layers have slipped forward until the slopes are red with them. The nodules in these strata are usually cracked into numberless pieces that still cling together; others have been splintered and scattered before the stone formed around them. On every yard of ground, and even out of the broken nodules that still hold together in their matrices, one can pick up what might well pass as worked flints. We chose our selected pieces carefully from such impossible places, and in England have succeeded

in deceiving with them several good authorities on flints by presenting these, so to speak, without context.³⁸ Were these genuine, a little patience only would be required to collect from any one hill-side such an array of primitive weapons as would sink a battleship. It was this abundance of nature, rather than the extravagance of primitive man, which made ancient roads so easy for Mr. Holland to follow. Of the four or five real stone implements which we found, one came from Wady Ain el-Guderat near the threshing floor, and all the others from Tell el Seram, a conspicuous natural hill in the middle of a wady south of Auja. We have no means of dating the Guderat flint, but those from Tell el Seram were found in and about the drift-sand which filled stone hut-ruins on the hill-top, together with quantities of broken pottery of the Byzantine period. Everything points to the potsherds and the flints being contemporary. The peasants of the Byzantine Age were presumably as resourceful as those of to-day, and to-day throughout all Syria flint instruments are freely used. The teeth of chaff-cutting instruments are always small pointed flakes of flint properly struck from a core. Oval "scrapers" are used by shepherd-boys to shear the sheep, ousting, in many cases, the iron shears to which European commerce gave a brief vogue, and straight heavy knives, often a foot or more in length, are made in any emergency for hacking to pieces a dead animal. Zeyd, Mr. Holland's guide, knapped a flint when he wanted to trim his toe nails,³⁹ and sometimes a flint razor is still used for shaving the head. In all cases the implement is used upon the one occasion and then thrown away. To date such castaways is difficult, for the brown patina of Sinai takes only a few years to produce; flints lying on modern Arab graves are a beautiful brown on the exposed side and quite white underneath. Any man at any period may knap and use a flint, especially when there is such profusion of raw material, and one cannot from the casual product of his industry argue a Stone Age in the exclusive sense of the term.

In our opinion all flint evidence tends to show that man had emerged from the historic Stone Age long before he tried to live in the Negeb.

Great quantities of stone circles and cairns still exist in Sinai. In our part they are not equally distributed, but are most common between El Auja and Wady Lussan, and in the hill country to the south of Beersheba. They are rare to the south of a line drawn from Wady Lussan to Jebel Harun. Of all sorts and sizes, they are built of rough unshaped boulders or blocks of limestone, interspersed with large lumps of flint, and they are nearly always placed upon rising ground, often upon the tops of the most prominent hills. We have visited a great number of these and dug out a fair number, and the conclusion at which we have arrived is that in all probability none of them go back to the prehistoric Stone Age; that a small number of them, in certain districts, are as old as the middle of the second millennium B.C.; that from that date to the present time such monuments have been erected by the nomad population of the country, and that of those now existing few are older than the Byzantine period, and the vast majority are comparatively modern. Believing these conclusions to be correct we must none the less put in a word of caution regarding them. These structures conform to a tradition, as will be shown later, singularly consistent; their workmanship is, *ex hypothesi*, primitive in character, and their material is necessarily identical at all periods. Even with careful examination it is generally difficult and often impossible to fix the approximate date of any one cairn.

Stone Monuments. -- These were classified by Woolley and Lawrence (pp. 21-23) as follows: ring graves, rectangular graves, chamber tombs, round shelters, rectangular shelters or houses, sheep pens, Dead Man's piles (*makatal*), memorial heaps (*shehadat*), ritual heaps;⁴⁰ roadside heaps, boundary or guide heaps, and "trig-points" of survey under Captain (now Colonel) F. S. Newcombe.

Woolley and Lawrence (p. 27) conclude as follows:

We therefore believe that the Stone Age proper has left no monuments in the country, which in that remote period was uninhabited. The first signs of human occupation that we find are the shelters and graves of the poverty-stricken nomad folk that huddled round the scanty water of the Muweilleh springs. Their houses seemed never to have been rebuilt, and by the look of the remains they had been inhabited only for a short period. Some unknown local conditions must have persuaded people to live here for a little while.

In fact, roughly speaking, the dawn of history in the southern part at least of this district seems, so far as its remains go, to coincide with the first efforts of Egypt to conquer Syria. The Tells that dot the northern fringe of the country with which our survey is concerned may well go back to a date far more remote than this; the way from Hebron by Raheiba and the spring of Muweilleh down to Egypt was a path well worn by the patriarchs long before the Pharaohs of the XVIIIth dynasty marched to the Philistine plains; but only when the relations of Egypt and Syria had already established a steady stream of traffic along the northern desert routes do there appear the least traces of permanent dwellings in the inhospitable south.

In the following paragraphs (pp. 27-38) these authors describe the occupation of Ain el-Guderat during the latter half of the second millennium B.C. Then followed the Nabatean and Byzantine periods and the subsequent trade with the Far East. Woolley and Lawrence (p. 30) write:

From Ceylon and the Indian ports and South Arabia came cargoes of spices and emeralds and silks to Aila and the other Red Sea ports, and passed thence by land over the desolate hills of our part of Sinai, either to Gaza for shipment to Greece or to the opulent cities of North

Syria. And this latter route was at once cheaper and more secure than the long northern journey over the Mongolian desert. In consequence at various times (notably in Justinian's reign) we find the Byzantine Government fostering this trade, whose effects are still plainly visible along the road.

The Arab conquest became the penultimate phase.

In 1931 Jarvis (p. 102) wrote:

Flint arrowheads, scraping-knives, etc. lie thick all over the plateau of Central Sinai, so thick, in fact, that one may gather a sackful in a day's march; and it was this extraordinary profusion that convinced the Palestine Exploration Party of 1913-1914 that ninety-nine out of a hundred were naturally chipped by the action of the weather and that the remaining one per cent were of present-day origin, as the Arab, if he has forgotten his knife, will always knap a flint to skin and cut up an animal, and also shapes and maintains a supply with which to light his pipe.⁴¹

Since summaries of our finds of 1947 and 1948 have already been published,⁴² further detailed recapitulation is unnecessary here. For convenience, the following chronological sequence and geographical arrangement have been followed:

PALEOLITHIC

North. -- 1. In the bed of the Wadi el-Arish near Magdhaba between El Arish and Abu Aweiqileh, I found several rolled and a few unrolled flakes.

2. At Er Rawafi⁴³ (El Rawafa), two miles east of Abu Aweiqileh, a superb Lower Paleolithic station was found by Huzayyin, Albright, and me. This is one of the most important surface stations in Southwestern Asia. Of particular significance were the deeply patinated surface flint implements found during 1935 in the El Qusaima (El Kossaima) region,⁴⁴ some fifteen miles to the south-east, by the Abbé Henri Breuil.⁴⁵

Central. -- 1. North of Bir Hasaneh, some deeply

patinated flakes were collected.

2. Two air miles northwest of Bir Hasaneh, and on a flint-covered crest south of the Bir Hasaneh-Wadi el-Letheili track, I found a station rich in heavily patinated flakes, scrapers, and cores.

3. Between Bir Hasaneh and Nekhl, former capital of Sinai, I collected a few scattered flint flakes.

4. At Mile 57 from Nekhl toward El Shatt, I found a coup-de-poing of Acheulian type. During the next six miles, Huzayyin, the Guftis, and I found a few implements and numerous flint flakes.

Southwest. -- 1. On a low chain of black mounds bordering the northern bank of the Wadi Khreizeh, flint implements, including some delicately retouched side scrapers, were collected.

2. About three miles from the entrance to the Wadi Babaah, large, heavily patinated flint flakes, with clear bulbs of percussion, were found. Later, a fine series of scrapers, flakes, and rejects was assembled.

NEOLITHIC-CHALCOLITHIC

North. -- 1. On December 19, 1947, two miles south of Kilometer 156, on the Ismailia-Abu Aweiqileh paved road and on the sandy track toward Bir Hasaneh, Albright found a Neolithic station located on the gravelly surface of the rolling plain between areas of sand. Here were flint blades and two-edged knives as well as a fine tanged spearhead; some heavily patinated flints were also found. All showed evidence of weathering agents, especially aeolian action.

2. Near Kilometer 115, east of Ismailia and north of the paved road leading to Palestine, Huzayyin and I found, near the western end of Jebel el-Magharah, a fine series of microlithic crescents bearing delicate retouches. These lunates were collected within an area of about ten square meters, indicating a Mesolithic workshop. These were probably used as tips for reed shafts serving as arrows. The entire series of flint implements from this station ranged apparently from Natufian to Predynastic, with the preponderance of affinities westward toward the Nile Valley -- directly in accord with our prediction.

Central. -- No evidence was found, except possibly in the area between Miles 57 and 63 from Nekhl toward

El Shatt in the Wadi Bir Hisn east of Jubeil Hisn. This area requires careful searching, especially in the zone around the well just north of the track.

Southwest. -- 1. No evidence was found by us.

2. G. W. Murray, in a private communication dated January 27, 1948, wrote: "On the surface of the coating of gravel covering the so-called 'lake terraces' in Wadi es-Sheikh (the upper lot near Tarfet el-Gidarein) in 1934 Stanhope White, then a Cambridge undergraduate with one of my expeditions in Sinai, found a 'Neolithic-adze' which Mr. Henri Munier, formerly librarian of the Cairo Museum, called similar to some found at Beirut."

3. Albright (1948a, pp. 9-10) writes:

Such finds in a region where wide stretches of sand are interspersed with smaller areas of exposed rolling plain, strewn with gravel and flint, suggest the following explanation. During the millennia which have elapsed since the end of the Palaeolithic Age, the sand shifted hither and thither over the plain, now exposing one tract, now another. Such exposed sites as were suitable for the manufacture of flint artifacts were used for the purpose. In the following periods they might be covered again with sand and could not be used for this purpose any longer. Hence we find the curious phenomenon of transitory use of suitable sites in this region. After the displacement of flint by copper for use in weapons and tools during the course of the Chalcolithic and Early Bronze, characteristic flint artifacts became increasingly rare. Hence the flint criterion of age becomes practically useless for later periods, though it still retains some value in the south, for special reasons (use of stone picks and gouges for mining turquoise, etc.).

4. In a rock shelter (abri-sous-roche) on the northern side of the Wadi Khreizeh, a tributary of the great Wadi Feiran, I found a small hoe (or possibly an adz), scrapers, and hammerstones. Near the entrance lay a heavy, round basalt pounder of the type used by the ancient Egyptian miners and probably left behind on their way to Serabit el-Khadem or to the turquoise mines in the —

Wadi Muqattab. Trial trenches revealed neither tools nor pottery beneath a thick crust of stalagmite, only charred debris indicating the use of this shelter from Chalcolithic to recent times.

PREDYNASTIC TO RECENT

North. -- 1. Southwest of El Arish, in the foothills of the Risan Aneiza, some Roman sherds of the third or fourth century were obtained. Over a small crest lay a Roman pavement (lithostroton), with trimmed blocks of stone covering an irregular area of about three hundred square meters.

2. Some Arab and recent Turkish sherds (gray ware often ornamented with wavy lines) were collected from the surface of a low hill in the Risan Aneiza.

Central. -- Some sherds and a bright blue bead were found near Mile 57 from Nekhl toward El Shatt in the Wadi Bir Hisn east of Jubeil Hisn.

Southwest. -- 1. Five kilometers south of Abu Zeneimeh, on the Plain of Merkhah,⁴⁶ trial trenches sunk by Albright yielded pottery attributed to the period 1500 B.C. Albright determined this to be the port used by the ancient Egyptian miners. Since the lowest part of the mound lies only 2 meters above present sea level, this proves conclusively that the Red Sea has not risen⁴⁷ during the past 3,400 years. Hence it can now be stated with certainty for the first time that the level of the Gulf of Suez has not risen since 1500 B.C., and, as a corollary, that the Red Sea and Great Bitter Lake remained unconnected by water. This confirms the increasingly held view that the route of the Exodus⁴⁸ crossed the northern Isthmus of Suez. Apparently Moses led the hosts of Israel eastward to the south of Lake Menzaleh across the "Sea of Reeds" (Hebrew: Yam sūph), which became impassable for Pharaoh's heavy chariots. At the right moment an east wind blew (Exodus 14: 21), and the miracle was complete.

2. At Feiran Oasis (ancient: Pharan), seventy-six kilometers southeast of Abu Zeneimeh, a representative series of Byzantine and early Arab potsherds was made.

3. Circular stone tombs (nawamis)⁴⁹ in the Wadi Solaf. The most detailed accounts⁵⁰ are given by Peet (1915, pp. 151-158), Petrie (1906), and Murray (1935). Peet described three types of buildings: domed tombs

(nawamis)⁵¹ tomb circles, and hut circles.

4. At Serabit el-Khadem (Lat. 29°1'14", Long. 33° 27'28", and altitude 735 meters above sea level) in a small wadi leading from the northern end of the temple, a collection was made of rolled picks and some scrapers from late predynastic and early dynastic times. These had been used by the Egyptian miners of turquoise for a period of several centuries from about 1500 B.C.

5. At Serabit el-Khadem, Albright studied the Proto-Sinaitic inscriptions in mines L and M and checked the texts in situ (see Albright 1948b).

6. Some of the well-known Nabatean inscriptions were photographed in the Wadi Muqattab, Wadi Sidreh, and Wadi Feiran.

SUMMARY

As a result of the University of California African Expedition, 1947-1948, evidence is now available that man in a Paleolithic phase of culture lived in northern, central, and southwestern Sinai. Thus, the chain of surface stations is now linked from the Suez Canal to the Caucasus.

In the Acheulo-Levalloisian cultural phase Paleolithic man migrated across the intercontinental land bridge between Africa and Asia. It cannot now be stated with certainty the direction of the flow, but in all probability it was in both directions.

Although such great streams as the Wadi el-Arish, Wadi Gharandel, Wadi Feiran, and the Wadi es-Sheikh flowed with water, the animals to be hunted must have been limited, thereby naturally reducing the number of hunters.

Future archaeologists will plot distribution maps of Paleolithic, Neolithic, and Mesolithic surface stations. Stratified deposits will also be found. The stone monuments within this peninsula will be studied and plotted by periods. The pottery will be classified and dated. The inscriptions will be copied and translated. The historical sites, such as Pharan, will be excavated.

Finally, it will be possible to show the cultural position of Sinai through the millennia in relation to Egypt, Palestine, Jordan, Saudi Arabia, both sides of the Red Sea coast, and the Mediterranean area. The influences on Sinai from the Far East, India, Central Asia, and Europe will also be shown.

Sinai was indeed the land bridge between Asia and Africa or Africa and Asia and between Eurasafrica.

In general, the anthropometric methods and technique follow the procedure adopted by the International Committee at Monaco in 1906. A detailed description of the technique and a list of the abbreviations have appeared (pp. 278-288) in Field, 1939. During our limited time in Sinai every Beduin who would consent to the calipers was measured.

Areas. -- Northeast, central, and southwest Sinai. A small group (22) was studied near Suez.

Tribal Groups. -- The following 225 individuals were measured: Aleiqat (3), Badara (1), Billi (1), Ferayin (2), Heiwat (1), Jebeliyeh (73), Laheiwat (3), Muzeina (23), Nekhlawis (3), Qararsha (29), Sawalha (30), Terabin (23), Tiaha (22), and Wilad Said (11).

Tribal Notes. -- The following sections have been selected from Murray in order to give the approximate numerical strength and range of the larger tribes.

Aleiqat:⁵² -- This tribe, with 269 tents, forms one of the three main divisions of the Towara. They inhabit the coastal strip from Ayun Musa to Merkhah. Their Sheikh is Zeidan Mudakhil, whom we visited at Abu Zeneimeh.

Jebeliyeh. -- According to Murray (pp. 265-266), they are the descendants of some Bosnian and Wallachian serfs, given by Justinian to the St. Catherine's Monastery. They look after the extramural gardens of the monks, and some are employed in the monastery as servants. They are despised as Hiteim by the Arabs, who will not intermarry with them. Nassir Musa, the Sheikh of the Qararsha, to increase the importance of his small tribe, offered to remove this restriction during the World War I, but the concession, as might be expected, was repudiated by his tribesmen. In their dress and mode of living, the Jebeliyeh are in no way distinguishable from the other inhabitants of Sinai, although in features they preserve some trace of their foreign origin. The majority were converted to Islam in the seventh century by the Caliph Abd el-Malik ibn Merwan, but a few families remained Christian for a thousand years, the last of whom, an old woman, died in 1750.⁵³

About twenty-five years ago, the monks of St. Cathe-

rine's attempted to coerce, by stopping their daily ration of bread, the Jebeliyeh into giving up a garden they had acquired. The Jebeliyeh complained to the government when it was found that this daily ration went back to Justinian's time, and consequently had been established too long to be abrogated. An agreement was concluded which satisfied both parties.

The group suffered severely from the influenza epidemic after World War I, in 1929 totaling only 420 members, according to the Archbishop of Mount Sinai. Their Sheikh is Awda Masaud, with the following subdivisions: (1) Wilad Masaud; (2) Wilad Musaad; (3) Wiheibat; (4) Wilad Salim; (5) Heimat; and (6) Wilad Gindi.

Burckhardt says that the Tabana in the gardens of Feiran, the Beziya in the gardens of Tor, and the Sattila elsewhere are all offshoots of the Jebeliyeh. There are also Muatira at Tor.

Laheiwat. -- This is a section that, according to Murray (p. 248), has broken away from the Masauid division of the Beni Atiya and now forms a tribe of its own. Traditionally from Nejd, the main part ranges from Nekhl to Aqaba. They claim the wells at Kuntilla, Heisi, Themed, and Ghadian in Wadi el-Araba; and in the west, Ain Sudr and Jifjaffa.

Muzeina. -- Murray (p. 264) writes that this tribe, with 600 tents, are relatively recent arrivals in Sinai from the independent clan of Muzeina, powerful in early Arabia.

MacMichael⁵⁴ observes, "The tribes of the Arabs are seven, and whosoever is not included in them may lawfully be enslaved; these are: Kenana, Muzayna, Guhayna, Ashgaa, Himyar, Ghafar, Kuraysh."

Sir Richard Burton⁵⁵ writes of the Muzeina: "Anyone who knows the Badawin can see the Muzaynah are blue blood. Their brows are broad, their faces narrow, their features regular, and their eyes of a moderate size; whereas the other Tawarah (Sinaitic) clans are as palpably Egyptian."

Nekhlawis. -- Nekhl stands midway between Suez and Aqaba on the main Haj road. In ancient times it was important since a fortified castle dominated the water holes. Today Nekhl is still important on account of its wells and few small stores.

Murray (p. 160) writes:⁵⁶ "In the garden at Nekhl Fort (now deserted) was a very old zizyhus-tree which the inhabitants believed to be a weli, and on which they hung lights."

Qararsha. -- This tribe, owning the palm groves in Wadi Feiran, claim relationship with the Koreish (Quraish). In 1838 the Qararsha were excluded⁵⁷ as protectors (ghafirs) of St. Catherine's.

Sawalha. -- This confederation of the Awarma (59 tents), Qararsha (95 tents), and Wilad Said ([Wulud Sayyid] 88 tents) is of obscure origin. Murray (p. 259) states that the Sawalha came from Sharqiya Province northeast of Cairo (see Ammar, 1944).

Terabin (singular: Terbani). -- This tribe, of about 575, forms part of the Nabaat division of the great Terabin tribe, the most powerful in southern Palestine. In Sinai they range from Jebel el-Magharah through Magdhaba and Wadi Amr to the Palestine frontier north of El Qusaima.

Tiaha (singular: Tihi). -- During 1911 Parker estimated their number at 900 men. They claim to have been driven from the Hejaz by the Maaza. The majority live east of Beersheba in Palestine. In Sinai they range from Jebel el-Halal to Naqb er-Rakna and from Nekhl to Jubeil Hasan.

Towara (singular: Turi). -- This confederation of southern tribes, perhaps 750 tents, is united not by blood but merely by community of interest. Murray (pp. 256-257) continues: "Among themselves, they can distinguish each tribe and subtribe by their looks and dialects, but to a stranger the Towara seem much of a muchness, except that the Aleiqat, perhaps, are rather more like the North Sinai tribes."

TRIBAL SUBDIVISIONS OF THE TOWARA (After Murray)

Tribes	Tents	Subtribes
Sawalha.....	245	Awarma (59), Qararsha (95), Wilad Said (88)
Aleiqat.....	269	
Muzeina.....	600	

THE BEDUINS OF SINAI

The majority of our series were from the southern mountainous triangle, there being only thirty-nine Beduins from north of the escarpment. Since there appeared to be relative homogeneity among the Beduins, they have been grouped together with the exception of the Jebeliyyeh, whose origin was European.

Localities. -- On December 19, 1947, ten men were measured at Magdhaba between El Arish and Abu Aweiqileh. The following day eighteen were measured at Bir Hasaneh midway between Abu Aweiqileh and Nekhl. Ten men were measured at Nekhl on December 22. Two Terabin were measured on the following morning in the Wadi Ilmuthli, twenty miles east of Suez on the track from Nekhl to Shatt. On December 27, twenty-eight men, employed by a local sheikh in digging a well on the Merkhah Plain south of Abu Zeneimeh, were measured. On December 30, two Sawalha were measured near Sheikh Sulaiman Nafai's grave in the Wadi Sidreh. Later the same day four men were measured in the Wadi Feiran, and fifteen at Feiran Oasis.

On January 1, 1948, near Abu Rudeis on Merkhah Plain about eight miles south of Abu Zeneimeh, eleven Beduins were measured. Nine men were measured on January 7 in the Wadi Solaf. At St. Catherine's Monastery, from January 8 to 10, sixty-five men, mainly Jebeliyeh, were measured. On January 11, during the return trip to Abu Zeneimeh, we stopped at Abu Rian, a few miles south of Feiran Oasis; here eighteen men were measured. Later the same day, six Qararsha were measured at Feiran Oasis. Two Beduins were measured on January 16 near Serabit el-Khadem. The final series (22) was obtained on February 19 in the Wadi el-Ghal below Jebel Attaqa near Suez.

Recorders. -- The following persons recorded data on the anthropometric forms, an assistance for which I am deeply grateful: W. F. Albright (50), Raymond Ghanem (22) of the Suez Canal Company, S. A. Huzayyin (30), Ahmed Lutfi (37), Wendell Phillips (1), Gladys Terry (32), and Walter A. Thompson (25); the remaining twenty-six men I measured and recorded, always a most difficult procedure.

Age. -- The average age for 148 Beduins was 40.60 (range 18-65) years. One-quarter of the group were less than twenty-one, and nearly thirty per cent were more than fifty years old. On the basis of age grouping, the sample obtained should be a representative series of the Beduins of Sinai.

AGE DISTRIBUTION

Age	Per cent	Age	Per cent
18-19..... 11	7.43	45-49..... 23	15.54
20-24..... 6	4.05	50-54..... 22	14.86
25-29..... 20	13.51	55-59..... 10	6.76
30-34..... 16	10.81	60-64..... 11	7.43
35-39..... 17	11.49	65-69..... 1	0.68
40-44..... 11	7.43		
		Total.... 148	99.99

MORPHOLOGICAL CHARACTERS OF BEDUINS

Skin. -- The secondary shadings of different parts of the body were in no way peculiar, but the exposed parts were slightly darker than those habitually clothed. On the head, which is always covered, the skin was considerably lighter in many cases, but never as white as in northern Europeans. The majority possessed a brunet forehead and a brunet inner surface of the right arm. The following tabulations were made, based on the Harvard anthropometric form, on the color of the forehead: pink (2), brunet (100), swarthy (33), chocolate (1), and dark brown (2). The color of the inner surface of the right forearm was recorded in the same proportions. Two men were Negroid (Nos. 100 and 104).

Freckles. -- Eleven Beduins had a few freckles, and 125 had none.

Moles. -- Twenty-nine men had a few moles, two had many, and 103 had none.

Hair. -- The hair was dark brown in almost every case. In form, the hair had low waves, with almost one-third of the Beduins possessing deep wavy hair. The texture was medium, although some were in the coarse or fine categories. No. 216 had a shaven head except for a tuft (zaghla).

HAIR

Color	No.	Per cent
Black.....	2	1.43
Dark brown.....	135	96.43
White.....	3	2.14
Total.....	140	100.00

HAIR		
Form	No.	Per cent
Straight.....	0	.....
Low waves.....	102	74.45
Deep waves... ..	32	23.36
Curly.....	1	0.73
Frizzly.....	1	0.73
Woolly.....	<u>1</u>	<u>0.73</u>
Total.....	137	100.00

Texture	No.	Per cent
Coarse.....	20	14.71
Medium.....	98	72.06
Fine.....	<u>18</u>	<u>13.24</u>
Total.....	136	100.01

The head hair quantity was recorded as follows: some (34), average (66), double plus (26), and triple plus (4). Baldness was observed: absent (76), some (24), plus (24), and double plus (10). Grayness was observed: absent (62), some (38), plus (37), and double plus (3).

Beard or mustache color was recorded as dark brown in 135 men (96.43 per cent), white in three, and black in two Beduins. Beard quantity varied: slight (55), some (18), plus (41), double plus (21), and triple plus (5). Grayness was observed: absent (66), some (38), plus (34), and double plus (2).

Body hair was recorded: absent (42), some (29), plus (19), and double plus (6). Abnormal hairiness was not observed. The general impression retained was that the Beduins of Sinai had about the same amount of body hair as the Anaiza and Shammar Beduins of Iraq (see Field, 1940 and 1951b).

Handedness. -- No cases of left-handedness or ambidexterity were observed.

Eyes. -- With but one exception, the Beduins possessed brown eyes, the majority (85 per cent) being dark brown. The presence of twenty-one Beduins with mixed eyes indicates a minor element of submerged blondism. The majority of the irises were clear, but one-third were in other categories.

EYES

Color	No.	Per cent
Black.....	0	.....
Dark brown.....	119	85.00
Dark light brown.....	1	0.71
Green-brown.....	17	12.14
Gray-brown.....	1	0.71
Light brown.....	1	0.71
Blue-gray.....	1	0.71
Total.....	140	99.98

Iris	No.	Per cent
Clear.....	109	78.42
Rayed.....	2	1.44
Zoned.....	7	5.04
Spotted.....	21	15.11
Total.....	139	100.01

Nos. 56 and 80 were blind in the left eye; No. 41 in the right. Nos. 36 and 48 had blue-ringed sclera. Vision was poor in both eyes for No. 7 (age 60), No. 27 (age 33), No. 122 (age 50), and No. 220 (age 55); in the right for Nos. 68 and 73, and left for No. 23. Cataracts were recorded in the left eye of No. 23, in the right of No. 73, and in both of No. 112.

The eyes -- or more properly, the eye slits -- were horizontal as in Europeans. In general, the eyes were clear and the vision keen, features characteristic of the nomads of Southwestern Asia.

Eyebrow Concurrence. -- The following was observed: absent (19), some (54), plus (61), and double plus (5).

Browridges. -- The grouping was as follows: absent (0), small (9), average (112), double plus (7), and triple plus (0).

Nose. -- The majority of the nasal profiles were convex, the next largest group being straight. The alae were medium, with the remainder almost equally divided between the compressed and flaring categories, the latter undoubtedly associated with the presence of Negro blood. The nasal tip was recorded: small (34), average (88), double plus (12), and triple plus (1).

NOSE

Profile	No.	Per cent
Wavy.....	3	2.13
Concave.....	17	12.05
Straight.....	39	27.66
Convex.....	<u>82</u>	<u>58.15</u>
Total.....	141	99.99

Wings	No.	Per cent
Compressed.....	18	14.17
Compressed-medium.....	0	.....
Medium.....	94	74.02
Medium-flaring.....	14	11.02
Flaring plus.....	<u>1</u>	<u>0.79</u>
Total.....	127	100.00

Mouth. -- The majority of the lips were slightly thicker than those of the average European. The integumental area was recorded as follows: small (3), average (96), and double plus (1). The lower lip was observed: small (0), average (1), double plus (80), and triple plus (14).

Teeth. -- Eruption was recorded as complete in 71 and partial in 16. Crowding was observed: absent (110), plus (15), and double plus (1). The occlusion was normal in the majority of cases, but one-third possessed marked overbite. The wear and number of teeth lost indicated relatively good teeth, although their proximity to El Arish, Magdhaba, Ismailia, Suez, Abu Zeneimeh, and Tor must be beginning to take its effect because at these points sugar may be obtained, although it was rationed in 1948. Furthermore, canned food may be purchased at the big centers. Sugar and canned food have proved to be the greatest deteriorators of teeth. The wear was normal, but No. 222 (age 50) was recorded in the triple-plus category. When I commented on this, he replied: "My teeth are bad because I eat so many balah dates." The condition was observed as excellent in No. 26 (age 35) and No. 47 (age 18), and good in No. 209 (age 40) and No. 91 (age 60). No. 25 had one front gold tooth. No. 72 had widely spaced front teeth. No. 35 (age 48) had front teeth projecting over his lower lip, and consequently was a mouth-breather.

TEETH

<u>Bite</u>	<u>No.</u>	<u>Per cent</u>
Under.....	0	.....
Edge-to-edge.....	3	2.44
Slight over.....	88	71.54
Marked over.....	<u>32</u>	<u>26.02</u>
Total.....	123	100.00

<u>Loss</u>	<u>No.</u>	<u>Per cent</u>
None.....	47	34.56
Few.....	39	28.68
Some.....	21	15.44
Plus.....	15	11.03
Double plus.....	<u>14</u>	<u>10.29</u>
Total.....	136	100.00

<u>Wear</u>	<u>No.</u>	<u>Per cent</u>
Absent, some.....	56	42.42
Plus.....	37	28.03
Double plus, triple plus.....	<u>39</u>	<u>29.55</u>
Total.....	132	100.00

The following notes were made on the number of teeth lost: all (No. 33, age 62; and No. 39, age 60); all but one (No. 43, age 60); all but two (No. 173, age 45; No. 98, age 45); all but three (No. 24, age 50; No. 112, age 50); and all upper teeth (No. 67, age 60).

Ears. -- The lobe was soldered (7), attached (132), or free (2). The size was very small (2), small (7), average (108), and double plus (23). The protrusion was recorded as: small (5), average (117), and double plus (20).

Musculature and Health. -- The Beduins of Sinai had well-developed musculature, and the majority were in good health.

Anomalies. -- No. 192 was deaf and dumb.

Disease. -- Favus was observed on Nos. 27, 52, 62, 71, 75, and 76.

Scar. -- No. 66 had a deep scar on his forehead.

Tattooing. -- No. 175, a Terbani examined at St. Catherine's Monastery, had on each temple three parallel

bars surmounted with three dots.

Branding. -- No case was seen.

Kohl. -- No example seen.

Summary. -- The average Beduin of Sinai had a brunet skin, dark brown, low-wavy hair of medium texture. The eyes were dark brown with clear sclera. The nose was convex or straight with medium alae. The lower lip tended to be everted. The teeth, musculature, and health were good.

STATISTICAL ANALYSES OF BEDUINS OF SINAI

Half the group were medium tall (160.0-169.9), the mean being 165.72 (range 151-181), which is very close to the mean for Southwestern Asia. The small standard deviation shows a remarkable homogeneity.

STATURE

<u>Harvard System</u>	No.	Per cent
Short (x-160.5).....	14	20.90
Medium (160.6-169.4).....	33	49.25
Tall (169.5-x).....	<u>20</u>	<u>29.85</u>
Total.....	67	100.00

<u>Keith System</u>	No.	Per cent
Short (x-159.9).....	14	20.90
Medium (160.0-169.9).....	34	50.75
Tall (170.0-179.9).....	18	26.87
Very tall (180.0-x).....	<u>1</u>	<u>1.49</u>
Total.....	67	100.00

Minimum Frontal Diameter. -- The head was wide, with twelve men in the very wide category. No Beduin had a very narrow head. The mean was 113.78 (range 103-128).

MINIMUM FRONTAL DIAMETER

<u>Group</u>	No.	Per cent
Very narrow (x-99).....	0	.....
Narrow (100-109).....	25	16.67
Wide (110-119).....	113	75.33
Very wide (120-x).....	<u>12</u>	<u>8.00</u>
Total.....	150	100.00

Head Breadth. -- The head was wide or narrow. The mean was 139.72 (range 130-158).

HEAD BREADTH

Group	No.	Per cent
Very narrow (120-129).....	0	.....
Narrow (130-139).....	72	48.00
Wide (140-149).....	71	47.33
Very wide (150-x).....	<u>7</u>	<u>4.67</u>
Total.....	150	100.00

Cephalic Index. -- According to the Harvard system the majority (84.00 per cent) were dolichocephalic, with only one brachycephal in the series.

The Keith classificatory system reveals that the Beduins of Sinai were dolichocephalic, with a strong tendency toward ultradolichocephaly.

The mean head length was 193.74, which, combined with the relatively narrow breadth (139.72), gave a cephalic index of 72.35, -- a figure I believe to be close to that of the Proto-Mediterranean mean.

CEPHALIC INDEX

Harvard System	No.	Per cent
Dolichocephalic (x-76.5).....	126	84.00
Mesocephalic (76.6-82.5).....	23	15.33
Brachycephalic (82.6-x).....	<u>1</u>	<u>0.67</u>
Total.....	150	100.00

Keith System	No.	Per cent
Ultradolichocephalic (x-70.0).....	46	30.67
Dolichocephalic (70.1-75.0).....	80	53.33
Mesocephalic (75.1-79.9).....	22	14.67
Brachycephalic (80.0-84.9).....	2	1.33
Ultrabrachycephalic (85.0-x).....	<u>0</u>	<u>.....</u>
Total.....	150	100.00

Facial Measurements and Indices. -- The upper part of the face tended to be long (70+), but 43.33 per cent were below this arbitrary figure. The largest groupings were

either medium short or medium long. The mean was 70.95 (range 54-117).

The total facial length also tended to be long (120+). The mean was 120.25 (range 68-141).

A grouping of the facial indices places 60 per cent in the leptoprosopic category, whereas 14.67 per cent were euryprosopic.

FACIAL MEASUREMENTS

Upper Facial Height	No.	Per cent
Short (x-63).....	12	8.00
Medium short (64-69).....	53	35.33
Medium long (70-75).....	52	34.67
Long (76-x).....	<u>33</u>	<u>22.00</u>
Total.....	150	100.00

Total Facial Height	No.	Per cent
Short (x-109).....	12	8.00
Medium short (110-119).....	54	36.00
Medium long (120-129).....	68	45.33
Long (130-x).....	<u>16</u>	<u>10.67</u>
Total.....	150	100.00

TOTAL FACIAL INDEX

Group	No.	Per cent
Euryprosopic (x-84.5).....	22	14.67
Mesoprosopic (84.6-89.4).....	38	25.33
Leptoprosopic (89.5-x).....	<u>90</u>	<u>60.00</u>
Total.....	150	100.00

Nasal Measurements and Indices. -- The Beduins of Sinai possessed noses medium in height, medium wide or medium narrow, and a leptorrhine or mesorrhine index. The mean height was 54.86 (range 41-65), the breadth 36.65 (range 29-49), and the nasal index 66.86 (range 48-100).

NASAL MEASUREMENTS

Nasal Height	No.	Per cent
Short (x-49).....	14	9.33
Medium (50-59).....	121	80.67
Long (60-x).....	<u>15</u>	<u>10.00</u>
Total.....	150	100.00

Nasal Breadth	No.	Per cent
Very narrow (x-29).....	2	1.33
Medium narrow (30-35).....	49	32.67
Medium wide (36-41).....	91	60.67
Wide (42-x).....	<u>8</u>	<u>5.33</u>
Total.....	150	100.00

NASAL INDEX

Group	No.	Per cent
Leptorrhine (x-67.4).....	91	60.67
Mesorrhine (67.5-83.4).....	55	36.67
Platyrrhine (83.5-x).....	<u>4</u>	<u>2.66</u>
Total.....	150	100.00

To furnish additional statistical material for comparison with my published data on Iran and Iraq, the following tables have been calculated:

MEASUREMENTS OF SINAI

Head Breadth	Minimum Frontal Diameter				Totals	
	x-99 No. %	100-109 No. %	110-119 No. %	120-x No. %	No.	%
120-129.....	0 0	0 0	0 0	0 0	0 0	
130-139.....	0 0	17 11.33	54 36.00	1 0.67	72 48.00	
140-149.....	0 0	8 5.33	54 36.00	9 6.00	71 47.33	
150-x.....	0 0	0 0	5 3.33	2 1.33	7 4.67	
Totals.....					150	100.00

Biszygonic Breadth

Total Facial Length	x-124		125-134		135-x		Totals	
	No.	%	No.	%	No.	%	No.	%
x-114.....	1	0.68	18	12.16	9	6.08	28	18.92
115-124.....	3	2.03	45	30.41	23	15.54	71	47.97
125-x.....	1	0.68	22	14.86	26	17.57	49	33.11
Totals.....							148	100.00

Upper Facial Length

Total Facial Length	x-63		64-69		70-75		76-81		82-x		Totals	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
x-109.....	5	3.40	4	2.72	2	0.68	0	0	0	0	10	6.80
110-119.....	6	4.08	26	17.69	17	11.56	4	2.72	0	0	53	36.05
120-129.....	0	0	21	14.29	29	19.73	18	12.24	0	0	68	46.26
130-x.....	0	0	1	0.68	5	3.40	9	6.12	1	0.68	16	10.88
Totals.....											147	99.99

Nasal Width

Nasal Length	x-29		30-35		36-41		42-x		Totals	
	No.	%	No.	%	No.	%	No.	%	No.	%
x-49.....	0	0	8	5.33	4	2.67	2	1.33	14	9.33
50-59.....	1	0.67	38	25.33	76	50.67	6	4.00	121	80.67
60-x.....	1	0.67	3	2.00	11	7.33	0	0	15	10.00
Totals.....									150	100.00

MEASUREMENTS AND INDICES OF SINAI NEGROES

Measurements	No.	Range	Mean	S. D.	C. V.
Age.....	148	18-65	40.60 ± .73	13.15 ± .51	32.38 ± 1.27
Stature.....	67	151-181	165.72 ± .55	6.69 ± .39	4.04 ± .24
Head breadth.....	150	130-158	139.72 ± .30	5.34 ± .21	3.82 ± .15
Head length.....	150	173-213	193.74 ± .35	6.33 ± .25	3.27 ± .13
Minimum frontal diameter....	150	103-128	113.76 ± .25	4.52 ± .18	3.97 ± .16
Biszygonic diameter.....	150	117-144	132.80 ± .29	5.25 ± .20	3.95 ± .16
Bigonial diameter.....	150	93-121	109.14 ± .30	5.56 ± .22	5.09 ± .20
Total facial height.....	150	68-141	120.25 ± .49	8.90 ± .34	7.40 ± .29
Upper facial height.....	150	54-117	70.95 ± .36	6.60 ± .26	9.30 ± .36
Nasal height.....	150	41-65	54.86 ± .22	4.00 ± .16	7.29 ± .28
Nasal breadth.....	150	29-49	36.65 ± .18	3.15 ± .12	8.59 ± .34
Ear length.....	142	36-72	58.65 ± .35	6.25 ± .25	10.62 ± .42
Ear breadth.....	142	26-43	35.33 ± .19	3.36 ± .13	9.51 ± .38
Indices					
Cephalic.....	150	63-83	78.35 ± .19	3.42 ± .13	4.73 ± .18
Fronto-parietal.....	150	67-89	81.22 ± .20	3.69 ± .14	4.54 ± .18
Zygo-frontal.....	150	67-93	85.58 ± .20	3.60 ± .14	4.21 ± .16
Zygo-gonial.....	150	65-95	82.06 ± .22	3.96 ± .16	4.83 ± .19
Total facial.....	150	56-107	91.05 ± .37	6.70 ± .26	7.36 ± .28
Upper facial.....	150	44-89	53.30 ± .28	5.04 ± .20	9.46 ± .37
Nasal.....	150	48-100	66.86 ± .40	7.20 ± .28	10.77 ± .42
Ear.....	142	41-108	60.54 ± .46	8.15 ± .32	13.47 ± .54
Cephalo-facial.....	150	81-104	95.06 ± .22	4.02 ± .16	4.23 ± .16
Fronto-gonial.....	150	83-111	96.05 ± .27	4.95 ± .20	5.15 ± .20

THE JEBELIYEH OF SINAI

The majority of the seventy-three Jebelieh were measured at St. Catherine's Monastery at the foot of Mount Sinai. Father Nile encouraged these servants of the Monastery to submit to the calipers and examination. This group has been kept apart from the Beduins of Sinai because by tradition the Jebelieh were of European origin some fifteen hundred years ago. However, in general dress and outward custom the Jebelieh appear to be like Beduins, who refuse to permit intermarriage between them. In other places we have given the account of their origin, arrival at the Monastery, and history there. The majority were studied in the courtyard outside St. Catherine's on January 8-10, 1948.

Age. -- The average age for the group was 38.85 (range 18-70). About one-third were less than twenty-five, and another third were more than fifty years old. The wide range should yield a representative sample.

AGE DISTRIBUTION

Age	No.	Per cent	Age	No.	Per cent
18-19.....	11	15.07	45-49.....	10	13.70
20-24.....	6	8.22	50-54.....	5	6.85
25-29.....	8	10.96	55-59.....	4	5.48
30-34.....	3	4.11	60-64.....	3	4.11
35-39.....	10	13.70	65-69.....	1	1.37
40-44.....	8	10.96	70-74.....	4	5.48
			Total...	73	100.01

MORPHOLOGICAL CHARACTERS OF JEBELIYEH

Skin. -- The protection from the sun of the great stone walls of the Monastery tend to give the skin a pallid appearance. Although it is often bitterly cold at this 5,000-foot altitude, the strong and steady wind and sand of the desert do not have an opportunity to tan the skin. The secondary shadings of different parts of the body were in no way peculiar, but the exposed parts were very slightly darker than those habitually clothed. On the head, which is always covered, the skin was considerably lighter, often as white as in Europeans. Three Jebelieh appeared to possess some Negroid blood.

The skin color of the forehead and of the inner surface of the right arm was recorded as follows: brunet (59), swarthy (12), and dark brown (2).

Freckles. -- The following were observed: absent (58), few (7) and many (0).

Moles. -- The majority (42) had some, four had none, and twenty-four had many.

Hair. -- The hair of the head, beard, or mustache was dark brown or white. In form the hair had low waves or deep waves, although nine men had curly or frizzly hair suggesting Negroid blood. The texture was medium or fine.

HAIR

Color	No.	Per cent
Black.....	0	.....
Dark brown.....	61	83.56
White.....	<u>12</u>	<u>16.44</u>
Total.....	73	100.00

Form	No.	Per cent
Straight.....	0	.....
Low waves.....	53	73.61
Deep waves.....	10	13.89
Curly.....	8	11.11
Frizzly.....	1	1.39
Woolly.....	<u>0</u>	<u>.....</u>
Total.....	72	100.00

Texture	No.	Per cent
Coarse.....	4	5.63
Medium.....	42	59.15
Fine.....	<u>25</u>	<u>35.21</u>
Total.....	71	99.99

The quantity of head hair was observed as: some (15), average (33), double plus (16), and triple plus (2). Baldness was absent (35), some (19), plus (8), and double plus (3). Beard quantity was very slight (26), some (12), plus (20), double plus (11), and triple plus (2). Abnormal hairiness of the body was observed in only one

man, and the general impression was that the Jebeliyeh had slightly less hair than their neighbors the Beduins of Sinai. The following figures were recorded: absent (10), slight (3), average (3), and double plus (1). Their natural modesty and shyness prevented the Jebeliyeh from opening willingly their clothes so that the chest could be examined. They showed their distastefulness clearly, so that I abandoned this examination after seventeen subjects.

Head grayness was recorded as absent (37), some (21), plus (9), and double plus (5). Beard grayness was very similar: absent (37), some (20), plus (11), and double plus (4).

Eyes. -- The eyes were dark brown, with only one green-brown exception. The iris was clear.

EYES

<u>Color</u>	<u>No.</u>	<u>Per cent</u>
Black.....	0	.....
Dark brown.....	69	98.57
Green-brown.....	1	1.43
Total.....	70	100.00

<u>Iris</u>	<u>No.</u>	<u>Per cent</u>
Clear.....	61	88.40
Rayed.....	0	.....
Zoned.....	3	4.35
Spotted.....	5	7.25
Total.....	69	100.00

No. 115 had blue-ringed sclera. No. 140 had half vision. No. 131 was blind. No. 138 was blind in the left eye. The right eye was almost blind in No. 133. No. 189 had the right eye partly closed but insisted vision was still good. No. 144 had half vision with the right eye.

The eyes -- or more properly the eye slits -- were horizontal, as in Europeans. In general, the eyes were clear and the vision good, but far less keen than the local Beduins.

Eyebrow Concurrence. -- This was recorded as: absent (13), small (26), average (30), and double plus (0).

Browridges. -- The majority (64) were average, with four small and one in the absent category.

Nose. -- The nasal profile was convex, with less than one-third in the straight and concave categories. The alae were medium to compressed. The nasal tip was small (20), average (45), double plus (4), and triple plus (2).

NOSE

<u>Profile</u>	<u>No.</u>	<u>Per cent</u>
Wavy.....	2	2.78
Concave.....	13	18.06
Straight.....	15	20.83
Convex.....	<u>42</u>	<u>58.33</u>
Total.....	72	100.00

<u>Wings</u>	<u>No.</u>	<u>Per cent</u>
Compressed.....	15	21.13
Medium.....	48	67.61
Flaring.....	<u>8</u>	<u>11.27</u>
Total.....	71	100.01

Mouth. -- The majority of the lips were similar to those of the average European, but there was considerable eversion of the lower lip. The integumental thickness of the upper lip was recorded as average (56), there being no Jebeliye in the other categories. The lower lip was recorded as double plus (36) or even triple plus (18).

Teeth. -- The occlusion was recorded as normal slight overbite in 84.38 per cent. One-third of the Jebeliye had considerable wear, probably the result of the milled grain and sugar supplied free by the Monastery. Eruption was complete (36) or partial (15). Crowding was absent (60), plus (3), and double plus (0).

TEETH

<u>Bite</u>	<u>No.</u>	<u>Per cent</u>
Under.....	0	.....
Edge-to-edge.....	1	1.56
Slight over.....	54	84.38
Marked over.....	<u>9</u>	<u>14.06</u>
Total.....	64	100.00

TEETH

<u>Wear</u>	<u>No.</u>	<u>Per cent</u>
Absent, some.....	27	38.57
Plus.....	19	27.14
Double or triple plus.....	24	34.29

Total.....	70	100.00
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<u>Loss</u>	<u>No.</u>	<u>Per cent</u>
None.....	16	22.86
Few.....	23	32.86
Some.....	12	17.14
Plus.....	10	14.29
Double plus.....	9	12.86

Total.....	70	100.01
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The dental condition was good, with Nos. 123, 125, and 159 recorded as excellent. No. 119 (age 30) had worn teeth and four missing, which he attributed to the fact that he had worked in Suez -- that is, with access to sugar and canned food. Many teeth had been lost by No. 128 (age 45), No. 114 (age 50), and No. 145 (age 70). All teeth had been lost by Nos. 132 (age 50) and 140 (age 70).

Ears. -- The lobe was soldered (10), attached (50), and free (1). In size, the left ear was very small (0), small (12), average (51), and double plus (8). The protrusion was recorded as: small (5), average (54), and double plus (11).

Musculature and Health. -- The Jebeliyeh had well-developed musculature, and those examined were in good health.

Disease. -- No. 102 had favus.

Tattooing. -- No. 116 had a comb (misht) on the right wrist and two crossed fish on the back of the right hand, which had been done during a visit to Cairo.

Branding. -- None observed.

Scar. -- No. 139 had a scar over glabella. No. 124 had a round scar, probably from an abscess, on the left edge of the mouth.

Negroid. -- Nos. 88, 89, and 135.

Summary. -- The average Jebeli had low-wavy hair, dark brown in color and medium to fine in texture. The eyes were dark brown with clear irides. The nose was convex with medium alae. The teeth, musculature, and health were good.

STATISTICAL ANALYSES OF JEBELIYEH

Half the Jebeliyeh were medium (160.0-169.9) in stature, the remainder tending to be tall. The mean was 167.01 (range 149.0-183.0), a figure slightly above the mean for Southwestern Asia.

STATURE

Harvard System	No.	Per cent
Short (x-160.5).....	5	11.90
Medium (160.6-169.4).....	20	47.62
Tall (169.5-x).....	<u>17</u>	<u>40.48</u>
Total.....	42	100.00

Keith System	No.	Per cent
Short (x-159.9).....	4	9.52
Medium (160.0-169.9).....	21	50.00
Tall (170.0-179.9).....	15	35.71
Very tall (180.0-x).....	<u>2</u>	<u>4.76</u>
Total.....	42	99.99

Minimum Frontal Diameter. -- The head was wide (110-119) or narrow (100-109), but five men had very wide (120-x) heads. The mean was 113.50 (range 107-128).

MINIMUM FRONTAL DIAMETER

Group	No.	Per cent
Very narrow (x-99).....	0	.....
Narrow (100-109).....	13	17.81
Wide (110-119).....	55	75.34
Very wide (120-x).....	<u>5</u>	<u>6.85</u>
Total.....	73	100.00

Head Breadth. -- The head was narrow or wide, with a mean of 138.64 (range 125-158).

HEAD BREADTH

Group	No.	Per cent
Very narrow (120-129).....	6	8.22
Narrow (130-139).....	33	45.21
Wide (140-149).....	32	43.84
Very wide (150-x).....	<u>2</u>	<u>2.74</u>
Total.....	73	100.01

Cephalic Index. -- The majority were dolichocephalic, there being 24.66 per cent in the ultradolichocephalic (x-70.0) category. The mean head length was 192.15 (range 173-221), which, combined with the relatively narrow breadth of 138.64 (range 125-158), gave a cephalic index of 72.24, a figure I believe to be close to that of the Proto-Mediterranean mean.

CEPHALIC INDEX

Harvard System	No.	Per cent
Dolichocephalic (x-76.5).....	68	93.15
Mesocephalic (76.6-82.5).....	5	6.85
Brachycephalic (82.6-x).....	<u>0</u>	<u>.....</u>
Total.....	73	100.00

Keith System	No.	Per cent
Ultradolichocephalic (x-70.0).....	18	24.66
Dolichocephalic (70.1-75.0).....	49	67.12
Mesocephalic (75.1-79.9).....	5	6.85
Brachycephalic (80.0-84.9).....	1	1.37
Ultrabrachycephalic (85.0-x).....	<u>0</u>	<u>.....</u>
Total.....	73	100.00

Facial Measurements and Indices. -- The upper part of the face showed considerable variation, more than half the group being long-faced (70-x). The mean was 69.65 (range 54-80).

The total facial length also tended to be long (120-x). The mean was 121.40 (range 103-137).

A grouping of the total facial indices places 64.38 per cent in the leptoprosopic category, with only six Jebeliye recorded as euryprosopic. The upper facial

index was 52.10 (range 42-62), and the total facial index was 91.95 (range 72-105).

FACIAL MEASUREMENTS

Upper Facial Height	No.	Per cent
Short (x-63).....	8	10.96
Medium short (64-69).....	26	35.62
Medium long (70-75).....	31	42.47
Long (76-x).....	8	10.96
Total.....	73	100.01

Total Facial Height	No.	Per cent
Short (x-109).....	5	6.85
Medium short (110-119).....	25	34.25
Medium long (120-129).....	30	41.10
Long (130-x).....	13	17.81
Total.....	73	100.01

TOTAL FACIAL INDEX

Group	No.	Per cent
Euryprosopic (x-84.5).....	6	8.22
Mesoprosopic (84.6-89.4).....	20	27.40
Leptoprosopic (89.5-x).....	47	64.38
Total.....	73	100.00

Nasal Measurements and Indices. -- The average Jebeli possessed a nose medium in length with medium narrow or medium wide alae and a leptorrhine index. The mean height was 54.34 (range 46-63), the breadth 35.87 (range 29-46), and the nasal index 66.70 (range 51-81).

NASAL MEASUREMENTS

Nasal Height	No.	Per cent
Short (x-49).....	9	12.33
Medium (50-59).....	57	78.08
Long (60-x).....	7	9.59
Total.....	73	100.00

NASAL MEASUREMENTS

<u>Nasal Breadth</u>	<u>No.</u>	<u>Per cent</u>
Very narrow (x-29).....	1	1.37
Medium narrow (30-35).....	37	50.68
Medium wide (36-41).....	30	41.10
Wide (42-x).....	<u>5</u>	<u>6.85</u>
Total.....	73	100.00

NASAL INDEX

<u>Group</u>	<u>No.</u>	<u>Per cent</u>
Leptorrhine (x-67.4).....	45	61.64
Mesorrhine (67.5-83.4).....	28	38.36
Platyrrhine (83.5-x).....	<u>0</u>	<u>.....</u>
Total.....	73	100.00

In order to furnish additional statistical data for comparison with my published figures on Iran and Iraq, the following tables have been calculated:

JERELIYEH OF ST. CATHERINE'S MONASTERY

Minimum Frontal Diameter

Head Breadth	x-99 No. %	100-109 No. %	110-119 No. %	120-x No. %	Totals No. %
120-129.....	0 0	4 5.48	2 2.74	0 0	6 8.22
130-139.....	0 0	7 9.59	26 35.62	0 0	33 45.21
140-149.....	0 0	2 2.74	27 36.99	3 4.11	32 43.84
150-x.....	0 0	0 0	0 0	2 2.74	2 2.74
Totals.....					73 100.01

Biszygonatic Breadth

Total Facial Length	x-124 No. %	125-134 No. %	135-x No. %	Totals No. %
x-114.....	3 4.11	9 12.33	2 2.74	14 19.18
115-124.....	0 0	20 27.40	14 19.18	34 46.58
125-x.....	2 2.74	9 12.33	14 19.18	25 34.22
Totals.....				73 100.01

Upper Facial Length

Total Facial Length	x-63 No. %	64-69 No. %	70-75 No. %	76-81 No. %	82-x No. %	Totals No. %
x-109.....	3 4.11	2 2.74	0 0	0 0	0 0	5 6.85
110-119.....	4 5.48	16 21.92	5 6.85	0 0	0 0	25 34.25
120-129.....	1 1.37	8 10.96	17 23.29	4 5.48	0 0	30 41.10
130-x.....	0 0	0 0	9 12.33	4 5.48	0 0	13 17.81
Totals.....						73 100.01

Nasal Width

Nasal Length	x-29 No. %	30-35 No. %	36-41 No. %	42-x No. %	Totals No. %
x-49.....	0 0	6 8.22	3 4.11	0 0	9 12.33
50-59.....	1 1.37	29 39.73	24 32.88	3 4.11	57 78.06
60-x.....	0 0	2 2.74	3 4.11	2 2.74	7 9.59
Totals.....					73 100.00

MEASUREMENTS AND INDICES OF JERELIYEH OF ST. CATHERINE'S MONASTERY

Measurement	No.	Range	Mean	S. D.	C. V.
Age.....	73	18-70	38.85 ± 1.24	15.70 ± .88	40.41 ± 2.95
Stature.....	42	149-183	167.01 ± .70	6.81 ± .50	4.08 ± .30
Head length.....	73	173-221	192.15 ± .56	7.11 ± .40	3.70 ± .21
Head breadth.....	73	125-158	138.64 ± .49	6.18 ± .34	4.46 ± .25
Minimum frontal diameter....	73	107-128	113.50 ± .34	4.40 ± .24	3.88 ± .22
Biszygonatic diameter.....	73	123-144	133.25 ± .41	5.25 ± .29	3.94 ± .22
Bigonial diameter.....	73	95-123	109.42 ± .45	5.64 ± .32	5.15 ± .29
Total facial height.....	73	103-137	121.40 ± .62	7.85 ± .44	6.47 ± .36
Upper facial height.....	73	54-80	69.65 ± .43	5.50 ± .31	7.90 ± .44
Nose height.....	73	46-63	54.34 ± .33	4.16 ± .23	7.66 ± .42
Nose breadth.....	73	29-46	35.87 ± .24	3.06 ± .17	8.53 ± .48
Ear length.....	72	45-69	56.35 ± .40	5.05 ± .28	8.96 ± .51
Ear breadth.....	72	27-40	33.59 ± .21	2.61 ± .15	7.77 ± .44
Indices					
Cephalic.....	73	65-82	72.24 ± .25	3.12 ± .18	4.32 ± .24
Fronto-parietal.....	73	77-90	82.21 ± .24	3.06 ± .17	3.72 ± .21
Zygo-frontal.....	73	79-92	85.66 ± .23	2.92 ± .16	3.41 ± .19
Zygo-gonial.....	73	72-90	82.45 ± .24	3.06 ± .17	3.71 ± .21
Total facial.....	73	72-105	91.95 ± .45	5.65 ± .32	6.14 ± .34
Upper facial.....	73	42-62	52.10 ± .28	3.48 ± .20	6.68 ± .37
Nasal.....	73	51-81	66.70 ± .48	6.08 ± .34	9.12 ± .51
Ear.....	72	45-76	59.80 ± .47	5.95 ± .34	9.95 ± .56
Cephalo-facial.....	73	89-108	96.20 ± .30	3.87 ± .22	4.02 ± .22
Fronto-gonial.....	73	85-105	96.90 ± .34	4.40 ± .24	4.54 ± .26

COMPARATIVE DATA

In order to compare our three groups measured in Sinai, the following table of measurements and indices has been compiled:⁵⁸

Measurements	No.	Beduins	No.	Jebel- Iyeh	No.	Towara ⁵⁹
Age.....	148	40.60	73	38.85	..	.....
Stature.....	67	165.72	42	167.01	63	165.80
Head breadth.....	150	139.72	73	138.64	63	139.18
Head length.....	150	193.74	73	192.15	63	191.30
Minimum frontal diameter.....	150	113.78	73	113.50	63	106.85
Bizygomatic diameter.....	150	132.80	73	133.25	63	129.20
Bigonial diameter	150	109.14	73	109.42	63	97.40
Total facial height.....	150	120.25	73	121.40	63	117.40
Upper facial height.....	150	70.95	73	69.65	63	60.56
Nasal height.....	150	54.86	73	54.34	63	50.18
Nasal breadth....	150	36.65	73	35.87	63	39.11
Ear length.....	142	58.85	72	56.35	..	.....
Ear breadth.....	142	35.33	72	33.59	..	.....
<u>Indices</u>						
Cephalic.....	150	72.35	73	72.24	63	72.95
Fronto-parietal..	150	81.22	73	82.21	..	.....
Zygo-frontal.....	150	85.58	73	85.66	..	.....
Zygo-gonial.....	150	82.06	73	82.45	..	.....
Total facial.....	150	91.05	73	91.95	63	91.52
Upper facial.....	150	53.30	73	52.10	..	.....
Nasal.....	150	66.86	73	66.70	63	78.20
Ear.....	142	60.50	72	59.80	..	.....
Cephalo-facial...	150	95.06	73	96.20	..	.....
Fronto-gonial....	150	96.05	73	96.90	..	.....

PROPOSED FUTURE WORK IN SINAI

Although the preceding anthropometric data indicate that they are close to the mean of a very large series of measurements and observations on the modern dwellers in Sinai, minor trends might well appear if a large series

were obtained. Samples should be taken along the eastern border from El Arish-Kuntilla-Themed and along the southern shore from Aqaba-Nuwaiba-Ras Mohammed-Tor. It would, however, be advisable to take special care with the seaport samples, which are probably extremely mixed.

The main difficulty in Sinai is that the Beduins naturally prefer those wadis inaccessible to, or at least unfrequented by, the few wheeled vehicles that generally follow: the main road from Ismailia to Rafa; the north-south road from Ismailia-Suez-Abu Zeneimeh-Tor; and the track from Abu Zeneimeh-Feiran-St. Catherine's Monastery. Consequently the Beduins are few and far between. However, we were informed that at certain seasons Beduins visit El Arish, Magdhaba, Bir Hasaneh, Nekhl, Ayun Musa, Feiran Oasis, and Tor.

In the years to come we must hope that additional measurements on the Harvard-Oxford system will be available, so that the racial position of the Beduins of Sinai may be determined in relation to the peoples of the Nile Valley to the west and Palestine, Jordan, and Saudi Arabia to the east and southeast.

On the basis of the anthropometric data now available, the modern dwellers on the land bridge between Asia and Africa appear to be close physically to the ancient Proto-Mediterranean of Southwestern Asia and to the modern basic Mediterranean type of this area.

We may well be dealing with an "island" of population relatively pure and only slightly intermingled with extraneous racial elements.

APPENDIX A

TOWARA OF SINAI

by

G. W. MURRAY

The following anthropometric data, which were scheduled to appear in "Sons of Ishmael," (London, 1935), were obtained during 1934. The instruments were kindly lent by the Royal Anthropological Institute, London.

Nos. 1-18 were Muzeina; Nos. 19-34 Wilad Said; Nos. 35-47 Aleiqat; Nos. 48-52 Hamada; Nos. 53-60 Qararsha; No. 61 Awarma; No. 62 Tabana; and No. 63 Haweitat (Huwaitat).

TOWARA OF SINAI

No.	Stature	Circ.	L	B	B'	J	Go-go
1	1590	569	199	143	103	115	97
2	1582	569	198	145	108	125	96
3	1570	569	194	144	104	125	94
4	1640	564	199	136	109	128	98
5	1633	551	189	127	103	127	97
6	1593	554	190	138	110	130	91
7	1806	572	199	140	107	140	101
8	1713	548	185	140	103	135	99
9	1620	556	195	141	104	131	100
10	1611	574	200	143	110	127	94
11	1720	569	188	145	110	135	97
12	1603	548	187	129	101	124	85
13	1675	542	194	140	101	125	106
14	1690	548	191	144	106	131	104
15	1645	535	184	139	105	124	95
16	1675	562	199	139	110	127	100
17	1665	548	195	130	107	126	100
18	1714	537	185	139	111	127	95
19	1680	551	188	139	106	130	100
20	1683	546	183	132	110	125	99
21	1732	531	190	129	106	134	101
22	1787	561	195	140	101	130	100
23	1685	546	187	138	107	129	98
24	1616	555	196	139	106	125	88
25	1613	542	182	145	104	128	99

No.	Stature	Circ.	TOWARA OF SINAI				Go-go
			L	B	B'	J	
26	1779	575	190	144	108	129	100
27	1674	537	186	137	100	117	85
28	1635	550	189	139	107	128	97
29	1631	550	193	140	100	128	95
30	1690	525	184	131	103	119	90
31	1705	555	190	131	100	125	92
32	1652	526	186	137	105	131	95
33	1733	550	184	144	105	133	100
34	1739	550	191	141	105	127	95
35	1699	540	191	130	100	118	94
36	1638	537	188	138	100	120	95
37	1668	551	190	148	111	122	94
38	1682	555	193	145	107	134	80
39	1680	532	191	136	103	128	90
40	1770	530	185	139	113	134	104
41	1592	561	197	141	101	125	95
42	1630	556	191	138	104	130	100
43	1638	577	195	142	108	133	93
44	1679	584	184	150	116	158	91
45	1723	569	197	140	115	135	101
46	1622	543	189	139	119	135	97
47	1647	561	195	138	109	136	100
48	1637	561	201	131	108	127	101
49	1575	543	190	138	110	130	96
50	1685	579	203	148	113	128	108
51	1680	564	198	137	109	127	97
52	1701	584	199	148	120	147	101
53	1626	566	195	141	103	127	90
54	1646	569	197	136	105	127	95
55	1626	569	194	138	107	131	108
56	1591	564	193	143	109	130	106
57	1585	556	193	140	113	128	99
58	1666	546	190	141	107	131	99
59	1627	538	173	141	105	124	98
60	1566	556	190	138	110	129	98
61	1677	531	185	141	107	135	95
62	1715	534	177	137	103	116	100
63	1646	555	197	144	105	136	95

120 SINAI

No.	TOWARA OF SINAI						
	GH	G'H	NH	NB	B/L	GH/J	NB/NH
1	125	58	48	42	71.86	108.70	87.50
2	116	64	57	40	73.28	92.80	70.18
3	120	59	51	42	74.23	96.00	82.35
4	114	66	52	40	68.34	89.06	76.92
5	131	69	50	39	72.49	103.14	78.00
6	113	59	57	37	72.63	86.92	64.91
7	140	77	66	50	70.35	100.00	75.76
8	128	70	64	50	75.68	94.81	78.12
9	108	56	50	44	72.31	81.96	88.00
10	116	59	50	41	71.50	91.34	82.00
11	118	60	58	38	77.13	87.41	65.52
12	114	61	48	39	68.98	91.69	81.25
13	120	62	48	36	72.16	96.00	75.00
14	124	61	50	38	75.39	94.66	76.00
15	107	58	49	37	75.54	86.29	75.51
16	122	60	50	37	69.85	96.06	74.00
17	119	55	54	43	66.66	94.44	79.63
18	112	55	47	35	75.13	88.19	74.47
19	121	64	55	38	73.94	93.08	69.09
20	122	65	53	39	72.13	97.60	73.58
21	122	64	59	43	67.89	91.04	72.88
22	120	60	53	42	71.80	92.31	79.25
23	122	62	46	36	73.80	94.57	78.26
24	113	51	45	37	70.92	90.40	82.22
25	107	53	51	38	79.67	83.59	74.51
26	114	54	48	39	75.79	88.37	81.25
27	118	61	48	34	73.65	100.85	70.84
28	105	52	45	35	73.54	83.06	77.78
29	111	54	40	38	72.54	86.72	95.00
30	112	58	45	37	71.20	94.12	82.22
31	109	56	45	38	68.94	91.31	84.44
32	114	56	47	38	73.66	86.48	80.85
33	122	57	50	34	73.26	91.73	68.00
34	112	58	48	37	73.82	88.19	77.09
35	99	47	38	38	68.06	83.90	100.00
36	115	54	47	30	73.41	95.83	63.82
37	125	64	51	37	77.89	102.46	72.55
38	124	64	51	37	75.13	92.54	72.55
39	117	57	49	36	71.25	91.41	73.47
40	122	68	55	33	75.13	91.04	60.00
41	122	62	49	42	71.57	97.60	85.71
42	125	65	53	39	72.25	96.15	73.58
43	108	56	51	41	72.82	81.20	80.39
44	121	59	46	39	81.52	87.68	84.78

TOWARA OF SINAI

No.	GH	G'H	NH	NB	B/L	GH/J	NB/NH
45	116	64	54	41	71.07	85.93	75.92
46	109	58	48	38	73.54	80.74	79.17
47	119	67	56	43	70.77	87.50	76.78
48	125	62	50	38	65.17	98.42	76.00
49	110	60	51	44	72.63	84.62	86.27
50	115	59	45	44	72.91	89.84	97.78
51	115	65	47	38	69.19	90.55	80.85
52	124	69	54	45	74.37	84.35	83.33
53	116	63	47	41	72.31	91.34	87.23
54	121	65	52	40	69.03	95.27	76.92
55	120	63	52	38	71.13	91.60	73.08
56	116	57	51	40	74.09	89.23	78.43
57	114	58	48	40	72.54	89.06	83.33
58	115	60	46	36	74.21	87.79	78.26
59	109	52	40	40	81.50	87.91	100.00
60	123	68	60	42	72.63	95.35	70.00
61	129	70	59	39	76.22	95.71	66.10
62	112	55	44	39	77.40	96.55	88.64
63	119	64	53	36	73.09	87.50	67.92

MEASUREMENTS AND INDICES OF TOWARA BEDUINS OF SINAI⁶⁵

Measurements	No.	Range	Mean	S. D.	C. V.
Stature.....	63	156-181	165.80 ± .48	5.60 ± .34	3.38 ± .20
Circumference.....	63	525-584	553.55 ± 1.19	13.98 ± .84	2.53 ± .16
Head length.....	63	173-203	191.30 ± .51	5.95 ± .36	3.11 ± .19
Head breadth.....	63	127-150	139.18 ± .41	4.84 ± .29	3.48 ± .21
Minimum frontal diameter....	63	100-120	106.85 ± .36	4.29 ± .26	4.01 ± .24
Bisygomatic breadth.....	63	115-158	129.20 ± .58	6.80 ± .41	5.26 ± .32
Bigonial breadth.....	63	80-108	97.40 ± .43	5.05 ± .30	5.18 ± .31
Total facial height.....	63	99-140	117.40 ± .63	7.35 ± .44	6.26 ± .38
Upper facial height.....	63	47-77	60.56 ± .47	5.49 ± .33	9.07 ± .55
Nasal height.....	63	38-66	50.18 ± .44	5.19 ± .31	10.34 ± .62
Nasal breadth.....	63	30-50	39.11 ± .30	3.51 ± .21	8.97 ± .54
<u>Indices</u>					
Cephalic.....	63	65.17-81.52	72.95 ± .28	3.36 ± .20	4.61 ± .28
Total facial.....	63	80.74-108.70	91.52 ± .49	5.75 ± .34	6.28 ± .38
Nasal.....	63	60.00-100.00	78.20 ± .70	8.25 ± .49	10.55 ± .63

APPENDIX B

SKELETAL MATERIAL FROM WADI SOLAF

On January 7, 1948, nineteen skulls and calvaria were measured, described, and photographed. One of the beehive tombs (nawamis,⁶¹ singular: namus) on the left bank of the upper part of the Wadi Solaf was opened by removing the circular capstone. The location of these nawamis, which is marked as a historical monument on the 1:1,000,000 Feiran sheet, is given as 33°45' E and 28°38' N.

The following notes were observed on each cranium. The recorders in Sinai were Gladys Terry (13) and Wendell Phillips (6). The anthropometric forms were obtained from the Peabody Museum, Harvard.

No. 1. -- Calvarium, condition good; sex uncertain, probably male; muscularity medium; middle-aged (36-55); weight medium; deformation none; atlas fused; skin partly covers scalp; right ear perfect; several (1-4) teeth lost ante mortem; teeth wear pronounced.

No. 2. -- Calvarium, condition good; sex uncertain, probably female; muscularity small; middle-aged (36-55); deformation none; no teeth lost ante mortem; teeth wear slight.

No. 3. -- Calvarium, condition good; sex male; middle-aged (36-55); deformation none; Wormian bone above inion; teeth wear medium.

No. 4. -- Calvarium, condition good; sex male; muscularity medium; young adult (21-35); Wormian bone at inion; one tooth lost ante mortem.

No. 5. -- Calvarium, condition fair; sex male; muscularity medium; young adult (21-35); small massing at glabella; spring of nasal arch high; no teeth lost ante mortem; teeth wear slight; teeth quality good; shovel incisors pronounced.

No. 6. -- Cranium, condition good; sex male; muscularity large; old adult (56-75); all teeth missing; jaw atrophied, with maximum thickness of 19.0; massing of bone at glabella and marked supra-orbital crest; skin still adhering to parietals.

No. 7. -- Calvarium, condition good; sex uncertain, probably male; muscularity small; young adult (21-35); small parietal bosses; four teeth lost ante mortem; teeth wear pronounced; caries none; shovel incisors pronounced.

No. 8. -- Calvarium, condition good; sex male, muscularity large; middle-aged (36-55); Wormian bone at inion above massing of bone in this area; skin and patches of dark brown hair adhered to parietals; complete absorption of the gums; about fifteen teeth lost ante mortem.

No. 9. -- Calvarium, condition good; sex uncertain, probably male; muscularity small; old adult (56-75); all teeth lost ante mortem; complete absorption of the palate.

No. 10. -- Calvarium, condition good; sex male; muscularity large; middle-aged adult (36-55); massing of bone at glabella; spring of nasal arch high; third right lower molar erupting; first lower molars large; few (1-4) teeth lost ante mortem; teeth wear medium; caries none.

No. 11. -- Calvarium, condition good; sex uncertain, probably male; muscularity small; young adult (21-35); complete absorption of right side of palate, which is U-shaped; several (5-8) teeth lost ante mortem; teeth wear medium; shovel incisors pronounced.

No. 12. -- Calvarium, condition good; sex uncertain; muscularity small; child (7-12); persistent metopic suture; spring of nasal arch high; second molars erupting.

No. 13. -- Cranium, condition good; sex male; muscularity medium; middle-aged adult (36-55); dark brown hair and skin adhering to right parietal; spring of nasal arch high; some absorption of the gums; sixteen teeth lost ante mortem; teeth wear pronounced; large abscess on lower right third molar; tooth formula: right 2111000
and left 2110000. 2110000
2110001

No. 14. -- Cranium, condition good; sex male; muscularity large; middle-aged adult (36-55); four teeth missing in upper jaw; tooth formula of lower jaw, left 2100000 and right 0110000.

No. 15. -- Calvarium, condition good; sex uncertain, probably female; muscularity small; young adult (21-35); deformation none; orbital margins sharp; spring of nasal arch high; some (1-4) teeth lost ante mortem; teeth wear slight; left third lower molar impacted.

No. 16. -- Calvarium, condition good; sex uncertain, probably male; muscularity medium; subadult (18-20); spring of nasal arch high; some (1-4) teeth lost ante mortem; third molars erupting; teeth wear none; caries none.

No. 17. -- Calvarium, condition good; sex male; muscularity medium; young adult (21-35); six teeth lost ante mortem; teeth wear pronounced; caries none.

No. 18. -- Calvarium, condition good; sex uncertain, probably male; muscularity small; adolescent (13-17).

No. 19. -- Calvarium, condition good; sex uncertain, probably male; muscularity small; adolescent (13-17); deformation none; two teeth lost ante mortem; third molars erupting.

The statistical tables, including the indices, were calculated by Mrs. Theodore L. Stoddard in the Statistical Laboratory of the Peabody Museum at Harvard.

MEASUREMENTS AND INDICES OF CRANIA IN WADI SOLAF

No.	GOL	GB	CI	B-BH	MFD	Bi2. B	NPH
1	192	128	66.7	...	107	137	65
2	188	130	69.1	132	95	123	67
3	184	124	67.3	...	97	127	..
4	171	127	74.2	134	90	120	62
5	181	122	67.4	136	88	120	60
6	185	128	69.1	...	103	124	..
7	178	122	68.5	125	90	116	59
8	184	130	70.6	130	96	125	59
9	178	124	69.6	132	92	116	..
10	183	129	70.4	136	93	124	..
11	180	120	66.7	131	90	118	65
12	164	118	71.9	116	82	105	58
13	170	132	77.6	...	97	126	59
14	182	125	68.6	126	93	119	..
15	168	119	70.8	123	87	113	..
16	167	122	73.0	120	89	113	..
17	173	120	69.3	120	90	123	63
18	161	113	70.1	121	80	94	..
19	162	116	71.6	115	80	99	49

MEASUREMENTS AND INDICES OF CRANIA IN WADI SOLAF

No.	NH	NB	NI	LOH	LOB	LOI
1	44	41	93.1	29	41	70.7
2	48	25	52.0	29	35	82.8
3	56	27	48.2	29	34	85.2
4	47	24	51.0	25	37	67.5
5	48	22	45.8	25	32	78.1
6	58	28	48.2	23	35	65.7
7	49	24	48.9	26	32	81.2
8	47	24	51.0	29	38	76.3
9	48	23	47.9	23	37	62.1
10	51	26	50.9	30	38	78.9
11	33	35	44.2	33	35	94.2
12	46	23	50.2	27	29	93.1
13	52	27	51.9	27	38	71.0
14	55	24	43.6	27	33	81.8
15	50(?)	22	44.0(?)	25	32	78.1
16	47	22	46.8	23	29	79.3
17	49	23	46.9	25	32	78.1
18	..	..	....	..	..	....
19	41	21	51.2	21	30	70.0

MEASUREMENTS AND INDICES OF CRANIA IN WADI SOLAF

No.	ROH	ROB	F-PI	CM	UFI	C-FI	Z-FI
1	29	40	83.5	.....	47.4	107.0	78.1
2	29	36	73.0	150.0	54.4	94.6	77.2
3	29	34	78.2	.....	....	102.4	76.3
4	24	34	70.8	144.0	51.6	94.4	75.0
5	25	33	72.1	146.3	50.0	98.3	73.3
6	25	35	80.4	.....	....	96.8	83.0
7	26	34	73.7	141.6	50.8	95.0	81.2
8	29	36	73.8	148.0	47.2	96.1	76.8
9	19	34	74.1	144.6	....	93.5	79.3
10	28	35	72.0	149.3	....	96.1	50.9
11	31	32	75.0	143.6	55.0	98.3	76.2
12	29	36	69.4	132.6	55.2	88.9	78.0
13	23	37	73.4	.....	46.8	95.4	76.9
14	27	32	74.4	144.3	....	95.2	78.1
15	22	32	73.1	136.6	....	94.9	76.9
16	26	29	72.9	136.3	....	92.6	78.7
17	29	39(?)	75.0	137.6	51.2	102.5	73.1
18	..	..	70.7	131.6	....	83.1	85.1
19	21	30	68.9	131.0	49.4	85.3	80.8

Notes. -- The measurements of the right ear of No. 1 were EH = 40 and EB = 23 with EI = 58.0. No. 12 was a child; Nos. 18 and 19 were adolescents.

Since the series of sixteen adults (18-x) contains several females and some whose sex could not be determined, no valid statistical means were possible. However, the general trends are clear. For example, the cephalic indices reveal a dolichocephalic group.

My general impression is that these crania from this nawamis in the Wadi Solaf belonged to the direct ancestors of the modern Towara Beduins of southern Sinai.

We must hope that anthropometric data will be recorded from additional crania stored in these circular beehive tombs, which are scattered throughout this mountain complex.

BEDUINS STUDIED NEAR SUEZ

On February 18, 1948, Mr. and Mrs. Jacques Daumas drove me from Cairo to Port Tewfiq near Suez. With the generous assistance of Mr. Daumas and Mr. Jean-Edouard Goby⁶² of the Société d'Etudes Historiques et Géographiques de l'Isthme de Suez, preliminary arrangements were made for anthropometric work on Beduins from Sinai now living in or near Suez.

Through the personal interest of Mr. Raymond Escourrou, chief engineer of Section 3 of the Canal Company, in scientific research in this area Mr. Raymond Paul Ghanem was requested to act as guide and interpreter and a Canal Company car and driver were assigned to us for February 19.

Our first call in the Suq was on Sheikh Eid Ahmed Musallim, who agreed at once to accompany us to the Wadi el-Ghal between Suez and Jebel Attaqa, where some Beduins lived in mud huts on the plain. Here we were met by tall and handsome Sheikh Musa Hussein Salem of the Wilad Said, who invited us into his guest chamber. Seated on red hassocks with long white pillows as back rests, we drank tea and asked innumerable tribal questions. The group, consisting of Sheikh Eid, Sheikh Musa, and seven tribesmen, sat in a semicircle before Mr. Ghanem and me. For two hours Mr. Ghanem assisted me with the recording of the following notes, which complement data recorded in Sinai.

According to Sheikh Musa, long before the construction of the Suez Canal, the Haweitat moved westward from the Hejaz passing into Sinai between Aqaba and Jebel Sharr, -- that is, along the Wadi Zoba. Before 1914 only about 5 per cent of the Haweitat were in Egypt west of the Canal, and about 10 per cent in Sinai under Saad Abu Nar. The remainder were under Alayan Abu Tuqaiqa, who was replaced by his nephew, Ahmed Ibrahim. The group in Egypt was at Juhur near Galiubiah under Abdul Kerim Shedid, who was succeeded by his son, Ismail Abdul Kerim Shedid.

After the battle with Ibn Saud in 1932, the Haweitat streamed westward. About five thousand persons reached Egypt; about a hundred and fifty remained in Sinai.

Some six months earlier, a serious dispute over landownership arose between the Haweitat and the Terabin. The area in dispute included parts of the Wadi Mabruq, Wadi Riana, and Wadi Sadr as well as sections near Ayun Musa and El Shatt. According to Sheikh Eid, the Mamur of Qantara divided these lands without consulting him. Furthermore, in Sheikh Eid's opinion, this area belonged to the Qararsha, Sawalha, Wilad Said, Aleiqat, Jebeliyeh, Muzeina, and Beni Wasil. Mr. G. W. Murray was asked his opinion by the topographical survey, but since the matter was still in bitter dispute, the following representatives of the seven tribes concerned went to plead their case before the Governor of Sinai at El Arish.

Tribe	Representatives
Qararsha.....	Eid Ahmed Musallim (Omda) Shirayez Hamdan Zaid Rabia Hassan Simeri
Sawalha.....	Mubarak Hussain Mubarak Arim Hassan
Wilad Said.....	Feteh Saleh Amer Saba Musa Amer
Aleiqat ⁶³	Zeidan Mudakhil Ibrahim Saleh
Jebeliyeh.....	Musa ibn Qarsh
Muzeina.....	Musa ibn Seferan Salim Jebali Breq
Beni Wasil.....	Sulaiman Musa el Mughubbish

Some present tribal strengths were given by Sheikh Eid, while Sheikh Musa (reclining on a pillow with a cold compress on his neck and forehead to stop a nosebleed) grunted comments until a reasonable figure was reached. The following numbers are tents or dwellings. Thus, in order to estimate the number of men, women, and children, multiply by four, but since each Sheikh naturally wishes to appear powerful, these estimates are probably much too generous.

Tribe	Egypt ⁶⁴	Locality	Sinai
Qararsha.....	120	Near Cairo	350
Sawalha.....	600	Near Cairo	200
Wilad Said.....	150		400
Aleiqat.....	200		500
Jebeliyeh.....	5	Suez	150
Muzeina.....	500		800
Beni Wasil.....	800	Beni Suef	50

Sheikh Eid and Sheikh Musa agreed that the tribal marks branded on their camels in Egypt were the same as those used in Sinai. However, in a few cases the subtribes added a bar for identification (see Appendix C).

When questioned, the assembled group of Beduins agreed that the Jebeliyeh were not true Beduins and that they did not come from Arabia. They called them "Rumi" and said they were strangers in their land and servants at St. Catherine's Monastery. One bearded Beduin muttered that no true nomad would deign to marry a member of the Jebeliyeh. Sheikh Eid added parenthetically that his Qararsha are proud descendants of Quraish of the Prophet's clan.

Sheikh Eid commented that the name "Tiha" is derived from the plural of "Tai" ("a man without any landed property" -- that is, a lost people).

There are no Sulubba (Sleyb) in Sinai.

Between three hundred and four hundred Negroes live in Sinai, the majority near Tor. Sheikh Eid commented that forty or more years ago each big sheikh had Negroes as bodyguards and slaves. I have seen the former in the tents of Mohammed Abu Tayi of the Haweit at El Jefer in southwestern Jordan, with the late Ajil al-Yawir, Paramount Sheikh of the Northern Shammar, at Ain Tallawi west of Mosul in Iraq, and with the Southern Shammar at Jumaima in Saudi Arabia.

I measured one almost full-blooded Negro at Nekhl in Central Sinai. Traces of the infiltration of Negro blood were apparent as we walked through the streets of El Arish, near Abu Zeneimeh, and in the Wadi Feiran.

The Sawalha, Wilad Said, and Qararsha should be classified as one tribal group, because their common grandfather was Saleh.

Since Sheikh Eid was so unusually intelligent, a

keen observer, and apparently interested in giving the most accurate information, I asked him to describe any special tribal characteristics. His observations follow:

Aleiqat. -- Fat and short and dark-skinned, only 1 per cent being light. A very few possess blue or bluish-green eyes. For example, one of Zeidan Mudakhil's⁶⁵ sons has blue eyes, but his mother is not an Aleiqati.

Muzeina. -- Thin, hollow cheeks; clothes and body dirty. The majority do not hear well and also do not enunciate clearly for they have a speech impediment. Their eyes are poor. Mainly fishermen.

Sawalha, Wilad Said, and Qararsha. -- Present a certain dignity and maintain true Beduin traditions. Tiaha. -- Nervous temperament.

Terabin. -- Darker-skinned than the Tiaha. Not clean; for example, after smoking a cigarette he will rub his dirty hands on his face. He will scratch in public when the urge arises.⁶⁶

Sheikh Eid and Sheikh Musa agreed that in almost every case they could recognize a Towara from a dweller north of the great escarpment bounding the southernmost rim of the Wilderness of Tih. This recognition would be from appearance and general demeanor. As soon as the man spoke, his general area or tribe would be recognized. In a man's dress there are also means of identification. For example, the Terabin wear a short robe (galibiya). Another mark of identification is that the Muzeina tribesmen shave the head except for a long tuft behind the bregma.

Concerning the nawamis, those curious circular buildings we visited in the Wadi Solaf, Sheikh Eid and Sheikh Musa agreed that the word is derived from "namusa" ("mosquito"). Since there are many mosquitoes in Feiran Oasis, a circular mosquito bar has long been used to prevent malaria. Because these round buildings in the Wadi Solaf and elsewhere in Sinai resembled the mosquito bar, they were called namusa (plural: nawamis).

Both sheikhs believed that the nawamis in the Wadi Solaf are the oldest in Sinai and were used as burial chambers by their ancestors, the Beni Hilal. Following a direct question, they stated emphatically that

the nawamis we visited had not been used for burial since the time of the Beni Hilal.

During the morning I measured eight men after our long interview was concluded. After luncheon Sheikh Eid arranged for me to examine fourteen men in Suez.

BEDUINS OF SUEZ AREA

<u>Tribe</u>	<u>No.</u>
Muzeina.....	6
Sawalha.....	5
Qararsha.....	4
Wilad Said.....	3
Jebeliyeh.....	3
Aleiqat.....	<u>1</u>
Total.....	22

Thus, we can now add this series of twenty-two men to the Beduins of Sinai, although the Jebeliyeh should never be included as true Beduins.

BEDUINS OF SINAI

<u>Tribe</u>	<u>No.</u>
Jebeliyeh.....	73
Qararsha.....	29
Sawalha.....	30
Terabin.....	23
Muzeina.....	23
Tiaha.....	22
Wilad Said.....	11
Aleiqat.....	3
Laheiwat.....	3
Nekhlawis.....	3
Ferayin.....	2
Billi.....	1
Badara.....	1
Heiwat.....	<u>1</u>
Total.....	225

To this series must be added Mr. G. W. Murray's 63 Towara, thus making a grand total of 288 Beduins and Jebeliyeh measured in Sinai.

APPENDIX D

CAMEL BRANDS OF SINAI

The following brands (wasm, plural: wasmat, ausûm or wusûm) were obtained from several informants and were checked and rechecked wherever possible.⁶⁷

Tribe or Subtribe	Wasm	Location
Awarma.....	+	Right side of head
Badara.....	H	Right side of neck
Billi.....	∩	Under right ear
	//	Left side of neck
	|	Right thigh
El Arish ⁶⁸	/0	Right thigh
Hamada.....	///	Left side of neck
Haweitat.....	///	Right side of neck
Jebeliyeh.....	∪	Right eye to ear to mouth
	E	Left side of head
Laheiwat.....	|	Beside right eye
	|	Outer margin ⁶⁹ of right jaw
Muzeina.....	∪	Right side of neck
	∠	Left side of head
Qararsha.....	≡	Right side of chin
	///	Left side of head
Sawalha.....	///	Right side of neck

CAMEL BRANDS OF SINAI

Tribe or Subtribe	Wasm	Location
Suwarka.....	Δ	Right thigh
Tabana.....	/	Left outer leg
Terabin.....	//	Right side of neck
	/	Above left knee
Tiaha.....		Right side of nose
Wilad Said.....	/0	Right side of neck
	C	Left side of head

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- ¹ For description, see Ball, Bar-Droma, Barron, Beadnell, Bonney, Cart, Daumas (1951), Field (1948a and b), Murray, Newcombe, Palmer, Petrie, Ritter, Stanley, Weill, Wilson and Palmer, and Woolley and Lawrence. See also in Bibliography accounts by travelers.
- ² See Awad, Ball, Barron, Barthoux, Beadnell, Cuvillier, Hoppe, Hume, Madgwick, Moon, Murray, Palmer, Petrie, Picard, Ritter, Sadek (1926a and b), Schurmann, Stanley, and Woolley and Lawrence. The majority of these refer to the southern part of the triangle.
- ³ See Albright (1948a) and Field (1948a and b).
- ⁴ River of Egypt of the Bible (Genesis 15: 18 and Numbers 34:5) and the Nahal Muzur of the annals of King Esarhaddon.
- ⁵ See Albright (1948a) and Field (1948a and b).
- ⁶ See Jarvis (1933a), pp. 291-312.
- ⁷ See Abbot, Murray, Range, Ruppell, Spath, and Woolley and Lawrence. The daily weather reports for 1947 are available in the library of the U.S. Weather Bureau. They have not been summarized. The stations include El Arish, Suez, and Tor. Other data appear in "Meteorological Report for 1939," Ministry of Public Works, Cairo, 1947.
- ⁸ Kalaat en-Nakhl was known during the Middle Ages as a puteus Soldani (well of the Sultan).
- ⁹ See Harth, Hume (1922), Jarvis, Murray, Petrie, Post, and Stanley.
- ¹⁰ See Bodenheimer, Harth, Jarvis (1933a), pp. 201-224, Le Roi, Murray, and Petrie.
- ¹¹ See Karl P. Schmidt, "Reptiles of Marshall Field North Arabian Desert Expedition, 1927-1928," Field Museum of Natural History, Zoölogical Series, vol. 17, pp. 223-230, Chicago, 1930, and "Reptiles and Amphibians from Southwestern Asia", FMNH, Zoölogical Series, vol. 24, pp. 49-92, Chicago, 1939.
- ¹² See Albright (1948a), Field (1948a), Jarvis (1931), and Phillips (1948).
- ¹³ See Albright (1948a), Campbell Thompson, Field (1948a), Moritz, Murray, Petrie, and Woolley and Lawrence.
- ¹⁴ See Murray, Palmer, Petrie, Rabino, and Ali Bey Shafai.
- ¹⁵ See Petrie (1906), Eckenstein, and Jarvis.

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- ¹⁶ See Laborde, Palmer, and Petrie.
- ¹⁷ See Eckenstein, Jarvis, Murray, and Petrie. For Proto-Sinaitic inscriptions, see Albright, Bauer, Eiseler, Euting, Fremont, Grimme, Leibovitch, Papamikhalopoulo, Petrie, Sprengling, Stanley, Starr and Butin, and Yeivin.
- ¹⁸ See Field (1948a) for summary.
- ¹⁹ By Ritter, Petrie, Eckenstein, Jarvis (1933a, pp. 16-37, et al.), and Murray.
- ²⁰ In Halliwell, "The voyage and travaille of Sir John Maundeville," vol. 8, p. 63, London, 1839.
- ²¹ Singular: "Tury," according to Robinson. Ritter (vol. 1, p. 386) states that this name is derived from the central mountain chain, not from the harbor of Tor, as Volney and others have suggested.
- ²² My spellings for five main groups are: Sawalha, Aleiqat, Muzeina, Wilad Said, and Beni Wassel.
- ²³ Cf. the Hutemi or Htim, a fishing tribe on the Gulf of Aqaba.
- ²⁴ Schimper refers to the Badara at Jebele, southeast of Tor. He says they are not true Arabs but immigrants from Mount Hor.
- ²⁵ J. Wolff, "Journal account of his missionary labours," letter IV, pp. 310 et seq. London, 1889.
- ²⁶ Cf. J. B. Glubb, "Ignoble Tribes of Arabia" in General Series in Anthropology, No. 10, Menasha, Wisconsin, 1943.
- ²⁷ The Beni et-Tur of Ritter (1866, vol. 1, p. 383) are also known as the Turoniani by Brocardus (thirteenth century), Towara by Burckhardt, and Towarah by Robinson. Eckenstein (1921, p. 188) derives "Towara" from Ar. towa ("mountain").
- ²⁸ R. F. Burton refers to the Salihi or Sawaliheh or Beni Saleh as the principal tribe of the Sinai Beduins.
- ²⁹ Sir Richard Burton, "Pilgrimage . . .," pp. 100 et seq. London, 1879.
- ³⁰ Estimated in 1920 by Eckenstein (p. 188) as 400 or 500 persons.
- ³¹ Quoted from "Cultural Survey of Modern Egypt," Cairo, 1947. For numerical details of tribal groups see Murray, pp. 243-270 and tribal map, p. 247.

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- ³²Regarding the difficulties involved, Murray (p. 263) writes that at a conference of Beduin Sheikhs in Cairo during the 1927 census the Omda of Malki "on being twitted by me that none of his tribe had ever been seen in the desert, replied, 'it is an ancient custom of our tribe to go into the desert whenever there is a census.'"
- ³³The final report is completed and awaiting publication at Harvard.
- ³⁴From February-June, 1950, as leader of the Peabody Museum-Harvard Expedition to the Near East, I found surface stone implements from the Wadi Sirhan to Tell Hibr in Saudi Arabia, in eastern Syria, and northern Iraq (Field, 1951a).
- ³⁵As defined in "The Wilderness of Zin," p. xiv, London, 1915. See Map 1 in Woolley and Lawrence.
- ³⁶F. W. Holland in Palestine Exploration Fund Quarterly Statement, p. 62, 1879.
- ³⁷Hull, "Mount Seir," Appendix, p. 204. The other members of the expedition were not of his opinion, but he adduced good reason on his part (T. E. Lawrence).
- ³⁸Sir Arthur Evans was not deceived (T. E. Lawrence).
- ³⁹In a private communication dated April 26, 1929, T. E. Lawrence wrote me: "... the Beduin today is Eolithic, when lazy; and Paleolithic when he wants a decent flint to trim his toe nails."
- ⁴⁰Cf. Genesis 31: 46 and Joshua 4: 20.
- ⁴¹The use of flint and steel is regular practice among the Beduins of Sinai. I have also seen them used among the Hawaitat of Jordan and the Shammar of northern Iraq and Saudi Arabia.
- ⁴²See Albright (1948a), Field (1948a and b), and Phillips (1948). See also S. A. Huzayyin's forthcoming report on our flint implements, especially the magnificent series of coups-de-poing from Er Rawafi.
- ⁴³In a letter dated November 18, 1948, Dr. Van Riet Lowe, Director, Archaeological Survey, Johannesburg, wrote: "Your discovery of a Lower Palaeolithic station at El-Rawafa in the Wadi el-Arish aroused a host of memories. I was a soldier in that area in 1917 and collected hand-axes in both the Wadi el-Arish and the Wadi el-Ghazze (which runs into the sea just south of Gaza). I was a horse-gunner in those days and could do nothing about it -- one can hardly carry palaeoliths in one's saddle bags when one is at war! Incidentally, it is a boast of mine that I rode on horse-

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back from Cairo to Damascus. Quite a ride! -- only it took me the best part of two years interspersed with not a little excitement and anxiety -- and occasional boredom. And so your latest contribution has set quite a train of thoughts in action. I returned to Palestine in 1937, after the International Conference on Excavations which was held in Cairo that year, but it was a journey of sentiment, not search. Again I passed El Arish and Gaza, but my destination was in Judaea and I had no time to look for my lost axes. Perhaps you have them. I hope so -- for I would like them to be in appreciative hands."

⁴⁸ At El Fallak, Tell Umm Khuraiba, Aqlat el-Sabha, and Ain Qideirat.

⁴⁹ I examined this collection, as yet unpublished, in the Trocadéro Museum, Paris, on November 12, 1947, through the courtesy of Mr. Harper Kelley.

⁵⁰ See Albright(1948a). Stanley (p. 5, n. 1) writes: "The appellation 'Red Sea' as applied distinctively to the two Gulfs of Suez and Akaba is comparatively modern. It seems to have been applied to them only as continuations of the Indian Ocean, to which the name of the Erythraean or Red Sea was given, at a time when the two gulfs were known to the Hebrews only by the name of the 'Sea of Weeds,' and to the Greeks by the name of the Bays of Arabia and Elath. This in itself makes it probable that the name of 'Red' was derived from the corals of the Indian Ocean. . . . The Hebrew word sûph, though used commonly for 'flags' or 'rushes', would by an easy change be applied to any aqueous vegetation (see Dietrich's *Abhandlungen*, pp. 17, 23-25); just as Pliny (xiii, 25) speaks of it as 'a vast forest'; 'Rubrum mare et totus orientis oceanus refertus est sylvis' (Ritter, "Sinai," pp. 466-482)."

⁵¹ Similar confirmation of the recent stability of the Red Sea level was obtained at Ezion-Geber, Solomon's seaport, near Aqaba during 1939-1941 by Dr. Nelson Glueck, then Director, American School of Oriental Research, Jerusalem.

⁵² For a detailed account see Albright(1948a). See also Shafai(1946).

⁵³ See also Ordinance Survey of the Peninsula of Sinai, 1869.

⁵⁴ Peet gives the origin of nawamis as the broken Arabic plural of namusa (mosquito).

⁵⁵ Peet gives the closest analogies to nawamis as being: buildings (sesi) on Pantelleria, usually of truncated form and often contain several tomb chambers; beehive houses (bothan) in the Hebrides, (see *Proceedings of the Society of Antiquaries of Scotland*, vol. 3, pp. 127 et seq). Peet adds that cup markings, usually on fallen blocks, occur in the Wadi Naqb Hawa and Wadi

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Feiran, although we did not see them. According to Peet, a granite block with cup markings was seen on Er Rawafi plain. This is a Beduin landmark. When the Jebeliyeh and Aulad Gindi were servants at St. Catherine's Monastery, they quarreled about land limits; as a result this stone became the boundary, and the head of every family made a cup mark in it. The only cup marks I saw during the expedition were at Mashuru south of Kajiado in Kenya.

⁵² Some difficulty was experienced in recording this name, which seemed to have several variants. Murray (p. 263, n. 1) observes: "A movement has now originated with the Nile Valley Aleiqat to change the name of the tribe to Aqeilat. Aleiqat may indeed have an opprobrious meaning in Arabic, but since Aqeilat has hitherto been reserved for the itinerant camel-traders, always in Egypt Hiteim, they might have selected a better name." For notes on the Hiteim, see "Ignoble Tribes of Arabia" by J. B. Glubb in General Series in Anthropology, No. 10, Menasha, Wisconsin, 1943.

⁵³ See Burckhardt, p. 564.

⁵⁴ H. A. MacMichael, "A History of the Arabs in the Sudan," vol. 2, p. 22, Cambridge, 1922. Quoted from Murray, p. 264.

⁵⁵ Quoted from Murray, p. 264.

⁵⁶ Quoted from Naum Bey Shoucair, p. 354.

⁵⁷ For account, see Robinson, vol. 1, p. 204, quoted by Murray, p. 260.

⁵⁸ See bibliographical references: Field (1948a), pp. 491-493, and especially Ammar, Chantre, Craig, Glubb, Hrdlička, Huzayyin, Mitwally, Myers, and Caton-Thompson.

⁵⁹ Measured by G. W. Murray (see Appendix A).

⁶⁰ These figures were tabulated by Mrs. Theodore L. Stoddard in the Statistical Laboratory of the Peabody Museum at Harvard.

⁶¹ For references, see E. H. Palmer (1871); Petrie (1906); T. E. Peet in *Man*, October, 1915; Murray (1935b), especially plate b, fig. 2, in which is shown the *namus* on the left that we opened; Rabino (1938); Ali Bey Shafai (1946); Albright (1948a, fig. 6); and Field (1948a and 1948b, pp. 486-487).

⁶² Sub-chief engineer of section 3 of the Canal Company and driving force behind this new Society.

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- ⁶³ According to Sheikh Musa Hussein Salim, this tribe should be called Aqeilat ("wearers of the agal," the twisted black camel's hair headband that holds in place the white headcloth).
- ⁶⁴ The Suez Canal is taken as the dividing line. Since Ferdinand de Lesseps opened the Canal in 1869, the banks have been known as the "African" and "Asiatic."
- ⁶⁵ See Murray, pl. 16.
- ⁶⁶ These notes are interpolated, because his manners were too good to put these obvious thoughts into these words.
- ⁶⁷ See Field, "Camel Brands of Southwestern Asia" (MS), and Murray, (1935a), pp. 44-45.
- ⁶⁸ These are tribes in the El Arish area.
- ⁶⁹ One clan uses two parallel bars here.

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No attempt at compiling all references has been made, but rather a working selection to cover a broad anthropogeographic approach to the study of Sinai, the land, its antiquities, and its modern inhabitants. A few pertinent references to adjoining areas have been included.

Special attention is called to the references to Sinai in Bibliographie Géographique de L'Egypte, with 6,158 titles, published under the direction of Henri Lorin by the Royal Geographical Society of Egypt, Cairo, 1928-1929, and to the excellent bibliography on St. Catherine's Monastery in Rabino (1938).

The following abbreviations have been used:

Abbreviations

AA	American Anthropologist
AE	Ancient Egypt, London
AJA	American Journal of Archaeology
AJSL	American Journal of Semitic Languages and Literatures
ASAG	Archives Suisses d'Anthropologie Générale, Geneva
BASOR	Bulletin of the American School of Oriental Research
BRSGI	Bollettino della Reale Società Geografica Italiana
BSRGE	Bulletin de la Société Royale de Géographie d'Egypte
FMNH	Field Museum of Natural History, now Chicago Natural History Museum
GJ	Journal of the Royal Geographical Society
GSQS	Geological Survey General Staff

ABBREVIATIONS

- | | |
|--------|---|
| JPOS | Journal of the Palestine Oriental Society, Jerusalem |
| JRCAS | Journal of the Royal Central Asian Society |
| PEFQS | Palestine Exploration Fund Quarterly Statement |
| RB | Révue Biblique, Paris |
| SEHGIS | Société d'Etudes Historiques et Géographiques de l'Isthme de Suez |
| ZDPV | Zeitschrift der Deutschen Palästina-Vereins, Berlin |
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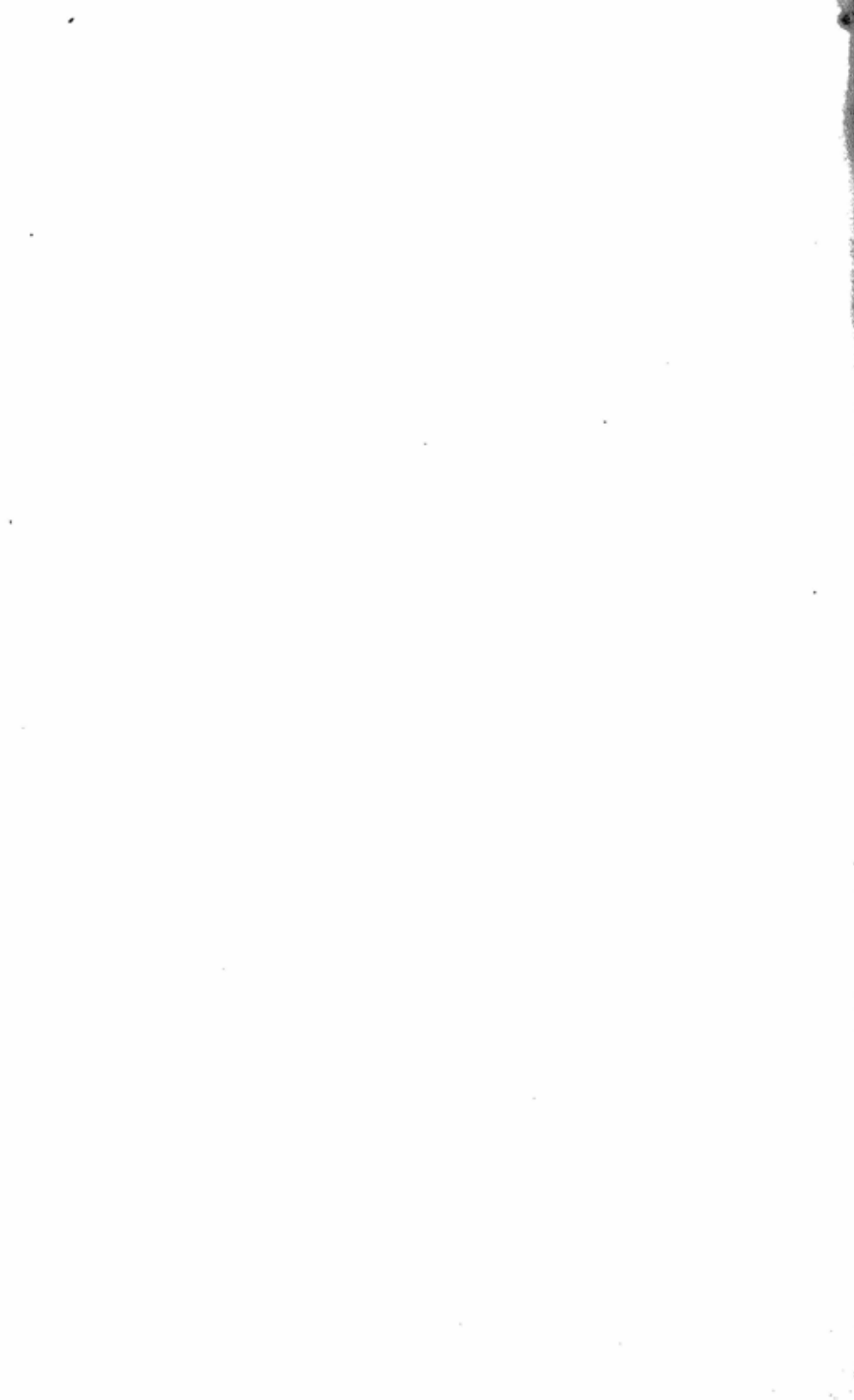
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PART THREE **SUDAN**



Mr. Eric Penn, District Commissioner in Wadi Halfa gave the expedition¹ every assistance and encouragement. Permission² for anthropometry and the collecting of stone implements from surface sites was telegraphed by the Department of Antiquities in Khartoum.

We were invited by Oliver H. Myers, of Gordon Memorial College, Khartoum, to examine the rock drawings discovered at Abka, ten miles south of Wadi Halfa, shortly before our arrival. Myers has excavated and recorded about forty groups of rock drawings on basalt boulders over a wide area. Remains of all periods from Neolithic to Christian were found. It is hoped by the correlation of pottery, stone implements, and rock drawings to be able to date the latter. Valuable information was also obtained on the fluctuations of the Nile level during various periods. Harley F. Cope, Jr., took an excellent series of photographs of these rock drawings; a set of prints was given to Mr. Myers. On this last visit we were accompanied by Mr. Peter L. Shinnie, newly appointed Commissioner for Archaeology in the place of Mr. A. J. Arkell, who had left to take up an appointment at the University of London.

The District Commissioner stated that no anthropometric data³ had been recorded on the Nubians in the Wadi Halfa area; with the cooperation of Mr. Myers, I measured twenty-six men in Abka; Keith Marker acted as recorder and photographer. We also recorded some words and phrases in Nubian (see Appendix A.) Sheikh Ahmed Mohammed Khalil received us most hospitably. We were assisted by Mohammed el-Jemri, sub-Mamur, Wadi Halfa, who accompanied us, and Mekki Mohammed Ahmed, surveyor, Sudan Surveys Department, Khartoum, as interpreter. The latter was working with Mr. Oliver Myers of Gordon Memorial College, Khartoum, making a map of the distribution of the petroglyphs in the Abka region.

Just south of Wadi Halfa on an island in the Nile live the "Magyarnarti," Magyars from Hungary. The Nuba stated categorically that they can be recognized easily both by appearance and naturally by their language. Time did not permit a visit to this interesting colony.

The Museum in Wadi Halfa (open daily at 6:30 A.M.) is housed in several large rooms. The exhibits include zoölogical and geological specimens, archaeological material, ethnological objects including those of local Arab origin and Sudan native handicrafts.

We left Wadi Halfa on March 8, 1948, and arrived at Abu Hamed at sundown on March 11. We were received by Omda Ali Omar el-Bashkir and shown to the rest house placed at our disposal by the Sudan Government.

During our five-day halt I recorded anthropometric data on thirty-eight Rubatab tribesmen. Shinnie and I crossed the Nile in a large sailboat (markab) to Gezirat el-Mograt, the island lying across the river opposite Abu Hamed.

One day was spent in visiting Hagar el-Mirwa and seeing Ancient Egyptian carvings and a cartouche. We also visited nearby El Koneisa.

On March 13 we left Abu Hamed for Khartoum, arriving there at midnight on March 16.

Sir James Robertson, Civil Secretary and Acting Governor-General, expressed a keen interest in my proposed survey work in the Khartoum area. With his support and the assistance of B. A. Lewis in the Secretariat and the District Commissioner, Khartoum, and Paramount Sheikh Mohammed el-Mek, I recorded anthropometric data on thirty-eight Gumueya tribesmen at Umm Disa, eight miles south of Khartoum.

Fifteen miles north, on the road to Wadi Saidna, Mr. and Mrs. Shinnie, Ibrahim, and I found a Neolithic "gouge-culture" station with one small gouge, showing traces of polishing, rubbing stones, pounders, and sherds with many types of incised designs. These objects occurred within an area of five acres north of Kereri village just off the main road toward the Nile.

The following supplementary material has been placed on Microfilm No. 3226, pp. 174-308, in the American Documentation Institute, 1719 N Street, N.W., Washington 6, D.C., where a copy may be purchased:

No.	Title	Pages
1	The Land and the People.....	12
2	Historical Outline.....	46
3	Traverse from Wadi Halfa to Khartoum.....	42
4	An Outline History of the Sudan, by A. J. Arkell.....	17

No.	Title	Pages
5	Notes on Halfa Province, by H. D. Jackson..	7
6	Arab Tribes of Khartoum Province.....	3
7	Glossary.....	4

On March 29 I flew to Nairobi to join the Kenya section of the expedition. I left the Sudan grateful for what we had been able to accomplish in a very limited time and with the hope that I might return to trace the Stone Age and modern racial links to South-western Asia.

THE LAND AND THE PEOPLE

In this chapter I shall discuss primarily the Northern Province, which includes Wadi Halfa, and Berber Province, with Abu Hamed.⁵ The distance from Wadi Halfa via Abu Hamed to Khartoum is 530 miles.

In this northern part of the Sudan lie the Libyan, Nubian, and Bayuda deserts. Since we are concerned with only the two latter areas, I shall not include a description of the Libyan Desert, which lies to the west of the Nile.

The Nubian Desert lies between the Nile and the Red Sea hills, north of the Debba-Merowe-Abu Hamed bend, and is perhaps the most perfect desert in the world. Water holes exist at Jebel Kuror, and there are wells at Murrat and in the hills to the east of Stations 4 and 5 of the railroad. Vegetation is nonexistent except in the Wadis Murrat, Gabgaba, and a few other places. Jennings Bramly explored the northern part extensively by car during 1935. Two years later Wakefield crossed by car without serious difficulty from Dongola to Kareima.

The Bayuda Desert occupies the inner hook of the Nile, northeast of a line from Debba to Omdurman, and has an area of about 19,000 square miles. After a rain it is like a poor savanna. Wells are reasonably plentiful. This region is sparsely inhabited by the Umetto Kababish to the west, the Khawawir of Kordofan and the Sowarab Shaigia (Shaiqiya) in the center, and the Hassaniya, Khawawir, Awadiya (Jaalin, Jaaliyin, or Gaaliyin), western Fadniya, and Monassir to the east. Cars have crossed from Kitiab to Merowe (170 miles) and to Kortí (210 miles) in from ten to twelve hours.

NORTHERN PROVINCE

Located between latitude 17° - 22° N and longitude 24° - 34° E, this province forms a part of the great Nubian and Libyan deserts. The Nile Valley runs in a general south-north direction through the east center of the province.⁶

The entire agricultural life of the province is centered in the Nile Valley. From the northern end of the Shabluka Gorge (Sixth Cataract) in the south to the

Egyptian border in the north a narrow strip of land on either side of the river, varying in depth from 4 to 4,000 meters, comprises the entire cultivable area.

The most northerly province of the Sudan has an area of about 115,000 square miles, with a population in 1937 of 43,000 concentrated along the river valley, but with nomads visiting occasionally the oases of Selima and Lagia in the Libyan Desert west of the Nile. Jebel Uwainat, where rock drawings were found, lies far to the west; but since it forms a prominent landmark, all travelers pass that way.

In winter the climate is very agreeable for Europeans; in the summer, although sometimes uncomfortably hot, it is not unhealthful. The shade temperature varies from a maximum of about 120° F. in June to a usual minimum of about 48° F. in January and February, but even lower winter temperatures are frequently experienced on the Dongola-Halfa Reach. August, September, and October form the period of highest humidity. Sandstorms are of frequent occurrence in April, May, June, and July. The prevalent wind from November to April is from the north.

The rainfall varies in the province from south to north in a marked degree, the southern districts receiving on the average about seven inches of rain a year as compared to rare heavy local showers at Dongola and possibly no rain at all at Halfa. It is generally true that what rain does fall in any district occurs during July, August, and September.

AGRICULTURE

Although the nomads are chiefly dependent on their animals and on the camel-carrying trade, 90 per cent of the sedentaries are engaged in agriculture, in which they have reached a relatively high standard through long experience, natural intelligence, and readiness to work.⁷

Water Distribution. -- Since rain is scarce in the province, with the exception of about 10,000 feddans of rain lands in the southern districts, it ceases to be a limiting factor so far as cultivation is concerned.

With the exception of wells the only source of agricultural water supply is the Nile, and by the height and extent of the Nile flood the annual degree of prosperity must be measured. The flood peak is reached during the first half of September.

The chief methods of water distribution⁸ are:

Gerfs and islands inundated by the river at flood.

Basins or low-lying areas adjacent to but inland from the gerfs, inundated by the river at flood, usually through the agency of artificially dug canals that may or may not be capable of artificial control.

Cultivation on the mainland or islands irrigated by water wheel (sagia) direct from the river.

High land, not within the river flood area, irrigated by water wheels working from wells sunk to the river's water table.

Areas similar to basins or sagia lands irrigated by mechanical pumps. The introduction of pumps and the artificial control of basins are the progressive steps in water distribution since the days of the Pharaohs.

Under the above headings and including rain-lands the total cultivable area is made up approximately as follows:

Group	Feddans
Gerfs and Islands.....	60,000
Basins.....	130,000
Sagias and Mataras.....	85,000
Pumping Schemes.....	42,500
Rain-lands.....	<u>10,000</u>
Total.....	327,500

In any one calendar year it is unlikely that more than half this total area will be actually under crop cultivation, owing partly to the necessity of maintaining adequate bare fallows on the pumping schemes and sagias, and also partly to the fact that the bulk of the basins, especially in the Dongola area, are maintained only as grazing grounds for stock.

Soils. -- The following distribution and classification were in force during 1937:

Sagia land or a fringe along the river banks varying in depth from zero to 1,000 yards and on islands not flooded at high river. This soil is in general a rich free-working alluvial loam and is very fertile.

Gezira type, associated with the above and of a similar nature but laid down more recently. In general, it is lighter owing to its higher sand content.

Karu, which adjoins sagia land away from the river.

It is a heavy clay of poor texture and drainage and is often inclined to be salty -- typical basin soil.

Wadi or Atmur, found in the region of rain-flood watercourses, with "Atmur" more properly rain areas not flooded by watercourses. It usually consists of a thin layer of sandy soil deposited by rain floods.

Sagia land and Gezira soils can be counted on to produce good returns for all crops grown. Karu land, when annually flooded -- as in basins -- produces fair crops of dura, lubia, and hummos, but if no cultivation is undertaken, it rapidly becomes fouled by weed growth, usually grasses. Under pump irrigation and with efficient bare-fallowing and leguminous cropping in the rotation, this soil will produce good crops of cotton, wheat, and barley, but it will not stand constant cropping. Wadi soil, when sufficiently flooded, will produce a fair crop of dura or dukhn.

Methods. -- Seen through Western eyes, the usual methods of tillage and general agriculture practiced in this province appear very primitive. Except on the largest pumping schemes, mechanically drawn implements are unknown; in fact it is exceptional to see an iron plow in use anywhere outside the pumping schemes.

Hand cultivation by means of the toria (a short-handled, vertical digging hoe) is the generally accepted method, and the results obtained leave much to be desired. Other implements of the harrow, cultivator, or horse-hoe class are almost unknown. It is obviously unnecessary to practice crop rotation on areas annually inundated by the river flood. On all government-managed pumping schemes and the larger private estates strict rotations are adhered to, but on the sagia areas the usual method employed is to bare-fallow an area only when it has become so foul as to be unworkable. It stands to reason that by the latter method only low average yields can be obtained. Owing to the scarcity of land sufficiently close to the river to be irrigated, it is not uncommon for a plot to be cropped twice or even three times a year.

Crops. -- By far the most important crop grown between Berber and the Egyptian frontier is dates. The culture and economics of the date crop is such an important and specialized science that it has been made the subject of the section that follows.

The chief crop grown entirely for export is cotton

(American variety). When foreign markets and local yields are favorable, dura, wheat, and beans and other pulses are also exported to a limited extent.

However, with the exception of cotton, any surplus over local requirements of all crops grown is generally sold for consumption in the internal markets.

The most important crops for local use are dura for food and lubia for forage. The latter is doubly valuable, since it not only provides a valuable fodder for animals but, being leguminous, it is of greatest importance in maintaining soil fertility.

Gerfs, inundated islands, and basins produce dura, lubia, hummos, maize (in the southern areas), and dukhn. Barley, wheat, and lupins are fairly popular on these areas, although in 1938 barley showed a steady decrease in importance.

The crops are sown by selluka as the flood subsides, and no further watering is given. Yields are necessarily low when compared with those obtained from land under irrigation. In the early spring the sand banks are sown with watermelons.

Sagias, mataras, and small private pumping estates produce dura, lubia, maize, wheat, barley, beans and other pulses, bamia, and onions. Dura, lubia, maize, and bamia may be sown in the early summer for late summer supplies or may be sown as autumn crops. Wheat, barley, beans, and onions are winter-sown, being harvested from early March to mid-April.

AREAS OF FOOD AND STORAGE CROPS, 1937

Crop	Irrigation	Flood	Total
Bamia.....	800	.....	800
Barley.....	1,650	2,000	3,650
Beans.....	2,300	250	2,550
Berseem.....	500	.....	500
Dukhn.....	1,750	2,000	3,750
Dura.....	20,000	30,000	50,000
Hummos.....	.....	2,500	2,500
Lubia.....	10,000	15,000	25,000
Lupins.....	.....	2,000	2,000
Maize.....	4,000	2,500	6,500
Onions.....	1,100	.....	1,100
Other Pulses.....	600	.....	600
Senna.....	200	.....	200

AREAS OF FOOD AND STORAGE CROPS, 1937

Crop	Irrigation	Flood	Total
Simsim.....	1,000	.....	1,000
Wheat.....	12,500	2,500	15,000
Vegetables.....	500	100	600
Fruit.....	300	.....	300
Totals.....	57,200	58,850	116,050

On the larger private estates and government-owned pumping schemes, the same crops are grown as for sagias, and cotton is also included in the rotation. In 1938 approximately 11,000 feddans of cotton were being grown annually, comprising 6,500 on private estates and 4,500 on government pumping schemes.

Cotton reacts to varying climatic conditions in marked degree and is also extremely prone to attack by various pests and diseases, but in an average season it should be safe to estimate a return of 315 rotls of seed cotton per feddan.

In the Shendi and Berber districts, in order to minimize damage by pink bollworm, the crop is sown in early May and is picked from mid-August until early November; in Merowe and Dongola districts sowing takes place in July, and picking continues from December until early April.

Pests. -- Among the more common are:

Cotton: pink, American, Sudan, and Egyptian bollworm; cutworm; wilt; plant asal; white ants; cotton stem borer; asal (owing to Aphis attack).

Dura: birds, stem borer, asal, smut, buda or well (Striga hermonthica).

Maize: stem borer, asal.

Lubia: thrips, asal.

Wheat: rust, eelworm.

Barley: smut.

Beans: thrips, fungoid diseases.

Locusts: attack all crops.

In general, most of the pests mentioned above can be kept in reasonable control, but in 1938 the enforcement of the control principles in the general agricultural practice was far from being attained.

Successful experiments had been made, particularly in Merowe, in fruit- and vegetable-growing. Excellent grapefruit, oranges, tangerines, lemons, limes, mangoes, grapes, bananas, guavas, and European vegetables of all

kinds were being grown not only in government gardens but to an increasing extent by enterprising natives. In 1938 the supply was insufficient to meet even the local demand for fresh fruit, and there was room for profitable expansion of this industry.

Handicrafts. -- Regrettably there were few handicrafts -- the making of damur (native cotton cloth), mats, baskets, pottery, carpentry, leather work, and silver work being the most flourishing. Efforts were being made to preserve and stimulate native handicrafts, but cheaper and more attractive articles were being brought in from abroad whenever the price of dates and cotton was sufficient to furnish the native with some additional spending money.

DATES AND DATE CULTIVATION

The date palm (Phoenix dactylifera) is one of the oldest cultivated plants, but very little is known of its origin.⁹ It existed in Africa before the invasion of the Arabs during the seventh century, and is believed to be indigenous to northern Africa and Arabia. Probably first grown extensively in the valleys of the Euphrates and Tigris, the date palm thrives in hot and arid climatic conditions if its roots are able to reach a continuous supply of water.

The chief local varieties of dates were evidently well established in the northerly part of the Nile Valley at Dongola more than 100 years ago; and to the present time, dates from this district are noted for their superior quality. Most of these local varieties are said to have originated in Algeria and to have been imported from Upper Egypt three centuries ago. Other varieties, such as Mishrig and Medina, are thought to have developed from dates originally brought from Arabia.

The subsequent slow spread of culture of these desirable varieties to the rest of the Northern Province may be accounted for by the insecurity resulting from tribal strife, by the slow and difficult methods of transport, and by the fact that all date shoots had to be brought upstream from the north.

MAIN STATISTICS OF NORTHERN PROVINCE DATE INDUSTRY

Category	Amount
Trees taxed.....	1,540,771
Total estimated yield.....	23,000 tons
Total estimated value (estimated flat rate of 4 P.T. per keila of 10 kilos).....	££. 92,000
Exports to Egypt (1936) sacked dry dates.	4,212 tons
Exports to Abyssinia (1936) sacked dry dates	14 tons
Exports to Eritrea (1936) sacked dry dates	508 tons
Value of these exports.....	££. 38,604
Date tax in 1935.....	££. 25,017
Date tax in 1937 ¹⁰	££. 22,017
Water rates on pumping schemes.....	££. 1,200
Amounts consigned to places in Sudan by Sudan railways in 1936.....	12,328 tons
Quantities dispatched to Metemma, Omdurman, El Obeid, Nahud, and Fasher, by camel from Tangasi, Debba, and Korti.	1,150 tons (estimated)

In 1938 the total population of the Nile Valley from Berber to the Halfa boundary was believed to be 349,370; to these people the date is an important daily food, and most of them rely directly or indirectly on the date industry.

Comparison of dates with other crops. -- Comparative local crop values are given, so that the reader may appreciate more fully the enormous benefit to the native of good quality dates, which, whatever the market price, represent a most valuable and dependable reserve. The capital value of the trees and the annual date crop are used as security, like a bank account. The overwhelming superiority over other crops of the date when properly grown in suitable soil is indicated below:

	££.
Wheat. -- 1 feddan yield @ 4 ardebs @ ££. 1.200 =	4.800
10 kantars tibn @ 5 P.T. per kantar	0.500
Gross return per feddan.....	5.300
Dura. -- 1 feddan yield @ 4 ardebs @ 84 P.T. =	3.360
700 bundles ghassab @ 3 P.T.....	2.100
Gross return per feddan.....	££. 5.460
Dates. -- 1 feddan yield: 100 trees spaced at 6-7 meters.	
Average yield 3 keilas per tree at 6 P. T. per keila.	
Gross return per feddan.....	££. 18.000

It should be remembered that, whereas the grain products are an annual crop requiring rotation to maintain satisfactory production, dates produce crops perennially, outliving the planter.

A single-stem adult tree in full bearing is valued at from 70 P.T. to £1, whereas one of a clump -- that is, an offshoot tree -- is worth only from 30 to 70 P.T. These are current valuations in use during 1938 by the native courts. Date-tree values vary with the market price of date fruit.

AREAS OF BEST-KNOWN VARIETIES

Variety	District
Barakawi.....	Dongola, Merowe, Mahas, and Sukkot
Gondeila.....	Dongola, Mahas, and Sukkot
Bint Amoda.....	Dongola, Mahas, and Sukkot
Kulma.....	Mahas, Merowe
Mishrig Wad Lagai....	Rubatab, Abu Hamed
Mishrig Wad Khatib...	Rubatab, Abu Hamed
Medina.....	Kassinger, Merowe
Gargoda.....	Wadi Halfa

Crop Tests and Average Yields of Date Trees. -- When consideration is taken of the wide divergence of land quality in the different localities, watering of the trees (or lack thereof), seasonal fluctuations, the varying individual yields as the tree develops, and whether grown as a single tree or in a clump, it will be realized that the estimation of the average yield presents an uncommonly difficult problem. In the light of recent crop tests, it might appear that the average yield has been considerably underestimated.

A large-scale crop record was taken from 3,040 single-stemmed taxed trees growing on land the quality of which varied from poor to good. The trees of Barakawi and Gow (seedlings), which were moderately well watered, resulted as follows:

Year	Yield
1935.....	72 rotls per tree
1936 ¹¹	67 rotls per tree

CROP TESTS, MEROWE DISTRICT, 1937

Type	No.	Bunches	Rotls	Average ¹²
Parent trees.....	41	643	4,873	119
Offshoot trees.....	65	419	2,866	44
Totals.....	106	1,062	7,739	73

The average weight of a bunch was:

Type	Rotls
Parent tree.....	7.5
Offshoot tree.....	6.8
Average.....	7.3

It is hardly likely that the average yield would be less than 15 kilograms of fruit per tree, even allowing for areas where the trees have adapted themselves to a meager water supply by giving a reduced annual yield, or where watered biannually, giving a full yield only every other year.

Market Values and Transport. -- The practical market value to the grower varies with his proximity to markets. Heavy transport costs by native boat, steamer, and rail from outlying date-growing districts make severe inroads on the growers' share.

Camel transport is cheaper than rail, and consequently date growers and merchants still send quantities of sacked dry dates from Debba, Korti, and Tangasi across to Omdurman and Metemma at prices with which the Sudan railways cannot compete.

The nomad camel-owning Arabs, who transport the dates, sometimes carry tea, coffee, cloth, and other items on the return journey. This trade provides these camel owners with some much-needed cash with which to purchase their requirements of tea, sugar, and other imported goods.

Dry and Soft Dates. -- The Sudan has the lowest relative humidity of any date-producing region of which weather records are available, and is therefore well suited to the production of dry dates. However, three or four varieties of soft dates are also packed; and there are at least two varieties that may be either dry or soft, according to the treatment of the fruit. At Abu Hamed, Mishrig dates compete with imported soft varieties from Basra (Iraq) and Arabia.

IMPORTS OF FOREIGN DATES, 1936

Locality	Tons	Egyptian Pounds
Eritrea.....	2	13
British India.....	29	167
Iraq.....	1,400	6,616
Arabia.....	1,150	8,378
Egypt.....	37	281
Totals.....	2,618	£E. 15,455

CHIEF VARIETIES

Name	Notes
Barakawi.....	Premier commercial main crop: dry date.
Bint Amoda.....	Excellent dry date, in great favor as fresh date (<u>ruttab</u>); numerically restricted, but is increasing.
Gondella.....	Soft or dry, according to treatment; is very popular. The tree is an unusually strong, virile grower, and its increased adoption is limited to the extent to which owners agree to sell the shoots.
Kulma, Black.....	Soft or dry, according to treatment. This variety is scarce. Its fruit is extremely large in comparison with other varieties.
Kulma, White.....	Soft or dry, according to treatment. The variety is very scarce. Its fruit is of an unusual appearance, being very broad and somewhat plum-shaped.
Mishrig.....	A popular small, sweet soft date with a large stone. There is a small established trade in this variety, packed in matting, to the western Sudan.
Medina.....	The earliest-ripening soft date. It is used as <u>ruttab</u> , the fruit being large and well-flavored. The tree has an extremely strong, virile habit of growth.
Gargoda.....	A dry date of rather poor quality; popularity probably owing to its cheapness. Among other things, vinegar is made from it.

Methods of Date Culture. -- Generally speaking, date culture is in the hands of small native cultivators, whose choice of date varieties is often limited to local selections.

Apart from the Sukkot, Mahas, and Dongola districts, there are large areas with an undue proportion of low-quality dates, for which primitive propagation methods have been actively responsible.

The date tree is so long-lived that replanting is seldom necessary. The widespread practice of leaving clumps of dates (matmuras) on the trees often results in undersized fruit, and these clumps harbor pests. In some areas the date trees are grown on retentive soil, thus obtaining a minimum water supply remain, in effect, single trees. The offshoots of these trees fail to grow up, remaining stunted at the tree bases. These shoots, of good varieties, are excellent propagation material, but it is difficult to persuade owners to sell them.

LIVESTOCK

Most of the animals of the Northern Province are dependent on the rainfall and the state of the Nile for their well-being. In years of scanty rains, grazing conditions away from the river are very poor, and the nomads are forced to drive their herds and flocks to the Nile banks for grazing and watering. Nowhere is grazing plentiful in the Northern Province, but it is most easily obtained in the rain-land areas of the south and on the Dongola basins. If the rise of the river has not been normal, the available grass is quickly eaten; starvation conditions result, large numbers of animals die, working oxen are threatened, and the government must come to the rescue with forage grown on the pump schemes. In general, the grazing is good from August until December, fair from January until March, and poor from April until July. Tree grazing for camels in the hinterlands is relatively good throughout the year, and in general they come to the river only for water.

The cattle are of the "Arab" or "Northern" type with relatively short horns and a hump. They are hardy and have a strong resistance to hunger and thirst and to certain diseases that are fatal to imported stock. Their milk is rich, having a high butter-fat content. These animals are used extensively by the riverain natives for

plowing and for turning water wheels. When hand-fed they fatten well for slaughter. Plague is the most serious contagious cattle disease. Although outbreaks occurred almost yearly in the province, effective prophylactics (serum and vaccine) were available for control. Outside the quarantine parks no serious outbreaks of hoof and mouth or anthrax occurred.

The sheep are typically long-legged and long-tailed with short rudimentary horns. Instead of wool they have hair, which is used for making mats and padding for saddles. Sheep pox was occasionally seen but is of little importance except in export animals.

The goats are typically black, often with gray or white heads. The majority breed twice yearly and are good milkers. Outbreaks of contagious pneumonia periodically caused heavy losses, and mange was occasionally reported.

Bishari, Abbadi, Hassani, and Mansuri camels are found in the province. This province and Kassala province produce the best strains of riding camel in the Sudan. Camel milk is the staple diet of many of the nomadic desert tribes. Trypanosomiasis, the dreaded camel disease of other provinces, is nonexistent.

The commonest type of donkey is small but extremely hardy and can carry loads up to three hundred pounds. The riding donkey is a large, well-grown animal; it is also a good weight carrier that can travel at five miles an hour over long distances.

Horses are bred in a number of districts along the river. The Dongolawi pony has been bred in the province since historic times, but is gradually dying out as a result of horse sickness and interbreeding with Arab and English blood. The so-called African horse sickness, which is serious further south, is of minor importance north of the sixteenth parallel.

Exports. -- Since 1933 the province had been allotted the period from January to April for the export of cattle to Egypt (average number exported for 1934-1936 inclusive was 1,140). Cattle have been exported for several years to Eritrea. Sheep, camels, hides, skins, and clarified butter are also exported.

Fauna. -- In general, animals of all kinds were rare, even along the banks of the Nile. Among those seen by the expedition from Wadi Halfa to Hagar el-Mirwa (about forty miles south of Abu Hamed) were: gazelle, hyenas,

foxes, jackals, bats, birds, snakes, lizards, scorpions, spiders, and mosquitoes. Some collections were made for study.

The following notes were obtained from the Nubians at Abka:

<u>Animal</u>	<u>Locality</u>
Addax.....	Desert west of Nile
Addra gazelle.....	Desert west of Nile
Dorcas gazelle.....	Any part of the desert
Isabella gazelle.....	Any part of the desert
Soemmerings gazelle (Ariel).....	East of Khartoum-Atbara Rail- way and south of Atbara River
Oryx.....	Desert west of Nile
Wild sheep.....	Wadi el-Melik
Cheetah.....	Wadi el-Melik and Wadi el-Hawa
Hyena (striped and spotted).....	Everywhere
Lion.....	Few in Wadi el-Hawa
Wild dog.....	Wadi el-Melik and Wadi el-Hawa
Desert wolf.....	In hills along Nile
Civet cat.....	Nile cultivation area
Tree cat.....	Nile cultivation area
Genet.....	Nile cultivation area

BERBER PROVINCE

This province extends from the Shabluka Gorge in the south to Abu Hamed, northward by a kind of corridor to the Egyptian frontier, and westward to the Dongola Province boundary at Berti. The province is divided into four districts, with headquarters at Berber, Ed Damer, Shendi, and Atbara; the province headquarters are at Ed Damer.

Berber has three main topographic divisions. Firstly, there is the sandy, hilly desert between the Egyptian frontier and Abu Hamed. This area, with practically no rainfall, produces no food and has little water and grazing. Large camel convoys cross this desert in going from Abu Hamed to Korosko and to Darau in Egypt. The second section is along the river from Berti-Abu Hamed to the Shabluka. Along the left bank of the river there is a narrow strip of cultivation, widening just north of Abidia and becoming more than a mile wide in certain

places. Behind this cultivated strip there is a rocky desert; on the right bank of the river there is only sandy waste. The third topographic division is the desert area away from the river. South of Abu Tleb on the west bank the country is sandy and stony with some small hills and shallow wadis, but northward the desert levels out and there are many belts of deep sand and thorn scrub. Still further north the country becomes very hilly. Much water can be found away from the river at Jura, but nowhere else. On the east bank of the river this section is rocky and has no water. The remainder of the country on the east bank is interspersed with many hills and wadis, and in the central section there are large areas of stony ground.

The cold season lasts from about the beginning of November to the middle of April. Although the nights are cold in December, January, and February, the daytime temperature is frequently high, even in winter, and occasionally exceeds 108° F. after the middle of March. The heat in summer is excessive and oppressive; heavy rains sometimes fall in July, August, and September.

Health conditions are generally good. However, there is much malaria, particularly when the river is low. Bilharziasis is common from Bouga to the boundary of Dongola, and great care must be taken to avoid infection either from drinking water or bathing in a branch of the Nile where there is no strong current.

CLIMATIC DATA FROM ATBARA, 1937

	Jan.	Feb.	Mar.	Apr.	May	June
1.	37	29	28	25	22	17
2.	67.1	72.6	77.9	87.0	93.8	95.0
3.	82.4	88.4	95.4	104.2	106.0	109.4
4.	54.5	61.2	63.8	71.8	79.6	80.6
5.	N11	N11	N11	N11	N11	N11
6.	N	N	N	N	N	N

CLIMATIC DATA FROM ATBARA, 1937

	July	Aug.	Sep.	Oct.	Nov.	Dec.
1.	21	31	25	23	27	38
2.	91.8	90.2	92.2	89.6	80.0	76.4
3.	105.2	103.2	107.2	103.1	94.8	90.4
4.	80.0	79.6	79.4	77.0	67.2	64.4
5.	0.12	2.64	0.21	0.02	Nil	Nil
6.	SW	SW	SW	E	N	N

1: Mean Relative Humidity; 2: Mean Temperature in F°;
 3: Mean Max. Temperature in F°; 4: Mean Min. Temperature
 in F°; 5: Rain in inches; 6: Prevailing Wind Direction

Crops are harvested three times a year; Indian corn, millet (dura or dhurra), and dates, in September and October; beans (lubia), millet dukhn, and vegetables such as onions, mulukhia (a native vegetable like marsh-mallow), bamia (a native vegetable, Hibiscus sp.), badinjan, and tomatoes, in February and March; wheat and barley in April and May. In addition, a rain crop of millet is harvested in December and January in the southern part of the province. In an average year 120,000 ardebs of millet, 20,000 of lubia, 17,000 of wheat, 14,000 of millet (dukhn), and 4,000 of barley are harvested.

Food supply is completely dependent on the height to which the Nile rises and on the amount of rainfall in the area; in favorable years there is ample food for both men and animals, but in unfavorable years supplies of all kinds must be imported. As in the Northern Province, water distribution constitutes the major problem in agriculture; the methods of irrigation are similar.

IRRIGATION BY DISTRICT, 1937

Methods and Area	Shendi	Atbara	Berber	Merowe	Dongola
Private Pumps.....	13	1	13	18	19
Sagias.....	523	28	1,150	2,435	2,435
Shadufs.....	...	...	...	11	29
Feddans.....	9,192	188	5,372	13,873	27,916

In the Abu Hamed area close to the Nile banks there were many species of birds. Across the river, near extensive low sand banks opposite the rest house, hundreds of birds were seen at dawn and sundown. Among the palm groves snakes were rare, but lizards abundant. Small

crocodiles basked on rocks near the banks. A large turtle was observed gliding slowly downstream. A few days before our arrival in March a hippopotamus had been shot. The Omda stated that these animals were rarely seen at Abu Hamed. There were gazelle, foxes, hyenas, jerboas, and lizards in the nearby desert.

There are nine Arab tribes in the province. The following are all sedentary tribes: Monassir, living between Bertí and Shemkhia; the Rubatab, from Shemkhia to near Bouga; the Jaalin, from Berber to south of Shendi; and the Shaigia, from south of Shendi to the Shabluka. The Monassir have a few seminomadic sections. The nomadic tribes are: the Ababda, from Berber to Darau in Egypt; the Sowarab, of the Bayuda Desert; the Fadniya, at Umm Hattab and Goz Naim; and the Hassaniya, living in the Wadi Bayuda and at Jaqdul, Abu Tleb, and in the neighborhood of Metemma. The Mirafab are believed to be the original occupants of Berber.

Anthropometric data were recorded on twenty-five Nubians at Abka south of Wadi Halfa and on thirty-seven Rubatab at Abu Hamed.

POPULATION

According to the statistics compiled in 1936, the area and population¹³ of the various districts were:

District	Square Miles	Population
Halfa.....	76,525	70,112
Dongola.....	94,110	87,828
Merowe.....	23,435	110,753
Berber.....	26,180	80,677
Atbara (with Ed Damer)....	5	32,350
Shendi.....	<u>15,945</u>	<u>129,610</u>
Totals.....	236,200	511,330

As previously stated, 99 per cent of the total area is uninhabited desert, the largest uninhabited areas covering some 94,000 square miles in Dongola District and 76,400 square miles in Halfa District.

POPULATION OF TOWNS

<u>Town</u>	<u>No.</u>
Wadi Halfa.....	10,597
Dongola.....	6,149
Merowe.....	950
Kareima.....	2,350
Abu Hamed.....	890
Berber.....	15,000
Atbara.....	29,050
Ed Damer.....	3,300
Shendi.....	<u>14,237</u>
Total.....	82,523

Of the total population in 1936, 504,721 were natives of Africa excluding Egypt, 5,001 were Egyptians, 615 were Europeans, 964 were Syrians, and 29 were Indians. Below are given the approximate numbers of the principal sedentary and nomadic tribes:

SEDENTARY GROUPS

<u>No.</u>	<u>Tribe</u>	<u>Men</u>	<u>Women</u>	<u>Children</u>	<u>Total</u>
1	Nubians				
	(a) Halfa.....	9,655	11,391	11,599	32,645
	(b) Sukkot.....	4,678	4,693	4,714	14,085
	(c) Mahas.....	4,998	5,713	6,805	17,516
2	Danagla.....	18,377	26,410	36,962	81,749
3	Fung.....	5,515	8,020	10,023	23,558
4	Bedeiriya.....	4,630	6,435	8,542	19,607
5	Shaigia (Shaiqiya)	22,500	29,450	37,000	88,950
6	Monassir.....	2,800	3,330	2,840	8,370
7	Rubatab.....	7,530	7,535	18,544	33,609
8	Mirafab.....	10,105	12,033	10,060	32,198
9	Jaalin.....	<u>26,900</u>	<u>28,650</u>	<u>31,650</u>	<u>87,200</u>
	Totals.....	117,688	143,660	178,739	440,087

NOMADIC GROUPS

No.	Tribe	Men	Women	Children	Total
10	Nomadic Jaalin....	3,900	4,300	4,160	12,360
11	Nomadic Shaigia...	1,000	1,300	1,281	3,581
12	Kababish.....	1,862	2,575	3,058	7,495
13	Ababda.....	2,150	2,400	2,304	6,854
14	Gerarish.....	503	650	652	1,805
15	Hassaniya				
	(a) East.....	770	860	840	2,470
	(b) West.....	1,870	2,075	2,060	6,005
16	Fadniya				
	(a) East.....	160	175	167	502
	(b) West.....	450	500	492	1,442
	Totals.....	12,665	14,835	15,014	42,514

Excluding the nomads (42,514) and town dwellers (82,523), most of the population are sedentary riverain people living in villages along the river and dependent on agriculture or petty trading for their livelihood.

The following notes on the sedentary and nomadic groups are appended:

1. Nubians. -- In the entire Halfa District and in Old Dongola Province as far south as Debba, where the Nile turns north again, the people are Nubians.

The earliest inhabitants of northern Nubia were contemporaries of the Predynastic Egyptians. Both buried their dead in the same way and in cultural matters had marked similarities. It is probable that in the earliest period they were devoid of all Negro characteristics. Later, about the time of the third dynasty, Negro types began to settle in Nubia as far north as Aswan. From that time the population became a mixture of early Nubian and dynastic Egyptian, with an ever increasing Negro element (see MacMichael, 1922). Despite a later admixture of Arab blood, they still retain, particularly in Halfa District, the short squat nose and thick lips that are a legacy of this Negro element.

They have also retained their own language, and thus both they and the inhabitants of the whole of the Halfa-Aswan Reach are known to the Arabic-speaking inhabitants of Egypt and the Sudan as Barabra (Berberines). With the spread of education and their wanderings abroad in search of work, most of the men speak Arabic, but few of

the women outside the towns speak more than a few words.

Intermarriage between Nubians and Arabs is comparatively rare. The Nubians are unwarlike and seldom seek service in the army or police, although this is less true of the Mahas than of the inhabitants of Sukkot and Halfa. Despite their migrations they are extremely conservative, with an intense love for the barren, inhospitable land of their birth.

2. Danagla. -- Those inhabitants of Dongola District who live between the Halfa boundary and Debba, although retaining the language and certain characteristics of the Nubians, are distinct from them in possessing less Negro and more Arab facial characteristics. They are essentially similar, except in language, to the Jaalin group. Curiously enough, their language is distinct from that of Mahas, Sukkot, and Halfa, but is the same as that of the Kenuz, who live north of the Egyptian boundary close to Aswan. They are chiefly to be found outside Dongola as small traders, servants, and employees. The important tribes in Merowe District upstream of the Danagla are the Fung around Debba; the Bedeiriya around their original homes at Kortí, Ambikol, and Genetti; and the Shaigia between Kortí and the Fourth Cataract.

3. Fung. -- These are descendants of the former Fung conquerors, who came from the south and took possession of the Nile Valley as far north as Dongola during the seventeenth century. They no longer retain the Fung dialect or any other Fung characteristic. Many of them have adopted the Berberine dialect of the Danagla, but the majority speak Arabic. They are good cultivators.

4. Bedeiriya. -- They have mainly intermarried with other Arabic-speaking tribes and are engaged chiefly in trade and agriculture.

5. Shaigia. -- Although too scattered to be of importance tribally, they are influential by virtue of their superior individuality. Upstream of the Shaigia in Berber District live the Monassir, the Rubatab near Abu Hamed, and the Mirafab around Berber and as far south as the junction of the Atbara with the Nile.

6. Monassir. -- They are partly nomadic and own an excellent breed of riding camel.

7. Rubatab. -- Formerly largely nomadic, they are now cultivators and produce some of the best dates grown in the Sudan.

8. Mirafab. -- The original occupants of Berber, they are described by Burckhardt as "forgetting every divine and human law in their pursuit of gain."

9. Jaalin. -- This important tribe with its numerous subsections, several of which are nomadic, extends from the Atbara to the Shabluka. Outside the Northern Province they are generally to be found engaged in trade, agriculture, or government employment.

10. General. -- The most significant characteristics of the majority of the northern riverain tribes are their readiness to travel in search of work and their intense love of home. As a result of their older civilization and of the influence of outside contacts, they have a higher standard of intelligence than most other tribes. It is probably not an exaggeration to say that more than 70 per cent of the clerical posts in government service and in commercial firms throughout the Sudan are filled by natives from the Northern Province and their kinsmen in Khartoum Province.

11. Nomads. -- Apart from the seminomadic Aliab, Nafaab, and Awadiya sections of the Jaalin and the Sowarab (Kofunga) and Onia sections of the Shaigia, the most important of the nomadic or seminomadic tribes are: the Kababish, in Dongola and Merowe; the Gerarish, partly in Dongola and partly in Halfa; and the Hassaniya, Fadniya, and Ababda, in Shendi and Berber districts.

PALEOLITHIC AND NEOLITHIC PERIODS¹⁴

Paleolithic. -- We did not locate any new sites belonging even typologically to this period in the northern area. However, the only searches possible were: between Wadi Halfa and Abka, along the east bank of the Nile; from Wadi Halfa to Abu Hamed, following the general course of the railway; and from Abu Hamed to Khartoum, via Berber, Atbara, and Shendi.

In the Khartoum Museum are exhibited some hybrid Acheulo-Levallois handaxes (with prepared platform techniques) from the desert eleven miles north of Abri on a disused channel of the Nile, indicating a different climate and a major alteration in the course of the river. One handax from Sai Island, Wadi Halfa District, is exhibited as are representatives of the pre-Chellean pebble industry from Nuri near Merowe (ancient Napata). In addition, there are the following: primitive

"Levallois" flakes with a prepared striking-platform technique from Tangasi, Merowe District, when the Nile was about a hundred feet higher than at present; a thin Levalloisian ovoid from Faras West near the Egyptian border; a hybrid "Acheulo-Levalloisian" flake from Wadi Halfa; a "Levalloisian" flake, prepared on a platform technique, from the west bank of the Nile opposite Wadi Halfa; developed "Levalloisian" flakes from Abu Tabari, about 300 miles west of Atbara and now desert; late Levalloisian (Sebilian?) tools and a core found on the Sikkal el-Maheila between Kareima and Dongola; and Upper Paleolithic lunates, two backed blades, and scrapers from the edge of a disused channel of the Nile at Amara West, Wadi Halfa District.

At Khor Abu Anga, near Omdurman, A. J. Arkell found a rich Paleolithic site from which about three thousand handaxes and other tools are in the Khartoum Museum.¹⁵ Accompanied by Mr. Peter Shinnie, I visited this wadi, which lies five miles south of Khartoum on the outskirts of Omdurman. Here we collected in an hour three hand-axes, one seven inches long, and many pounders.

Neolithic. -- During our brief visit we located some surface stations, probably Neolithic or later, which are listed in the following section.

At Jebel Uwainat, in the northwestern part of the Northern Province, Oliver Myers and his colleagues found a series of Neolithic and later rock drawings.

Post-Neolithic. -- Early in 1947 Myers discovered in an area of about one mile square at Abka, approximately fifteen miles south of Wadi Halfa on the eastern bank of the Nile, many thousands of rock drawings, some of them extremely weathered, others fresh especially after protection by sand from geological agents. Myers in the Times (March 31, 1948, London) described these rock drawing sites at Saras and Akasha, between Wadi Halfa and Dongola, were connected with the "Saharan" pottery previously discovered at Armant. In the course of the year a method was perfected for proving statistically whether two different potteries found together on a number of sites belonged to the same people. It was planned to investigate by the same method any cultural link between rock drawings and any accompanying occupation debris. Work was started at Wadi Halfa on a site of mainly Pharaonic drawings. Large quantities of Dynastic pottery were found. The camp was then moved to

Abka, at the edge of the Second Cataract and on the ancient highroad between Africa and Eurasia. A veritable gallery of prehistoric art was discovered. Only one site has so far been excavated, but it is clear that apart from the Pharaonic, Christian, and Islamic drawings, three main periods have emerged. The site chosen extends across the black line in the rocks known to mark the edge of an ancient Nile. It was found that below this line the implements and pottery were in the main heavily water-rolled, many of them being cemented into Nile gravel among large boulders. No charcoal remained, but hearths in the uppermost structure could be traced by burned stones. Above the black line there are no rolled shards or gravel pebbles, and the site is black with the remnants of charcoal. The pottery shows a gradual change from a Saharan ware found in the ancient river bed of the Wadi Hawa to a type similar to the Badarian wares found by Brunton in Egypt, the earlier predominating. The stone implements are either microliths in flint, quartz, agate, and cornelian or crude larger implements in an indurated shale.

From these two classes of material it seems that the culture is Neolithic and covers a great range in time. The most astonishing, if not the most exciting, find has been the bone debris. Giraffe and elephant bones and sometimes even carved tusks had been expected; but a basketful of fish bones, some bird bones, and fragments of eggshell, with one or two slivers of mammal bones, were uncovered. The formidable-looking men appear to be simple ichthyophagi, whose quarry was seldom fiercer than Nile perch. The fact that they drew giraffes and elephants is no evidence of their gastronomic tastes. It must be emphasized that proof of the association of the excavated remains with the drawings is probable but not yet established. One curious series of drawings on a horizontal rock face shows a serpent coming out of a circle from which emanates a series of rays -- a figure rather like an Egyptian ankh -- and a strange ribbonlike device. It is not improbable that this was a cult object, possibly linked with much later Egyptian religious ideas.

The second of the major groups studied includes a greater variety of drawings and even entire scenes. One, probably unique, has two giraffes eating from a date palm while a man armed with a throw-stick hunts them with his dog. There are gazelle hunts, a man holding an enormous

crocodile by the tail and preparing to give it the coup de grâce with his stick, and hunters shooting with bows and arrows. Almost all the men wear ostrich feathers in their hair.

In a third group of drawings, made by ranchers, the change in site is noticeable. Whereas the fish people always sheltered themselves from the north wind and the rain, and the armed hunters protected themselves from the sun, the ranchers sat on convenient knolls where they could watch and draw their grazing cattle. A few of their scenes are drawn with surprising precision and sense of form. It seems that a bell-like object often shown hanging from a cow's neck is a kind of halter. These pendicles are of great importance, for they are found in rock drawings as far away as Mauritania, whence comes Saharan pottery identical with that of Armant. The connections between these cattle people, the Armanti "Saharans," and Reisner's "C-Group" people seem likely, and give us our first fixed dates of from 2500 to 2000 B.C. and later.

Surface Stations. -- 1. On March 5, 1948, eight miles southwest of Wadi Halfa, at a point where the Nile is about 100 paces from a low hill rising 150 feet above present water level, I found a few flakes of fine-grained reddish quartzite. This hill lies close to the track between Wadi Halfa and Abka.

2. Amid the profusion of petroglyphs at Abka I found a fine example of a stone chisel with part of the matrix remaining on each surface. Since this proved to be a unique specimen, I gave it to Mr. Myers for his study collection.¹⁶

3. Jebel Serras Semna (?), eight miles northwest of railroad Station No. 2, on March 8, 1948:

Heavy stone pounder (2-1/2" in diameter) from surface about one mile west of railroad on this traverse.

Two pottery fragments (one incised); ostrich-egg fragment; one white quartz handax (3" x 2"); and three quartz flakes.

4. On March 8, 1948, on top of two adjacent hills two miles northeast of railroad Station No. 2 south of Wadi Halfa:

Quartz and rhyolite flakes.

Ostrich-egg fragments from northwestern slope midway between plain and summit.

Pottery fragments.

5. Hagar el-Mirwa, south of Jebel Hasari on March 8, 1948:

Choppers, scrapers, and flakes of various hard materials, only one of which was quartz.

Three quartz pounders showing considerable use.

6. Gezirat el-Mograt, across the Nile from Abu Hamed, on March 11, 1948:

Many pottery fragments from gravel bank west of ruined building.

Flint nuclei, choppers, scrapers, and flakes from gravels and small stream beds up to five hundred paces west of ruined building and at a level about twenty feet higher.

Rhyolite scraper.

7. On March 12, 1948, we visited some ruined buildings, called locally koneisa, west of Hagar el-Mirwa near Jebel Hasari, about twenty-five miles due south of Abu Hamed:

Series of quartz pounders.

Pottery fragments.

Part of gray stone quern.

8. A rocky outcrop about forty-five miles south of Abu Hamed beyond Jebel Hasari was visited on March 14, 1948:

Stone pounders; quartz, flint, and rhyolite nuclei and flakes.

One shard.

9. Camp site near Kilometer 433 (west of railroad), north of Khartoum, March 14, 1948:

Quartz point, scraper, broken point, and spatulate scraper with very narrow neck.

Flint core scraper and core flake.

Split gray pebble with white flecks.

10. Near Wadi Selim north of Atbara. Mile 593.5, March 14, 1948:

One quartz poulder.

Green stone choppers, scrapers, and flakes, and one excellent double-ended carinate scraper.

11. About forty-eight miles south of Atbara with graves at foot of hill, Mile 381, March 16, 1948:

Stone poulder.

Quartz and rhyolite flakes.

Two shards of thick ware.

12. Meroë.¹⁷ Type locality. A series of shards was collected.¹⁸

13. Twenty miles south of Meroë on Atbara-Khartoum road. March 17, 1948:

Three quartz points, one badly rolled, and one flake.

Two flint flakes.

Two shards.

14. About twenty-five miles south of Meroë on Atbara-Khartoum road:

One rolled quartz point with apex missing, one small flake.

15. Thirty-five miles south of Meroë above Shendi, March 17, 1948:

2" yellow flake struck from a nodule showing clear bulb of percussion.

16. Twenty-two specimens were collected from the surface of the Nubian Desert as representatives of aeolian action including wind etching and dreikanter.

17. Kereri (Keren) Village, fifteen miles north of Omdurman on the road to Wadi Saidna, March 19, 1948. With Mr. and Mrs. P. L. Shinnie and Ibrahim, the Gufti. Neolithic "gouge-culture" station with one gouge (2") showing traces of polishing, rubbing stones, pounders, and shards with many incised designs.

THE PHYSICAL ANTHROPOLOGY OF FOUR GROUPS

Little anthropometric work has been done in the area between Wadi Halfa and Khartoum.

Mohammed Mitwally, Professor at Farouk I University in Alexandria, during 1947 obtained anthropometric data on individuals in the following groups: Shaigia near Kareima, Merowe (ancient Napata), and Tangasi; Danagla near Dongola; Bedeiriyah at Khundag; Mahas at Abri; and Barabra near Wadi Halfa.

Groups Studied during March, 1948

I measured in the limited time at my disposal four small groups:

(a) At Abka, ten miles south of Wadi Halfa, 26 Nubians.

(b) At Abu Hamed, 38 Rubatab.

(c) At Abu Hamed, 4 Bisharin.

(d) At Umm Disa, eight miles south of Khartoum, 39 Gumueya tribesmen.

Since these groups were so small, no valid statistical conclusions may be drawn. However, the trends are clear for groups a, b, and d.

THE^o NUBIANS OF ABKA

On March 5-6, 1948, Keith Marker and I visited Abka, ten miles south of Wadi Halfa near the Nile Second Cataract. Twenty-six adult males were measured and observed.

Historical Notes. -- In the north are the Nuba (Nubiin), and in the southwest the Nubians of the Nuba Mountains. In the center live Arabs: Jaalin, Shaigia, Gerarshin, Shukniya, El Ababda, Habbaniya, Joamah, Hammar, El Hassaniya, El Batahin, and El Kababish. This area was called Fung after King Fung of Sennar, by the Nuba before it became Sudan.

South of Wadi Halfa on an island in the Nile live the Magyarnarti, Magyars from Hungary. At Abka they agreed that these could be recognized easily both by appearance and naturally by language.

The area from Wadi Halfa to Dongola was called orig-

inally Dughama by the Nuba, and from Dongola south, El Fung.

Population. -- These people are Nuba and, according to Sheikh Ahmed, are distantly related to the people of the Nuba Mountains, southwest of Khartoum. These Nuba speak Arabic as well as their own language. The Nuba range from Korusco, south of Shellal, to Abu Fatna. Abka is in an Omudiya (under an Omda) with Gemai in the Markaz Wadi Halfa. Abka has a population of 1,300 persons. They own camels, donkeys, cattle and sheep. The wasm of the Nuba in this Omudiya is \vee on the right cheek with / on the right thigh.

For each village there is a Sheikh and an Omda, but Sheikh Ali Sulaiman is also Omda of Abka, Gemai, and Murshid. At Gemai there are Sheikhs Mahir Abdul Majid and Ibrahim Osman; at Murshid, Sheikhs Osman Mohammed and Mohammed Saleh Mohammed; at Abka, Sheikhs Ahmed Mohammed Khabil and Said Ahmed Mohammed Saleh.

Tattooing. -- None among Nuba.

Kawi. -- Cauterization, usually to relieve localized pain, is called kawi.

Fisada. -- Many Nuba have cuts or scarification scars on the cheeks or temples.

Flora. -- The white male inflorescence of the date palm is cut and placed in the female palm by hand. The names in Arabic and Nubian are A. dakhr el-nakh and N. adam. The brown fruit (dom) contains a shield (A. kar-kura; N. ambingode) and inside a gray core (A. baoya; N. gode) which is made into buttons at Atbara, the only factory in the Sudan.

Fauna. -- Many scorpions at Abka and district. One man died three months before our arrival from a yellow scorpion's bite. Treatment: Make incision at once and suck out poison. Apply tourniquet. Drink bitter lemon juice, later hot water. Place affected part in hot sand and cover over for some time. Then drink sugarless tea. For two or three days the throat remains swollen and often the teeth set as in lockjaw. In the latter case use forcible feeding. Estimate given: one patient out of 200 dies from bite.

No poisonous snakes are believed in this area although reported from the mountains in the desert away from the Nile.

On Abka Island (Abkanarti) is a fish trap (A. sharak; N. kawar). When the Nile floods, the water comes down

this stream, pours through the doorway, and the fish are driven into the trap by two men who close the entrance and drive the fish to the end. The stone walls, forming the trap, are about four feet high.

STATISTICAL DATA ON NUBIANS OF ABKA

On March 5-6, 1948, twenty-six fellahin were measured at Abka, ten miles south of Wadi Halfa. Keith Marker acted as recorder and photographer.

Birthplace. -- All were born at Abka, as were both parents.

Age. -- The average age for the twenty-six Nubians was 39.10 years (range 20-75), half the group being under thirty-five years of age. It was almost impossible to persuade the older men to submit to the measurements.

AGE DISTRIBUTION

Age	No.	Per cent	Age	No.	Per cent
20-24.....	5	19.23	50-54.....	0	.....
25-29.....	2	7.69	55-59.....	1	3.85
30-34.....	6	23.08	60-64.....	2	7.69
35-39.....	0	.....	75-79.....	1	3.85
40-44.....	4	15.38			
45-49.....	5	19.23			

MORPHOLOGICAL CHARACTERS OF NUBIANS OF ABKA

Skin. -- The average Nubian skin was medium brown with a few darker individuals. Constant exposure to the weather and the tanning effect of the sun tended to give the middle-aged and older men a weather-beaten appearance. The secondary shadings of different parts of the body were in no way peculiar, but the regularly covered portions were markedly lighter. In a few cases the cranium, which always remains covered, was lighter than the average southern European; however, the majority had swarthy or darker complexions.

The skin color of the forehead was recorded as follows: swarthy (15), reddish brown (1), medium brown (6), chocolate brown (4), and dark brown (1). The color of the inner arm varied but little: swarthy (15), medium brown (5), chocolate brown (5), and dark brown (2). No. 15 was Negroid. No. 16 had chocolate-colored hands with whitish palms.

Freckles. -- Six men had some freckles, the rest none.
 Moles. -- Nine men had facial moles.

Hair. -- The hair of the head, beard, or mustache was dark brown except for the four older men with white hair. The texture was medium. In form, the hair showed considerable variation, the largest group being in the deep-wavy category. The four men with curly or frizzly hair indicated a Negroid element in the population. Head-hair quantity was recorded as follows: some (1), average (15), and double plus (6). Eighteen men showed no traces of baldness; however, three showed some, two plus, and one double plus. Body hair was absent on the chest in twenty cases, five men having some hair, with only one in the double-plus category. Fourteen men had no gray hair, eight had some, two had considerable; one had white hair. In the beard, fifteen men showed no indications of grayness, seven had some, two considerable; one man had a white beard.

HAIR

Color	No.	Per cent
Black.....	1	4.00
Dark brown.....	20	80.00
White.....	4	16.00
Total.....	25	100.00

Form	No.	Per cent	Texture	No.	Per cent
Straight.....	0	.....	Coarse....	3	15.00
Low waves....	7	35.00	Medium....	15	75.00
Deep waves...	9	45.00	Fine.....	2	10.00
Curly.....	3	15.00			
Frizzly.....	1	5.00	Total....	20	100.00
Total.....	20	100.00			

Eyes. -- The eyes were dark brown, with only one in the light-brown category. The majority of the irises were clear. The general condition of the eyes was far better than the lower Nile Valley, few cases of inflammation being observed. Even among the fifty children there were relatively few cases of eye trouble; in March, when we were at Abka, flies were relatively rare.

The following notes were recorded on four men: right eye poor, left eye blind; blue-ringed sclera; and two small cataracts in the left eye.

EYES

Color	No.	Per cent	Iris	No.	Per cent
Black.....	0	.....	Clear.....	21	80.77
Dark brown..	25	96.15	Rayed.....	0	.....
Light brown.	<u>1</u>	<u>3.85</u>	Zoned.....	3	11.54
			Spotted....	<u>2</u>	<u>7.69</u>
Total....	26	100.00	Total....	26	100.00

Eyebrow Concurrence. -- Eleven men had none, seven some, and seven average.

Browridges. -- The majority (24) possessed average, only two being in the slightly lower category.

Nose. -- The nasal profile showed remarkable variation, the highest percentage being concave. The nasal wings were average; but there was considerable divergence, with four compressed and seven in the slightly flaring group, again indicating a Negroid element. Fifteen men had thin nasal tips, ten were average, and one was recorded as double plus.

NOSE

Profile	No.	Per cent
Wavy.....	4	15.38
Concave.....	12	46.15
Straight.....	4	15.38
Convex.....	6	23.08
Concavo-convex.....	<u>0</u>	<u>.....</u>
Total.....	26	99.99

Wings	No.	Per cent
Compressed.....	4	15.38
Medium.....	15	57.69
Flaring.....	<u>7</u>	<u>26.92</u>
Total.....	26	99.99

Mouth. -- The lips were average in thickness, with one man possessing extra thin lips and two in the double-plus group. In each of ten cases the lower lip was everted or markedly everted.

Teeth. -- Eruption was complete in twenty-one men and incomplete in two cases. The occlusion was normal in three-quarters of the group, the remainder possessing marked overbite. Fifteen men had lost some teeth, but only four were in the highest category. The wear was either very little or considerable, possibly the result of a dietary change among the older men. For example, a marked increase in the drinking of very sweet tea is correlated with advancing age during the interminable hours of the discussion of tribal affairs. Two men had very large teeth, three had widely spaced front teeth. Five men had white and regular teeth in excellent condition. No crowding was recorded.

TEETH

Wear	No.	Per cent
Slight.....	14	53.85
Plus.....	1	3.85
Double or triple plus.....	<u>11</u>	<u>42.31</u>
Total.....	26	100.01

Bite	No.	Per cent	Loss	No.	Per cent
Under.....	0	.....	None.....	4	15.38
Edge-to-edge..	0	.....	Few.....	15	57.69
Slight over...	16	76.19	Some.....	3	11.54
Marked over...	<u>5</u>	<u>23.81</u>	Double plus	<u>4</u>	<u>15.38</u>
Total....	21	100.00	Total...	26	99.99

Ears. -- The left lobe was attached in every case except for one man whose lobe was soldered. The size of the left ear was average in sixteen cases, six were larger, and three were smaller. One man had very small ears. Ear protrusion was normal in eighteen tribesmen, but four were in the double-plus category and two in the triple-plus group. Two Gumueya tribesmen had ears lying close to the head.

Musculature and Health. -- The men and boys in and around Abka had well-developed musculature and appeared to be in good health.

Cauterization. -- No. 22 had a scar on the back of the neck from an attempt to relieve pain. On his right cheek and right parietal two parallel cuts (singular, fisada) were visible; these had been made during adolescence to relieve pains.

Artificial Cranial Deformation. -- No. 3 had some deformation. According to local informants, this resulted from bandaging during childhood. However, his head length (188) and breadth (142) do not show any significant deviation from the average.

Disharmonic Face. -- No. 12 possessed a triangular face with a small, pointed chin and broad zygomatic arches.

Summary. -- On the basis of this small sample, the Nubians of Abka possess the following characters: medium-dark skin; dark brown hair with deep waves and medium texture; dark brown eyes with clear sclera; concave nose with medium alae; and good teeth with normal slight-over occlusion.

STATISTICAL ANALYSES OF NUBIANS

Stature. -- The majority were tall (170.0-179.9), the remainder being medium (160.0-169.9) in stature, with a mean of 171.36, which is considerably higher than the average for Southwestern Asia.

STATURE

<u>Harvard System</u>	<u>No.</u>	<u>Per cent</u>
Short (x-160.5).....	1	3.85
Medium (160.6-169.4).....	8	30.77
Tall (169.5-x).....	17	65.38
Total.....	26	100.00
<u>Keith System</u>	<u>No.</u>	<u>Per cent</u>
Short (x-159.9).....	0	.....
Medium (160.0-169.9).....	10	38.46
Tall (170.0-179.9).....	16	61.54
Very tall (180.0-x).....	0	.....
Total.....	26	100.00

Head Measurements. -- The head and forehead tended to be broad, with means of 142.12 and 116.26 respectively. The head was very long, with a range of 181-203 and a mean of 192.69. The cephalic index was 75.00, with the majority dolichocephalic and four men in the ultradolichocephalic (x-70.0) category.

MINIMUM FRONTAL DIAMETER

Group	No.	Per cent
Very narrow (x-99).....	0	.....
Narrow (100-109).....	2	7.69
Wide (110-119).....	17	65.38
Very wide (120-x).....	7	26.92
Total.....	26	99.99

HEAD BREADTH

Group	No.	Per cent
Very narrow (120-129).....	1	4.00
Narrow (130-139).....	5	20.00
Wide (140-149).....	18	72.00
Very wide (150-x).....	1	4.00
Total.....	25	100.00

CEPHALIC INDEX

Harvard System	No.	Per cent
Dolichocephalic (x-76.5).....	18	69.23
Mesocephalic (76.6-82.5).....	7	26.92
Brachycephalic (82.6-x).....	1	3.85
Total.....	26	100.00

Keith System	No.	Per cent
Ultradolichocephalic (x-70.0).....	4	15.38
Dolichocephalic (70.1-75.0).....	13	50.00
Mesocephalic (75.1-79.9).....	7	26.92
Brachycephalic (80.0-84.9).....	1	3.85
Ultrabrachycephalic (85.0-x).....	1	3.85
Total.....	26	100.00

Facial Measurements. -- Although the upper facial height was long or medium long, with a mean of 74.10, the total facial height tended to be medium long, with a mean of 122.60 and a corresponding leptoprosopic index of 90.85.

FACIAL MEASUREMENTS

Upper Facial Height	No.	Per cent
Short (x-63).....	0	.....
Medium short (64-69).....	4	15.38
Medium long (70-75).....	10	38.46
Long (76-x).....	<u>12</u>	<u>46.15</u>
Total.....	26	99.99

Total Facial Height	No.	Per cent
Short (x-109).....	1	3.85
Medium short (110-119).....	7	26.92
Medium long (120-129).....	15	57.69
Long (130-x).....	<u>3</u>	<u>11.54</u>
Total.....	26	100.00

TOTAL FACIAL INDEX

Group	No.	Per cent
Euryprosopic (x-84.5).....	3	11.54
Mesoprosopic (84.6-89.4).....	7	26.92
Leptoprosopic (89.5-x).....	<u>16</u>	<u>61.54</u>
Total.....	26	100.00

Nasal Measurements. -- The nose was medium long and medium wide to wide, with a mesorrhine index of 71.98.

NASAL MEASUREMENTS

Nasal Height	No.	Per cent
Short (x-49).....	1	3.85
Medium (50-59).....	20	76.92
Long (60-x).....	<u>5</u>	<u>19.23</u>
Total.....	26	100.00

NASAL MEASUREMENTS

Nasal Breadth	No.	Per cent
Very narrow (x-29).....	0	.....
Medium narrow (30-35).....	0	.....
Medium wide (36-41).....	19	73.08
Wide (42-x).....	7	<u>26.92</u>
Total.....	26	100.00

NASAL INDEX

Group	No.	Per cent
Leptorrhine (x-67.4).....	8	30.77
Mesorrhine (67.5-83.4).....	16	61.54
Platyrrhine (83.5-x).....	2	<u>7.69</u>
Total.....	26	100.00

The following tables have been added so that the percentages in each grouping may be compared to all Harvard series.

NUBIANS OF ARKA

Minimum Frontal Diameter

Head Breadth	x-99 No. %	100-109 No. %	110-119 No. %	120-x No. %	Totals No. %
120-129.....	0 0	1 4.17	0 0	0 0	1 4.17
130-139.....	0 0	0 0	5 20.83	0 0	5 20.83
140-149.....	0 0	1 4.17	12 50.00	4 16.67	17 70.83
150-x.....	0 0	0 0	0 0	1 4.17	1 4.17
Totals.....					24 100.00

Bizygomatic Breadth

Total Facial Length	x-124 No. %	125-134 No. %	135-x No. %	Totals No. %
x-114.....	0 0	1 3.85	0 0	1 3.85
115-124.....	0 0	7 26.92	10 38.46	17 65.38
125-x.....	0 0	2 7.69	6 23.08	8 30.77
Totals.....				26 100.00

Upper Facial Length

Total Facial Length	x-63 No. %	64-69 No. %	70-75 No. %	76-81 No. %	82-x No. %	Totals No. %
x-109.....	0 0	1 3.85	0 0	0 0	0 0	1 3.85
110-119.....	0 0	2 7.69	4 15.38	1 3.85	0 0	7 26.92
120-129.....	0 0	1 3.85	5 19.23	8 30.77	1 3.85	15 57.69
130-x.....	0 0	0 0	1 3.85	2 7.69	0 0	3 11.54
Totals.....						26 100.00

Nasal Breadth

Nasal Length	x-29 No. %	30-35 No. %	36-41 No. %	42-x No. %	Totals No. %
x-49.....	0 0	0 0	1 3.85	0 0	1 3.85
50-59.....	0 0	0 0	14 53.85	6 23.08	20 76.92
60-x.....	0 0	0 0	4 15.38	1 3.85	5 19.23
Totals.....					26 100.00

MEASUREMENTS AND INDICES OF NUBIANS OF ARKA

Measurements	No.	Range	Mean	S.D.	C.V.
Age.....	26	20-75	39.10 ± 1.88	14.15 ± 1.32	36.19 ± 3.39
Stature.....	26	160-179	171.36 ± .57	4.35 ± .40	2.54 ± .24
Head length.....	26	181-203	192.69 ± .84	6.39 ± .60	3.32 ± .31
Head breadth.....	25	127-157	142.12 ± .76	5.58 ± .53	3.93 ± .38
Minimum frontal diameter.....	25	109-123	116.26 ± .55	4.08 ± .39	3.51 ± .34
Bizygomatic diameter.....	26	125-146	135.45 ± .57	4.35 ± .40	3.21 ± .30
Bigonial diameter.....	26	100-124	114.10 ± .80	6.04 ± .57	5.29 ± .49
Total facial height.....	26	108-138	122.60 ± .84	6.35 ± .59	5.18 ± .49
Upper facial height.....	26	67-83	74.10 ± .52	3.95 ± .37	5.33 ± .50
Nasal height.....	26	35-66	56.42 ± .69	5.24 ± .49	9.29 ± .87
Nasal breadth.....	26	35-46	40.07 ± .39	2.97 ± .28	7.41 ± .69
Ear length.....	26	55-70	62.93 ± .47	3.54 ± .33	5.63 ± .53
Ear breadth.....	26	30-42	37.24 ± .41	3.09 ± .29	8.30 ± .78
Indices					
Cephalic.....	26	69-95	75.00 ± .70	5.31 ± .47	7.08 ± .66
Fronto-parietal.....	25	64-87	80.92 ± .61	4.53 ± .43	5.60 ± .53
Zygo-frontal.....	25	83-91	85.82 ± .30	2.24 ± .22	2.61 ± .25
Zygo-gonial.....	26	77-90	84.43 ± .46	3.48 ± .32	4.12 ± .38
Total facial.....	26	81-101	90.85 ± .67	5.05 ± .47	5.56 ± .52
Upper facial.....	26	48-66	54.74 ± .51	3.87 ± .36	7.07 ± .66
Nasal.....	26	55-103	71.98 ± 1.37	10.36 ± .96	14.39 ± 1.34
Ear.....	26	51-66	58.93 ± .50	3.84 ± .36	6.52 ± .60
Cephalo-facial.....	25	90-101	94.36 ± .43	3.18 ± .30	3.33 ± .32
Fronto-gonial.....	25	92-107	98.80 ± .57	4.20 ± .40	4.25 ± .40

SUMMARY

The means and groupings of the measurements show the average Nubian tribesman to be: tall or medium, with a broad head and forehead, dolichocephalic, long upper facial height and leptoprosopic, and medium long and wide nose with a mesorrhine index.

THE RUBATAB AT ABU HAMED

On March 11, 1948, we were received by Ali Omar el-Bashkir, Omda of Abu Hamed and Gezirat Mograt, the island across the Nile. The Omda was accompanied by Mohy el-Din Nuri, local schoolmaster, who spoke some English. Our five-day visit, with headquarters in the government rest house beside the Nile, was exceptionally pleasant and instructive.

History. -- The Omda and the schoolmaster supplied the following information. The Rubatab¹⁹ are descended from Abbas and consider themselves Quraish, having left Arabia about 1366. The Omda divided the Quraish into: Shaigia, Monassir, Rubatab, Ingriab, Mirafab, and Jaalin. When the Arabs conquered the Sudan, the Rubatab came to the Abu Hamed area and have remained ever since.

Population. -- According to the Omda, there were in 1948 about 1,100 inhabitants of Abu Hamed and about 11,000²⁰ on Gezirat Mograt. About 1820 the Rubatab were divided into Bedirab, with subtribes Batarin and El Naimab, and Ajibab, with subtribes El Hijula and Difab. The Bedirab and Ajibab each number about 1,000 persons. Now the main tribes of the Rubatab are the Batarin and El Hijula, since the El Naimab became part of the former and Difab of the latter. The Omda of the Batarin is Ali Omar el-Bashkir, our host, and of El Hijula Omda Selman Osman, who lives in Shareiq, the fourth railroad station south of Abu Hamed.

Language. -- All Rubatab speak Arabic.

Mograt Island.²¹ -- This consists of a plateau covered with gravel and surrounded by a strip of land of varying width, capable of cultivation. Along this lie many small villages or hamlets. On the southern and eastern coasts the villages are larger and more land is under cultivation. The island districts include the small islands coming within their limits and also land on both banks of the Nile.

The population is distributed as follows:

District	No.
Abu Sidir.....	500
Sihan.....	300
Megel.....	150
Siyel.....	400
Kela Saikal.....	300
Total.....	1,650

There are about eighty sagias on the island.

The crops include dura owega (millet), barley, beans, and a few fresh vegetables. There are about 200 donkeys, a few camels, cows and oxen (for turning the sagias), goats, and sheep.

Salt is manufactured at Kuss. The finished two-pound blocks of salt are exchanged for an equivalent weight of grain.

In the district of Sihan are large granite boulders on which are many crude pictures of animals, cows, stags, hippopotami, and, in one example, people. These drawings seem to have been made at two different dates; in most cases the more recent appear to be copies of the ancient. Among the newer drawings are many crosses and Arabic sentences relating to Mohammed. At El Kueb, on the right bank of the Nile and nearly opposite Sihan, are some curiously formed boulders into which mud and stones have been built. The interiors of these ruins are full of fragments of old pottery, which also cover the desert for some distance. The traces of a stone wall from these boulders to the river are visible, as are those of a large rectangular enclosure to the east of the boulders. Ruined forts on the island were built of loose stones and mud. They are square (fifty meters) with semicircular caponiers or towers at the corners.

Flora. -- From Kaheila to Karaba the Rubatab devote considerable attention to date cultivation. Samples of the following specimens were purchased in the market (suq) at Abu Hamed:

Arabic	English
Hunta, locally Qamah.....	Wheat
Dura beledi.....	Millet
Lubia afin or Gussil.....	Beans
Turmus.....	Lupin (?)
Lubia helu.....	Beans
Dukhn.....	Millet
Shair.....	Barley

Dates form an important crop in the Abu Hamed area. Several varieties, in order of quality, are grown: Mishriq Wad Laggai, Wad Khatib, Abdu el-Rahim, and Jau. Other varieties include: Gundela, Tamoda, Gergoda, Berticoli, Wadebshaar, Bur, Saflawi, Unfuseyir, El Hamra, Geduriya, Umm Shaaf, Umm Begira, Tamr ta Haj, and Birera.

Fauna. -- A large hippopotamus had been shot in the river a few days before our arrival. The skull was lying outside the police post. Long strips of the thick hide were salted and drying in the sun near the market place. The general name for hippopotamus is farus el-Bahr (river horse), but in Abu Hamed it is also called gerinti or asitt. These animals are rare in the Abu Hamed area, the last one being shot in 1942. The skulls are dried and placed as ornaments on top of the mud hut used as the police post.

RUBATAB MEASURED AT ABU HAMED

Thirty-eight members of the Rubatab tribe were measured and studied at Abu Hamed on March 13, 1948. Keith Marker acted as recorder.

Birthplaces. -- Each Rubatabi measured was selected on the basis of having been born of Rubatab parents in Abu Hamed.

Vital Statistics. -- The Omda and schoolmaster considered it inadvisable to request this information.

Age. -- The average age was 29.50 (range 18-45). Sixty per cent of the group were under thirty years of age.

AGE DISTRIBUTION

Age	No.	Per cent
18-19.....	4	10.53
20-24.....	9	23.68
25-29.....	10	26.32
30-34.....	3	7.89
35-39.....	6	15.79
40-44.....	3	7.89
45-49.....	3	7.89
Total.....	38	99.99

MORPHOLOGICAL CHARACTERS OF RUBATAB

Skin. -- The color was lighter than the average Nubian of Abka. Individually it ranged from that of a typical southern European to dark brown. The skin color of the forehead was grouped into brunet (2), swarthy (15), medium brown (1), chocolate (11), and dark brown (9). The skin color of the inner arm was divided into brunet (3), swarthy (15), medium brown (1), chocolate (11), and dark brown (9). Five men had some Negroid blood.

Freckles. -- No. 38 had many freckles.

Moles. -- Fourteen men had a few, and No. 62 had many.

Hair. -- The hair of the head, beard, and mustache was divided almost evenly between being black or dark brown. It is probable that the Rubatab possessed very dark brown, rather than black, hair. No trace of submerged blondism was present. There was considerable variation in hair form, the majority being either deep wavy or curly. The three men with frizzly hair indicated Negroid blood. The majority of the Rubatab possessed hair of medium texture.

The quantity of head hair was grouped into average (34) and double plus (4). Twenty-seven men showed no trace of baldness, ten showed some, and one was in the plus category. In beard quantity, six men had slight, sixteen some, and sixteen average light beards. Only one man in the group had a little chest hair. Grayness of head hair was absent in twenty-five cases, thirteen had some, and one man was in the double-plus group. Beard grayness was absent in twenty-four Rubatab, but thirteen had some gray hairs.

HAIR

Color	No.	Per cent
Black.....	19	51.35
Dark brown.....	18	48.65

Total..... 37 100.00

Form	No.	Per cent
Straight.....	0	.....
Low waves.....	5	16.13
Deep waves.....	11	35.48
Curly.....	12	38.71
Frizzly.....	3	9.68

Total..... 31 100.00

Texture	No.	Per cent
Coarse.....	5	16.13
Medium.....	20	64.52
Fine.....	6	19.35

Total..... 31 100.00

Eyes. -- The entire group had dark brown eyes. The majority (35) had clear irises. Vision was from fair to good. No. 68 had a white patch on the inner side of the right eye. No. 51 had poor vision. No. 61 had bloodshot eyes.

EYES

Color	No.	Per cent	Iris	No.	Per cent
Black.....	0	.....	Clear....	35	92.11
Dark brown...	38	100.00	Rayed....	0	.....
			Zoned....	2	5.26
Total.....	38	100.00	Spotted..	1	2.63

Total.. 38 100.00

Eyebrow Concurrence. -- Nineteen men were average, thirteen were small, and six were in the double-plus category.

Browridges. -- Thirty-four men were average, and two slightly less than average.

Nose. -- The majority were concave, although there was considerable variation. The nasal wings were medium, but one-quarter of the Rubatab possessed slightly flaring alae.

NOSE

Profile	No.	Per cent
Wavy.....	4	10.53
Concave.....	21	55.26
Straight.....	7	18.42
Convex.....	6	15.79
Concavo-convex.....	<u>0</u>	<u>.....</u>
Total.....	38	100.00

Wings	No.	Per cent
Compressed.....	3	7.89
Medium.....	24	63.16
Medium-flaring.....	0	.....
Flaring.....	<u>11</u>	<u>28.95</u>
Total.....	38	100.00

Nasal Tip. -- Twenty-two men were average, fourteen were smaller, one was double plus, and one was in the triple-plus category.

Mouth. -- The integumental thickness of the lips was average in thirty-six cases, the remaining two being in the double-plus category. The lower lip eversion tended to be marked.

Teeth. -- Eruption was recorded as complete in eighteen men and partly complete in seven. Crowding was absent in thirty-three cases and double plus in three men. In one individual the front teeth were widely spaced. Six men had excellent, regular white teeth. The occlusion was normal in the majority of the Rubatab tribesmen, but one-third were into the marked-over category. Little wear was observed on twenty-six men, but nine showed marked wear. Only eleven had lost no teeth; the majority had lost a few.

TEETH

Bite	No.	Per cent
Under.....	0	.....
Edge-to-edge.....	1	2.70
Slight over.....	23	62.16
Marked over.....	<u>13</u>	<u>35.14</u>
Total.....	37	100.00

Wear	No.	Per cent
Slight.....	26	70.27
Plus.....	2	5.41
Double or triple plus.....	<u>9</u>	<u>24.32</u>
Total.....	37	100.00

Loss	No.	Per cent
None.....	11	29.73
Few.....	20	54.05
Some.....	5	13.51
Plus.....	<u>1</u>	<u>2.70</u>
Total.....	37	99.99

Musculature and Health. -- The Rubatab have well-developed musculature, and those examined seemed in good health. Dr. Julius M. Amberson and Dr. Trenton K. Ruebush examined and X-rayed about a hundred villagers who complained of sickness. There were several neurotics who appeared to be in good health but were worrying about future illness. The fear of poor health and pain seemed to concern many of the dwellers in Abu Hamed. This is the first time that I have come across this type of group neurosis in either Southwestern Asia or north-east Africa.

Ears. -- The left lobe was attached in thirty-six men, soldered in two cases. The ear size was average in twenty-nine Rubatab, with four men in each of the small and double-plus categories. One man had a very small ear. Protrusion was normal in twenty-nine men, double plus in eight, with only one in the small category.

Summary. -- The average Rubatab tribesman possessed swarthy or even darker skin on the exposed surfaces and dark brown or very dark brown (? black) curly or deep-

wavy hair of medium texture. The eyes were uniformly dark brown, the irises being clear. The nasal profile showed great divergence, the majority being concave with medium to flaring alae. The lips were thicker than those of the average European. The musculature, health, and teeth were good.

STATISTICAL ANALYSES OF RUBATAB

Stature. -- Half the group were medium (160.0-169.9), with one-third in the tall (170.0-179.9) category. The mean was 167.49, which is slightly higher than that of the peoples of Southwestern Asia and lower than that of the Nubians of Abka (171.36).

STATURE

Harvard System	No.	Per cent
Short (x-160.5).....	4	11.11
Medium (160.6-169.4).....	18	50.00
Tall (169.5-x).....	<u>14</u>	<u>38.89</u>
Total.....	36	100.00

Keith System	No.	Per cent
Short (x-159.9).....	3	8.33
Medium (160.0-169.9).....	20	55.56
Tall (170.0-179.9).....	12	33.33
Very tall (180.0-x).....	<u>1</u>	<u>2.78</u>
Total.....	36	100.00

Minimum Frontal Diameter. -- The forehead tended to be wide or very wide, with a mean of 115.02.

MINIMUM FRONTAL DIAMETER

Group	No.	Per cent
Very narrow (x-99).....	0	.....
Narrow (100-109).....	6	15.79
Wide (110-119).....	25	65.79
Very wide (120-x).....	<u>7</u>	<u>18.42</u>
Total.....	38	100.00

Head Breadth. -- The majority were wide, with a mean of 132.00.

HEAD BREADTH

Group	No.	Per cent
Very narrow (117-129).....	1	2.63
Narrow (130-139).....	6	15.79
Wide (140-149).....	27	71.05
Very wide (150-x).....	4	10.53
Total.....	38	100.00

Cephalic Index. -- According to the Harvard system, the majority were dolichocephalic. The Keith classificatory system places more than 90 per cent in the dolichocephalic and mesocephalic (x-79.9) categories.

CEPHALIC INDEX

Harvard System	No.	Per cent
Dolichocephalic (x-76.5).....	27	71.05
Mesocephalic (76.6-82.5).....	9	23.68
Brachycephalic (82.6-x).....	2	5.26
Total.....	38	99.99

Keith System	No.	Per cent
Ultradolichocephalic (x-70.0).....	3	7.89
Dolichocephalic (70.1-75.0).....	16	42.11
Mesocephalic (75.1-79.9).....	16	42.11
Brachycephalic (80.0-84.9).....	2	5.26
Ultrabrachycephalic (85.0-x).....	1	2.63
Total.....	38	100.00

Facial Measurements and Indices. -- The upper part of the face tended to be medium long or long, with almost half the group in the former (70-75) category. The mean was 73.60. The total facial length was medium long or medium short; but the remainder (18.42 per cent) were in the long (130-x) group, with a mean of 122.90. Three-quarters of the Rubatab were leptoprosopic, but two men were euryprosopic in spite of the fact that no individuals had short upper or total facial heights. No. 39 had a triangular face.

FACIAL MEASUREMENTS

Upper Facial Height	No.	Per cent
Short (x-63).....	0	.....
Medium short (64-69).....	8	21.05
Medium long (70-75).....	18	47.37
Long (76-x).....	<u>12</u>	<u>31.58</u>
Total.....	38	100.00

Total Facial Height	No.	Per cent
Short (x-109).....	0	.....
Medium short (110-119).....	15	39.47
Medium long (120-129).....	16	42.11
Long (130-x).....	<u>7</u>	<u>18.42</u>
Total.....	38	100.00

TOTAL FACIAL INDEX

Group	No.	Per cent
Euryprosopic (x-84.5).....	2	5.26
Mesoprosopic (84.6-89.4).....	7	18.42
Leptoprosopic (89.5-x).....	<u>29</u>	<u>76.32</u>
Total.....	38	100.00

Nasal Measurements and Indices. -- The Rubatab tribesmen possessed noses medium or long, medium wide with leptorrhine or mesorrhine indexes. Two men were platyrrhine. The mean height was 60.22 (range 34-68), the breadth 37.91 (range 32-48), and the nasal index 67.70.

NASAL MEASUREMENTS

Nasal Height	No.	Per cent
Short (x-49).....	3	8.11
Medium (50-59).....	23	62.16
Long (60-x).....	<u>11</u>	<u>29.73</u>
Total.....	37	100.00

NASAL MEASUREMENTS

<u>Nasal Breadth</u>	<u>No.</u>	<u>Per cent</u>
Very narrow (x-29).....	0	.....
Medium narrow (30-35).....	6	16.22
Medium wide (36-41).....	25	67.57
Wide (42-x).....	<u>6</u>	<u>16.21</u>
Total.....	37	100.00

NASAL INDEX

<u>Group</u>	<u>No.</u>	<u>Per cent</u>
Leptorrhine (x-67.4).....	18	48.64
Mesorrhine (67.5-83.4).....	17	45.95
Platyrrhine (83.5-x).....	<u>2</u>	<u>5.41</u>
Total.....	37	100.00

For comparison with other groups calculated on the Harvard system, the following tables have been prepared.

RUBATAS OF ABU HAMED

Head Breadth	Minimum Frontal Diameter						Totals	
	x-99 No. %	100-109 No. %	110-119 No. %	120-x No. %			No.	%
120-129.....	0 0	0 0	0 0	0 0	0 0	0	0	0
130-139.....	0 0	2 5.41	3 8.11	1 2.70		6	16.22	
140-149.....	0 0	4 10.81	18 48.65	5 13.51		27	72.97	
150-x.....	0 0	0 0	4 10.81	0 0		4	10.81	
Totals.....						37	100.00	

Total Facial Length	Bizygomatic Breadth						Totals	
	x-124 No. %	125-134 No. %	135-x No. %				No.	%
x-114.....	1 2.63	1 2.63	0 0	2 5.26				
115-124.....	0 0	14 36.84	8 21.05	22 57.89				
125-x.....	1 2.63	8 21.05	5 13.16	14 36.84				
Totals.....				38	99.99			

Total Facial Length	Upper Facial Length						Totals	
	x-63 No. %	64-69 No. %	70-75 No. %	76-81 No. %	82-x No. %		No.	%
x-109.....	0 0	0 0	0 0	0 0	0 0	0	0	0
110-119.....	0 0	4 10.53	9 23.68	2 5.26	0 0	15	39.47	
120-129.....	0 0	4 10.53	5 13.16	6 15.79	1 2.63	16	42.11	
130-x.....	0 0	0 0	4 10.53	1 2.63	2 5.26	7	18.42	
Totals.....						38	100.00	

Nasal Length	Nasal Width						Totals	
	x-29 No. %	30-35 No. %	36-41 No. %	42-x No. %			No.	%
x-49.....	0 0	1 2.70	2 5.41	0 0	3 8.11			
50-59.....	0 0	3 8.11	15 40.54	5 13.51	23 62.16			
60-x.....	0 0	2 5.41	8 21.62	1 2.70	11 29.73			
Totals.....					37	100.00		

MEASUREMENTS AND INDICES OF RUBATAS OF ABU HAMED

Measurements	No.	Range	Mean	S. D.	C. V.
Age.....	38	18-45	29.50 ± 1.00	9.10 ± .70	30.85 ± 2.39
Stature.....	36	156-184	167.49 ± .65	5.76 ± .46	3.44 ± .28
Head length.....	37	176-203	191.04 ± .71	6.45 ± .51	3.38 ± .26
Head breadth.....	38	117-151	142.66 ± .61	5.52 ± .42	3.87 ± .30
Minimum frontal diameter.....	38	106-137	115.02 ± .71	6.52 ± .51	5.67 ± .65
Bizygomatic diameter.....	38	111-147	132.00 ± .62	5.65 ± .44	4.28 ± .33
Bigonial diameter.....	38	97-128	110.66 ± .69	6.36 ± .49	5.75 ± .45
Total facial height.....	38	111-141	122.90 ± .75	6.85 ± .53	5.57 ± .43
Upper facial height.....	38	64-83	73.60 ± .77	7.05 ± .55	9.58 ± .74
Nasal height.....	37	34-78	59.46 ± 1.01	9.08 ± .71	15.27 ± 1.20
Nasal breadth.....	37	32-48	38.00 ± .37	3.36 ± .26	8.84 ± .69
Ear length.....	38	32-70	58.95 ± .82	7.45 ± .57	12.64 ± .98
Ear breadth.....	38	28-43	35.33 ± .36	3.24 ± .25	9.17 ± .71
<u>Indices</u>					
Cephalic.....	38	70-84	75.41 ± .32	2.68 ± .22	3.82 ± .30
Fronto-parietal.....	38	75-117	80.83 ± .76	6.99 ± .54	8.65 ± .67
Zygo-frontal.....	38	78-109	87.18 ± .55	5.08 ± .39	5.83 ± .45
Zygo-gonial.....	38	76-102	84.04 ± .60	5.46 ± .42	6.50 ± .51
Total facial index.....	38	83-119	93.20 ± .69	6.35 ± .49	6.81 ± .53
Upper facial index.....	38	48-67	55.76 ± .47	4.26 ± .33	7.64 ± .59
Nasal.....	37	50-118	68.42 ± 1.20	10.84 ± .85	15.84 ± 1.24
Ear.....	38	45-125	61.45 ± 1.46	13.40 ± 1.04	21.80 ± 1.69
Cephalo-facial.....	38	80-108	92.87 ± .50	4.59 ± .36	4.94 ± .38
Fronto-gonial.....	38	69-107	95.70 ± .50	4.55 ± .35	4.75 ± .36

SUMMARY

Based on deductions from this small sample, the average Rubatab tribesman is medium to tall in stature and possesses a wide to very wide forehead, a wide head, dolichocephalic or mesocephalic index, medium long to long upper facial height, medium long or medium short total facial height with a leptoprosopic index, a nose medium or long, medium wide, and a leptorrhine or mesorrhine index.

BISHARIN OF ABU HAMED

During our short visit on March 11, 1948, I persuaded four Bisharin to be measured and studied. Keith Marker acted as recorder.

Birthplaces. -- All in the desert (gezira).

Parents. -- Both Bisharin.

Skin Color. -- The forehead and inner surface of the right arm were swarthy.

Freckles and Moles. -- None.

Hair. -- Low waves (2) or frizzly (2). Texture medium (3) and coarse (1). Quantity average (2), double plus (1), and triple plus (1). Baldness absent (3) and some (1). Beard quantity average (3) and slight (1). Body hair absent (1), some (2), and plus (1). Head grayness absent (3) and plus (1). Beard grayness absent (3) and plus (1). Head hair color black (1), dark brown (2), and white (1). Beard or mustache color black (1), dark brown (2), and white (1).

Eyes. -- Color dark brown (4). Iris clear (3) and zoned (1). No. 31, aged 65, was blind in the right eye and almost blind in the left eye.

Eyebrow Concurrence. -- Small (3) and very small (1).

Browridges. -- Average (4).

Nose. -- Nasal profile convex (3) and straight (1). Nasal tip thickness small (2) and average (2).

Mouth. -- Integumental thickness of lips average (3). Lower lip everted (3).

Teeth. -- Eruption complete (3). Occlusion slight-over (3) and marked-over (1). Teeth lost, none (2), some (1), and majority (1). Teeth wear, absent (3) and triple plus (1). Crowding absent (4). Nos. 29-30 had excellent regular white teeth.

Ear. -- Lobe attached (4). Ear size average (3) and double plus (1). Ear protrusion average (4).

MEASUREMENTS OF BISHARIN AT ABU HAMED

No.	Age	Stature	L	B	B'	J	Go-go
28	24	1740	188	133	108	127	108
29	21	1705	178	142	116	131	106
30	26	1720	184	143	113	128	109
31	65	1695	193	135	115	128	101

No.	GH	G'H	NH	NB
28	108	61	50	31
29	117	70	55	36
30	118	73	59	34
31	123	79	57	33

THE GUMUEYA OF UMM DISA

On March 19, 1948, Keith Marker, Ibrahim (the Gufti), and I drove to Umm Disa near El Rahawat about eight miles south across the plain to a group of trees near a reed-mat village. Here in the shade we measured, observed, and photographed the Gumueya (Gumeiya or Gamuia) tribesmen assembled by order of Paramount Sheikh Nasir el-Mek ibn Nasr. The two chief men of the Gumueya are: Omda Mohammed Ali Ahmed and Omda Babikir Sulaiman el-Mek of the Zanarka subtribe. The main tribal subdivisions, as given by Sheikh Nasir, are:

No.	Subtribe	Chief
1	Surnab.....	Omda Khalifa Ahmed Asad
2	Gezira Islan.....	Omda Hassan Ahmed Nasr
3	Kerer1.....	Asafi es-Sheikh Khujeli
4	El Faraghin.....	Mohammed Sulaiman el-Mek
5	El Fitehab.....	Babikir Sulaiman el-Mek
6	As Zanarkha.....	Ali Ahmed Mohammed
7	El Ghamarab.....	Idreis Ahmed ²²
8	Gumueya.....	El Mek Mohammed Nasr
9	El Muqdab.....	Idreis Ahmed

Genealogy of the Gumueya Kings. -- The following, which was obtained from Paramount Sheikh Mohammed Nasir el-Mek ibn Nasr, was translated in the Secretariat, Khartoum: "El Mek Mohammed son of El Mek Nasir son of

El Mek Ibrahim son of El Mek Babikir son of El Mek Sulaiman son of El Mek Nayil son of El Mek Hammad son of El Mek Nayil son of El Mek Hammad son of El Mek Ibrahim son of El Melek Gammoi the youngest son of El Melek Mansur son of El Melek Gammoi son of El Melek Qanim son of El Melek Himeidan son of El Melek Sobuh Abu Markha son of El Melek Sarrar son of Melek Kardum son of El Melek Abu El Deis son of Melek Abdullahi son of El Melek Ahmed El Yammani son of El Melek Ibrahim the so-called Gaal son of Idris son of Gais son of Yamman El Khazragi son of Qosas son of Kurb son of Hatil son of Yatil son of Thi El Kilab son of Saad El Unsari son of El Fadl son of Abullahi son of El Sayyid El Abbasi son of Abdel Montaleb son of Hashim -- all these are the honorable men of Quraish."

History.²³ -- The Gumueya, a tribe of Arab assent centered at Dugja-Fitihab near Omdurman, claim to be one of the Jaalin confederation of Arabs. They migrated south to their present headquarters from Jaalin near Shendi on the west bank of the Nile. During 1923 Ali Wad Nasr el-Mek succeeded his father as Paramount Chief and it is to him that we are indebted for the use of the tribal record on which the following history²⁴ of the Gumueya is based.

The Jaalin introduced Islam into the southern parts of Nubia and Kordofan and as far west as Timbuctu. This great westward migration commenced after the Abdellab submitted to the Fung (pronounced Funj) and endeavored to force all the other Arabs to do likewise. The Gumueya as a tribe would appear to have submitted to vassalage under a Negroid people such as the Fung.

Mek Rameidan was the first Mek to be recorded, but the date of his birth or death is not known. Until just before the Turkish invasion the leadership passed from father to son. Rameidan's rule was distinguished for his conquest of the Dar Hamid tribe and the loot he took from them, and his son Mek Ghanam continued the record of conquest by defeating the Gawasma tribe and also the Haddendoa, whose country was partially occupied by the Gumueya for three months during which period large quantities of cattle and slaves were abducted.

The next Mek, Gammu, sent his son Hamed, a famous warrior, to reduce the Hassania to submission and as a result annexed their country. One of the principal women of the Hassania married Hamed. In spite of Hamed's

success, Mek Gammu was succeeded by his son Mansur, who spent his life fighting the Shukria, claiming to have defeated them in numerous combats. Mansur's son Ibrahim collected taxes for the Fung throughout a large area. By this time the tribe had the privilege of possessing a copper tribal drum and their Mek was one of the wearers of the horned cap (tagia). Although the people between Kamlin and Ras revolted against Ibrahim's authority, he defeated them. Peace ensued during the long rule of his son Abu Hasis.

Abu Hasis was succeeded by Hamed Abu Gulug, who attacked the mountains of Abu Taba (Kordofan) and after a long siege defeated and enslaved the population. He then conquered Jebel Feraza. His successor, Mek Nail ibn Hamed, attacked the Hameg and marched on Sennar with a large army under Abu Rida Qamis. Mek Nail killed their leader in single combat. The Hameg fled. In 1150 A.H. (1737 A.D.) Nail, son of Hamed ibn Nail, became Paramount Chief. Although Nail was proficient in combat, defeating the Mohammedia and successfully attacking the Hassania and Hassanat tribes, his son Sulaiman, who succeeded him in 1171 A.H. is recorded as the greatest of the tribal warriors. Sulaiman's principal fights were for supremacy north of Halfaya, where the Abdellab viziers, resenting the growing power of the Gumueya, tried to collect taxes and rule both banks of the Nile and extend their influence into the west. During one of the fights with the Abdellab, Sheikh Nasr el-Amin tried to kill Mek Sulaiman, but died in the attempt.

Mek Sulaiman then drove the Shaigia into Mettemmeh and Shendi. A cousin of Sulaiman, Mek Abdel Aziz, penetrated into Dongola. He and his small band were killed by the Shaigia. Then Mek Sulaiman attacked and defeated the Shaigia.

Babikr, son of Mek Sulaiman, succeeded in 1199 A.H. He was attacked by the Abdellab but he defeated them and killed Mek Abdullah Wad Agib. Later a victory over the Kababish resulted in a coalition under Sultan Hashim, of the Musaabat, Kunjara, Fezara, Beni Gerar, and Homr tribes. The Kababish sought refuge with Mek Babikr. When the forces of Sultan Hashim followed them, the Kababish became dubious as to the protection of the Gumueya. When Mek Babikr heard of their lack of faith, he ordered all the Nile ferry boats to be burnt. He then ordered all the Gumueya and Kababish to wear green

turbans to distinguish them from the enemy. In order that his men should be on their mettle and resist to the death he also ordered 2,500 virgins to be tied, each to a warrior's camel. Thus the Gumueya advanced to the attack. At last the enemy broke and fled. Then the Kababish returned to their own country.

The next Mek was Idris el-Mehaina, son of Ahmed, a son of Mek Sulaiman and a nephew of Mek Babikr. During his rule the Turkish invasion took place. He raided the tribes between Managil and Messellemia, attacked the people at Om Dom near Soba, and later he attacked Eilafun and defeated a detachment of the Shukria under their leader, Tor Syeda, who was killed. These activities caused the Turks to give him some attention. He was attacked by four hundred Turkish cavalry while accompanied by fifteen mounted followers. Eight Gumueya were killed and Mek Mehaina attempted to escape, but was hit by a bullet after rallying his tribe. The wounded Mek gave his sword to his followers, who killed him to prevent the Turks taking him prisoner and probably mutilating him. At that time Ibrahim Wad Babikr played for the tribal rule by remaining neutral. As a reward he was appointed Tribal Sheikh and Nazir of the district. The time of Mek Mehaina's death was about 1240 A.H. (1824 A.D.), but Ibrahim Wad Babikr dates his accession as 1250 A.H. He was succeeded in 1296 A.H. by his son, Sulaiman el-Mek, who was in office at the outbreak of the Mahdia. With two hundred tribesmen, he left to join the garrison at El Obeid, where the tribal administration was handed over by him to his brother Nasr in 1899. Nasr later became one of the dervish Emirs and went with the army of Abu Anga to Abyssinia. In one of the encounters with the Abyssinians the old strain asserted itself and the Emir Nasr el-Mek (as he was then called) attacked and decapitated an Abyssinian chief in single combat.

Following the reoccupation of the Sudan by Kitchener's army the ex-Emir Nasr el-Mek was appointed tribal Nazir and he occupied this post until his death in 1923, at which time his son Ali Wad Nasr el-Mek succeeded him.

Habitat. -- Sheikh Nasr gave the range of the Gumueya from Wadi Seidna to El Mundara and from the Nile to Kordofan.

Population. -- The total number of the Gumueya was estimated at 47,000.

Migration. -- During April and May, when the rains

come and flood the Nile in the Umm Disa area, the Gumueya migrate for seven days by camel to El Indiraba, Shatut, Er Ribda, El Khabisa, Eid el-Khel, and Wadi Maqaddam, on the road to Bara and Soderi. In this district the Gumueya spend four or five months.

Fauna. -- Among animals seen near Umm Disa are foxes, striped hyenas, hares, bats, ducks, and geese. Gazelle and wolves are hunted in the hills.

GUMUEYA BEDUINS OF UMM DISA

On March 19, 1948, I measured thirty-nine Gumueya tribesmen at Umm Disa, eight miles south of Khartoum. Keith Marker acted as recorder.

Birthplaces. -- These tribesmen were of Gumueya parentage but declined to give their places of birth.

Vital Statistics. -- I was advised not to request these data.

Age. -- The average age for the group was 42.65, with a range of 18-80. The seriations show a wide distribution, with twelve men under 35 and eleven more than 50 years of age.

AGE DISTRIBUTION

Age	No.	Per cent	Age	No.	Per cent
18-19.....	2	5.13	50-54.....	4	10.26
20-24.....	5	12.82	55-59.....	1	2.56
25-29.....	3	7.69	60-64.....	1	2.56
30-34.....	2	5.13	65-69.....	0	.....
35-39.....	7	17.95	70-74.....	1	2.56
40-44.....	5	12.82	75-79.....	2	5.13
45-49.....	4	10.26	80-84.....	2	5.13
			Total....	39	100.00

MORPHOLOGICAL CHARACTERS OF GUMUEYA BEDUINS

Skin. -- In addition to the effect of climatic exposure and that of the intense rays of the sun during the summer months, evidence of Negroid blood was observed in ten individuals. Only two men were brunet; twenty-five were swarthy, nine were chocolate brown, and three dark brown. These colors of the skin were recorded on both the forehead and the inner surface of the right forearm.

Freckles. -- Thirty-five men had none, but one man had many.

Moles. -- Twenty-eight men had none, and seven had a few on the head or neck.

Hair. -- The hair of the head, beard, and mustache was dark brown merging into very dark brown or black. In form the hair had low waves and was medium in texture. Ten men were recorded as Negroid, hence the curly and frizzly hair on seven men.

HAIR

Color	No.	Per cent
Black.....	9	23.08
Dark brown.....	22	56.41
White.....	8	20.51

Total.....	39	100.00
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Form	No.	Per cent
Straight.....	0
Low waves.....	20	60.61
Deep waves.....	6	18.18
Curly.....	6	18.18
Frizzly.....	1	3.03

Total.....	33	100.00
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Texture	No.	Per cent
Coarse.....	4	12.12
Medium.....	28	84.85
Fine.....	1	3.03

Total.....	33	100.00
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Twenty-four men had an average amount of head hair, two had less than the average, and one had more. Twenty-four men showed no signs of baldness, twelve some, one considerable, and two were bald. Nineteen men had an average quantity of beard, eleven had some, five had considerable, and three had almost none.

Chest hair was not present on thirty-eight tribesmen, only one having a minute quantity.

Head grayness was absent in eleven men; a little was present in twenty cases, with seven in the plus and one

in the double-plus categories. Beard grayness was the same except that sixteen Gumueya Beduins showed some graying and fifteen none.

Eyes. -- The majority were dark brown with clear irises. The eyes -- or, more properly, the eye slits -- were horizontal as in Europeans. In general, the eyes were clear and the vision was keen as in most nomads of Southwestern Asia. However, seven men had poor vision.

EYES

Color	No.	Per cent	Iris	No.	Per cent
Black	0	.....	Clear.....	28	71.79
Dark brown...	34	87.18	Rayed.....	0	.....
Green-brown..	<u>5</u>	<u>12.82</u>	Zoned.....	11	28.21
			Spotted....	<u>0</u>	<u>.....</u>
Total.....	39	100.00			
			Total....	39	100.00

Eyebrow Concurrency. -- Nineteen were average, seventeen below average, and three above.

Browridges. -- Thirty-six were small, one was almost absent, and two were average.

Nose. -- Although the majority were convex, there was considerable variation in nasal profile. The wings were compressed, but seven tribesmen possessed flaring alae. The nasal tip was average in seventeen cases, small in twenty-one, and one man was in the triple-plus category.

NOSE

Profile	No.	Per cent
Wavy.....	3	7.69
Concave.....	10	25.64
Straight.....	8	20.51
Convex.....	18	46.15
Concavo-convex.....	<u>0</u>	<u>.....</u>
Total.....	39	99.99
Wings	No.	Per cent
Compressed.....	5	12.82
Medium.....	27	69.23
Flaring.....	<u>7</u>	<u>17.95</u>
Total.....	39	100.00

Mouth. -- The majority of the lips were thicker than those of the average European, and there was considerable eversion of the lower lip. Twenty-nine Gumueya tribesmen had average integumental lip thickness, but ten were in the double-plus group. Twenty-four tribesmen had everted lower lips, and thirteen were in the triple-plus category.

Teeth. -- Eruption was complete in thirty-five cases, but in only three men was it incomplete. No crowding was recorded in thirty-five cases, but in three men there was crowding. No. 71 had widely spaced front teeth.

The occlusion was normal slight-over, but almost 40 per cent had marked over bite. The majority had lost no teeth and wear was unusually little. Eight men had regular, white good teeth, which one man said was the direct result of drinking much sheep's milk. No. 81 had yellowish-stained teeth. No. 79 had no teeth.

TEETH

<u>Bite</u>	<u>No.</u>	<u>Per cent</u>
Under.....	0	.....
Edge-to-edge.....	2	5.26
Slight over.....	21	55.26
Marked over.....	<u>15</u>	<u>39.47</u>
Total.....	38	99.99
<u>Wear</u>	<u>No.</u>	<u>Per cent</u>
Slight.....	28	77.78
Plus.....	3	8.33
Double or triple plus.....	<u>5</u>	<u>13.89</u>
Total.....	36	100.00
<u>Loss</u>	<u>No.</u>	<u>Per cent</u>
None.....	21	53.85
Few.....	16	41.03
Double plus.....	<u>2</u>	<u>5.13</u>
Total.....	39	100.01

Ears. -- The left ear was attached in thirty-two men and soldered in four. Nineteen men had average-sized ears, seven had larger, nine had smaller, and two had very small. Eighteen men had average protrusion; ten had double-plus and one triple-plus. On seven men, the ears were flush with the head.

Musculature and Health. -- The Gumueya Beduins examined and observed around their camp appeared to be wiry and in good health.

Negroid. -- Nos. 70, 83, 89, 91, 92, 95, 103, 104, 106, and 108 were recorded as possessing Negro blood.

Branding. -- One man had an H cut into the center of each cheek.

Summary. -- The average Gumueya tribesman had low-wavy hair, medium in texture and dark brown in color. The eyes were dark brown with clear sclera. The nose was convex with medium wings. The lips were thicker than those of the average European. The teeth, musculature, and health were good.

STATISTICAL ANALYSES OF GUMUEYA BEDUINS

Stature. -- The majority were tall, according to the Keith system, and medium or tall, according to the Harvard categories. The mean was 168.99, range 158.0-180.0.

STATURE

<u>Harvard System</u>	<u>No.</u>	<u>Per cent</u>
Short (x-160.5).....	2	5.13
Medium (160.6-169.4).....	17	43.59
Tall (169.5-x).....	<u>20</u>	<u>51.28</u>
Total.....	39	100.00
<u>Keith System</u>	<u>No.</u>	<u>Per cent</u>
Short (x-159.9).....	1	2.56
Medium (160.0-169.9).....	20	51.28
Tall (170.0-179.9).....	17	43.59
Very tall (180.0-x).....	<u>1</u>	<u>2.56</u>
Total.....	39	99.99

Minimum Frontal Diameter. -- The forehead was wide or very wide, with a mean of 116.46, range 109-126.

MINIMUM FRONTAL DIAMETER

Group	No.	Per cent
Very narrow (x-99).....	0	.....
Narrow (100-109).....	1	2.56
Wide (110-119).....	29	74.36
Very wide (120-x).....	<u>9</u>	<u>23.08</u>
Total.....	39	100.00

Head Breadth. -- Most heads were wide, but one-quarter were narrow. The mean was 142.15, range 131-153. These figures reveal a certain disharmony when compared with the forehead width.

HEAD BREADTH

Group	No.	Per cent
Very narrow (120-129).....	0	.....
Narrow (130-139).....	10	25.64
Wide (140-149).....	27	69.23
Very wide (150-x).....	<u>2</u>	<u>5.13</u>
Total.....	39	100.00

Cephalic Index. -- According to the Harvard system, the majority were dolichocephalic with no brachycephals. The Keith classificatory system reveals that the Gumueya tribesmen were dolichocephalic with two ultradolichocephals and thirteen (33.33 per cent) mesocephals. The mean cephalic index was 74.37, range 68-82.

CEPHALIC INDEX

Harvard System	No.	Per cent
Dolichocephalic (x-76.5).....	28	71.79
Mesocephalic (76.6-82.5).....	11	28.21
Brachycephalic (82.6-x).....	<u>0</u>	<u>.....</u>
Total.....	39	100.00

CEPHALIC INDEX

Keith System	No.	Per cent
Ultradolichocephalic (x-70.0).....	2	5.13
Dolichocephalic (70.1-75.0).....	23	58.97
Mesocephalic (75.1-79.9).....	13	33.33
Brachycephalic (80.0-84.9).....	1	2.56
Ultrabrachycephalic (85.0-x).....	<u>0</u>	<u>.....</u>
Total.....	39	99.99

Facial Measurements. -- The upper part of the face tended to be medium long or long. There is considerable variation in this measurement: the mean was 70.85, range 60-84. The total facial height was medium short or medium long, with no individuals in the short category. The mean was 120.45, range 113-136. The groupings of the total facial indices places more than half the group in the leptoprosopic category and one-third in the mesoprosopic. The mean was 90.38, range 82-100.

FACIAL MEASUREMENTS

Upper Facial Height	No.	Per cent
Short (x-63).....	5	12.82
Medium short (64-69).....	10	25.64
Medium long (70-75).....	16	41.03
Long (76-x).....	<u>8</u>	<u>20.51</u>
Total.....	39	100.00

Total Facial Height	No.	Per cent
Short (x-109).....	0	.....
Medium short (110-119).....	18	46.15
Medium long (120-129).....	17	43.59
Long (130-x).....	<u>4</u>	<u>10.26</u>
Total.....	39	100.00

TOTAL FACIAL INDEX

Group	No.	Per cent
Euryprosopic (x-84.5).....	3	7.69
Mesoprosopic (84.6-89.4).....	14	35.90
Leptoprosopic (89.5-x).....	<u>22</u>	<u>56.41</u>
Total.....	39	100.00

Nasal Measurements and Indices. -- The Gumueya tribesmen possessed noses medium in length, medium in width, and with a leptorrhine or mesorrhine index. Four men were in the platyrrhine category. The mean height was 55.66 (range 36-75), the breadth 38.69 (range 34-45), and the nasal index 70.62 (range 48-88).

NASAL MEASUREMENTS

Nasal Height	No.	Per cent
Short (x-49).....	5	12.82
Medium (50-59).....	27	69.23
Long (60-x).....	<u>7</u>	<u>17.95</u>
Total.....	39	100.00

Nasal Breadth	No.	Per cent
Very narrow (x-29).....	0	.....
Medium narrow (30-35).....	3	7.69
Medium wide (36-41).....	30	76.92
Wide (42-x).....	<u>6</u>	<u>15.38</u>
Total.....	39	99.99

NASAL INDEX

Group	No.	Per cent
Leptorrhine (x-67.4).....	18	46.15
Mesorrhine (67.5-83.4).....	17	43.59
Platyrrhine (83.5-x).....	<u>4</u>	<u>10.26</u>
Total.....	39	100.00

GUMUEYA BEDUINS NEAR KHARTOUM

Minimum Frontal Diameter

Head Breadth	x-99		100-109		110-119		120-x		Totals	
	No.	%	No.	%	No.	%	No.	%	No.	%
120-129.....	0	0	0	0	0	0	0	0	0	0
130-139.....	0	0	0	0	10	25.64	0	0	10	25.64
140-149.....	0	0	1	2.56	19	48.72	7	17.95	27	69.23
150-x.....	0	0	0	0	0	0	2	5.13	2	5.13
Totals.....									39	100.00

Bizygomatic Breadth

Total Facial Length	x-124		125-134		135-x		Totals	
	No.	%	No.	%	No.	%	No.	%
x-114.....	0	0	4	10.26	1	2.56	5	12.82
115-124.....	0	0	15	38.46	13	33.33	28	71.79
125-x.....	0	0	2	5.13	4	10.26	6	15.38
Totals.....							39	99.99

Upper Facial Length

Total Facial Length	x-63		64-69		70-75		76-81		82-x		Totals	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
x-109.....	0	0	0	0	0	0	0	0	0	0	0	0
110-119.....	5	12.82	7	17.95	5	12.82	1	2.56	0	0	18	46.15
120-129.....	0	0	3	7.69	9	23.08	4	10.26	1	2.56	17	43.59
130-x.....	0	0	0	0	2	5.13	2	5.13	0	0	4	10.26
Totals.....											39	100.00

Nasal Width

Nasal Length	x-29		30-35		36-41		42-x		Totals	
	No.	%	No.	%	No.	%	No.	%	No.	%
x-49.....	0	0	0	0	4	10.26	1	2.56	5	12.82
50-59.....	0	0	2	5.13	20	51.28	5	12.82	27	69.23
60-x.....	0	0	1	2.56	6	15.38	0	0	7	17.95
Totals.....									39	100.00

MEASUREMENTS AND INDICES OF GUMUEYA BEDUINS NEAR KHARTOUM

Measurements	No.	Range	Mean	S. D.	C. V.
Age.....	39	18-80	42.65 ± 1.89	17.50 ± 1.34	41.03 ± 3.16
Stature.....	39	158-180	168.99 ± .56	5.19 ± .40	3.07 ± .24
Head length.....	39	180-203	191.46 ± .59	5.43 ± .42	2.84 ± .22
Head breadth.....	39	131-153	142.15 ± .54	5.01 ± .38	3.52 ± .27
Minimum frontal diameter.....	39	109-126	116.46 ± .45	4.20 ± .32	3.61 ± .28
Bizygomatic diameter.....	39	127-144	133.90 ± .54	5.00 ± .38	3.73 ± .29
Bigonial diameter.....	39	98-122	109.74 ± .56	5.16 ± .40	4.70 ± .36
Total facial height.....	39	113-136	120.45 ± .61	5.70 ± .44	4.73 ± .36
Upper facial height.....	39	60-84	70.85 ± .55	5.15 ± .40	7.27 ± .56
Nasal height.....	39	36-75	55.66 ± .67	6.16 ± .47	11.07 ± .85
Nasal breadth.....	39	34-45	38.69 ± .32	2.91 ± .22	7.52 ± .58
Ear length.....	39	36-77	62.50 ± .80	7.40 ± .57	11.84 ± .91
Ear breadth.....	39	29-43	35.69 ± .39	3.63 ± .28	10.17 ± .78
Indices					
Cephalic.....	39	68-82	74.37 ± .31	2.88 ± .22	3.87 ± .30
Fronto-parietal.....	39	75-90	81.55 ± .34	3.15 ± .24	3.86 ± .30
Zygo-frontal.....	39	81-91	86.62 ± .28	2.56 ± .20	2.96 ± .23
Zygo-gonial.....	39	75-92	81.76 ± .37	3.45 ± .26	4.22 ± .32
Total facial.....	39	82-100	90.38 ± .45	4.12 ± .32	4.56 ± .35
Upper facial.....	39	44-65	52.76 ± .51	4.71 ± .36	8.93 ± .69
Nasal.....	38	48-88	69.70 ± .99	9.04 ± .70	12.97 ± 1.01
Ear.....	39	46-89	59.30 ± .78	7.15 ± .55	12.06 ± .92
Cephalo-facial.....	39	88-100	94.22 ± .35	3.27 ± .25	3.47 ± .27
Fronto-gonial.....	39	86-108	94.70 ± .53	4.90 ± .38	5.17 ± .40

SUMMARY

The average Gumueya tribesman is medium to tall in stature, possesses a wide to very wide forehead, a wide to narrow head, dolichocephalic or mesocephalic index, medium long to long upper facial height, medium short or medium long total facial height with a leptoprosopic index, a nose medium in length, medium wide, and a leptorrhine or mesorrhine index.

APPENDIX A

ENGLISH-ARABIC-NUBIAN VOCABULARY

At Abka, ten miles south of Wadi Halfa, the following words and phrases were recorded phonetically on March 6, 1948, with the assistance of Keith Marker.

English	Arabic	Nubian
Barley.....	Shair.....	Sering
Beetle.....	Khunfus.....	Fudé
Camel.....	Jemel.....	Cam
Chameleon (green)....	Herboya.....	Dimmo
Cold.....	Barid.....	Orum
Come here.....	Tal hinna.....	Indokera
Crocodile.....	Timsah.....	Ulum
Date.....	Tamr.....	Fenti
Donkey.....	Hamar.....	Kadj
Dove.....	Gumri.....	Doghé
Fish.....	Semakh.....	Anghrissi
Gazelle.....	Ghrazal.....	Kitag
Go.....	Imshi.....	Nogé
Goat.....	Tor.....	Gurundi
Goat (milch).....	Buggar.....	Ti (plural, Tiguga)
Goodbye.....	Maasalaama.....	Afiyalagu
Hare.....	Arneb.....	Dunj
Horse.....	Hisn.....	Morti
How many?.....	Kam.....	Menkella
Hyena.....	Thubba.....	Adi
Jerboa.....	Jerboa.....	Jigger
Lizard ²⁵ (black).....	Arwal mal Jebel.....	Amenharkash
Money.....	Fluss.....	Shunger
No.....	La.....	Lala
Ram.....	Kharuf.....	Eged
Saturday.....	Sebet.....	Santé
Scorpion.....	Agrab.....	Seged
Sheep.....	Rennem.....	Urti (plural, Urtiguga)
Snake.....	Haya ²⁶	Uslangi
Sunday.....	Ahad.....	Kiraghé
Water.....	Moya.....	Aman
What is it?.....	Shinu hadha?.....	Menafirghi?
Wheat.....	Hunta.....	Ilé
Yes.....	Aiyawa.....	Aiyo

NUMERALS

English	Arabic	Nubian
1.....	Wahid.....	Wera
2.....	Ethnain.....	Uwoo
3.....	Thelatha.....	Tusco
4.....	Arba.....	Kamso
5.....	Khamseh.....	Dija
6.....	Sitta.....	Gorjo
7.....	Saba.....	Coloda
8.....	Thamanaya.....	Idwo
9.....	Tissa.....	Oscoda
10.....	Ashera.....	Dimi
11.....	Hidasha.....	Dimiwera
12.....	Ethnasha.....	Uwowera
20.....	Asherin.....	Arro
100.....	Mia.....	Imllera

NOTES

¹In this report I shall confine my observations to the anthropological and archaeological data, since the work of the U.S. Navy Medical Unit under Dr. Julius M. Amberson formed a separate series of studies. See also Field, 1949, especially n. 1.

²By the following dispatch, dated March 2 from Dakhla, Khartoum, to Discom, Wadi Halfa: "Dr. Henry Field of California University Expedition may measure and photograph racial types and also collect surface stone implements botanical and zoological specimens and buy ethnological objects AAA Please advise him to exercise tact over measuring and photographing types AAA Addsd. Discom Halfa repeated Governor Damer and Discoms Merowe Berber and Shendi."

³During 1947 Professor Mohammed Mitwally of Farouk I University, Alexandria, measured groups in the Dongola Reach of the Nile, about 200 miles south of Wadi Halfa. Mitwally joined the expedition in April in Kenya.

⁴So designated by A. J. Arkell.

⁵See also MacMichael, 1934 and 1935, especially bibliographical references; "The Sudan: a record of progress, 1898-1947"; "Sudan: Review of Commercial conditions," June, 1947, London; and "Report by the Governor-General," London, 1948.

⁶Through the kindness of Mr. Eric Penn, District Commissioner at Wadi Halfa, part of the files on the Northern Province to 1938 were placed at our disposal. Most of the data contained in chapter 11 have been selected from this reference material. The supplementary information not included here has been placed on Microfilm No. 3226, pp. 174-220, in the American Documentation Institute, 1719 N Street, N.W., Washington, D.C., where a copy may be purchased. The sections omitted here dealt with administration, lands, finance, economics and trade, communications, police and prisons, and religious groups -- all not directly pertinent to our anthropogeographical approach.

⁷See Dowson, 1948, pp. 112-113.

⁸In 1937 there were in the Halfa district 13 private pumps, 957 sagias, and 65 shadufs irrigating 9,562 feddans.

⁹See Dowson, 1948, pp. 112-113.

- ¹⁰ This lower figure was the result of a reduction in the rates in Dongola, Shendi, and Merowe districts following the report of the taxation committee.
- ¹¹ This was considered a poor year.
- ¹² Rotls per tree.
- ¹³ MacMichael, 1934, p. 4, writes that between Wadi Halfa and Khartoum the villagers are of mixed type, predominantly Nubian or Berberine, and Arab in Berber Province. All are Moslems.
- ¹⁴ Based on specimens in the Khartoum Museum and personal observations. See also Field, 1949.
- ¹⁵ Among other exhibits were quartz flakes from Heiban in the Nuba country, where they are still used for cicatrization, and a cast of the Bushman-like Singa Skull, which was found by W. R. Bond in 1924. This is a middle-aged male with a large supraorbital crest and corresponding sulcus. Above glabella a depression suggests a forceful blow. There are prominent parietal bosses with a flattening at bregma and a low head height. The original is in the British Museum.
- ¹⁶ Mr. Myers presented to the University of California a small representative series from Site CVII at Abka.
- ¹⁷ See Meroë by Garstang, 1909-1914. Temple of Amun. Baths and Temple of Aspert circa 590 B.C. and the Temple of the Sun mentioned by Herodotus. The cemetery of brick pyramids in the desert to the east, which was excavated by Reisner from 1920-1925, was dated by him 355-300 B.C.
- ¹⁸ Mr. Peter L. Shinnie, Commissioner for Archaeology, granted permission for this series to be shipped to the University of California.
- ¹⁹ The Rubatab form one of the principal Arab tribes of Berber, which include the Monassir, Ababda, Jaalin, Shaigia, Sowarab, Fadniya, and Hassania. See also Crowfoot, Huddleston, Lorimer, and Udal.
- ²⁰ This figure is far too high. Another source quoted later gives the population as 1,650, a more probable estimate.
- ²¹ The chief informant was Melek Farag Mohammed. These notes were made available by B. A. Lewis of the Secretariat, Khartoum.
- ²² Nos. 7 and 9 may be Idreis Ahmed or Ahmed Idreis. Our informants gave both variations.

²³ This section was excerpted from the Secretariat files in Khartoum through the kindness of Mr. B. A. Lewis.

²⁴ The origin of the tribe is given in detail by MacMichael, vol. 1, pp. 221 et seq., and therefore needs no elaboration here.

²⁵ Probably Uromastix sp.

²⁶ Locally Debib or Dabi.

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MAPS

1. Sudan. Scale 1:3,000,000. Prepared and published by A. Nichosoff, Alexandria.
2. The Anglo-Egyptian Sudan. Scale 1:3,000,000. Ordnance Survey Office, Southampton, 1928.
3. Tribal map of the Anglo-Egyptian Sudan. Scale 1:3,000,000. Ordnance Survey Office, Southampton, 1948.
4. Berber. Scale 1:500,000. Compiled, drawn, and printed by E. A. Survey Group, October 1, 1942.



PART FOUR

KENYA

The Kenya Section of the University of California African Expedition included Dr. H. B. S. Cooke, Dr. Robert H. Denison, Dr. P. E. P. Deraniyagala, Director of Colombo Museums, David Cohen, and T/S James L. Houle USMCR, in charge of transportation. This paleontological group was searching for Miocene apes in the Lodwar area near the southwestern corner of Lake Rudolf. Preliminary arrangements had been made for me to join them to conduct anthropometric studies on the Suk. However, after a conference with Sir Philip Mitchell, Governor of Kenya, I decided that since my time was limited I would attempt only some studies on the Masai. Sir Philip gave me every encouragement and facilitated the necessary arrangements to work both at Ngong and in the Masai Reserve.

Dr. L. S. B. Leakey, whom I had known since his undergraduate days at Cambridge University, and his talented wife Mary were kindness itself. Under their guidance I visited the Coryndon Memorial Museum, examined part of the study collections, worked in the library, and visited prehistoric obsidian mines and rockshelters near Lake Naivasha. Dr. Leakey drove me to Olduvai in Tanganyika so that I could examine the stratigraphical sections of this gorge. We also visited Olegorsallie, one of the famed "Museums-on-the-Spot." Dr. Leakey also assisted in the preparations for my work on the Masai. In the Coryndon Memorial Museum, Dr. Donald G. McInnes, A. Bogdan, and J. G. Williams were helpful in every way.

With introductions to Mr. Eric Sweatman, Officer-in-Charge of the Masai, from Mr. Thornely, Deputy Chief Secretary, and Mr. P. Wyn Harris of the Secretariat, my work was arranged to begin during a Saturday open-air market at Ngong, sixteen miles from Nairobi. Mr. Sweatman explained to the Masai headmen at the market the purpose of my curious behavior. With the aid of an interpreter I measured and observed twenty Masai and one aged Kikuyu, who insisted on being included in the series.

In Nairobi, Game Warden Captain Ritchie very kindly arranged for me to accompany Mr. J. A. Hunter, game

conservationist for the department, to Selengei in the Masai Reserve, thereby offering an opportunity to measure some Masai and see some game under expert guidance.

At Kajiado we stopped to request from the District Commissioner, Mr. G. C. M. Dowson, the assistance of an English-Masai interpreter to accompany us to Selengei for five days. Godfrey Njao, a schoolteacher in Kajiado with an excellent command of English and a deep interest in the history of his tribe, agreed to leave immediately for Selengei. This was indeed fortunate, for Godfrey persuaded the Masai, an unusually reluctant tribe, to submit to anthropometric measurements, observations, and photographs. In addition, we compiled the first detailed Masai-English vocabulary and phrases (see Appendix B). He proved to be a good companion and a tireless worker. Godfrey is now writing a history of the Masai based on oral tradition.

It was almost impossible to persuade the Masai in the Selengei-Mashuru area to submit to the calipers. Fortunately, when we returned to Kajiado to attend the cattle sale, I was able, with much local and tribal assistance, to record data on a good series, thus bringing the total up to 150 males.

Miss Theodore Sedgwick and Miss Emily C. Davis assisted in the preparation of the manuscript, especially on Appendix B. Dr. L. S. B. Leakey, Director of the Coryndon Memorial Museum, checked and corrected Appendix C.

During the latter part of April, Professor Mohammed Mitwally of Farouk I University, Alexandria, joined the expedition as physical anthropologist. On Zanzibar he recorded anthropometric data on about 200 adults of the Wahadimu, Watumbatu, Wapemba, and Shirazi tribes. Preliminary deductions indicate that these tribes are not pure Negroids, since considerable Asiatic influence from South Arabia, Persian Gulf, Iraq, and Iran is present in the modern population. Thus, "Zanzibar," which means "the land of the blacks," is a misnomer, although this might have been the case in early historical times.

No maps have been included, because the areas visited may be found readily on 1:1,000,000 maps. Because copies of the monograph by G. R. Sandford, "An Administrative and Political History of the Masai Reserve," are rare, the

complete text and maps have been placed on Microfilm No. 2942, pp. 1-239, in the American Documentation Institute, 1719 N Street, N.W., Washington 6, D.C., where a copy may be purchased.

In addition, the following have been placed on Microfilm No. 3226, pp. 310-373, in ADI:

No.	Title	Pages
1	<u>A Policy for the Administration of the Masai</u> by Eric Sweatman.....	5
2	<u>Trip to Olduwai Gorge, Tanganyika</u> by Henry Field and L. S. B. Leakey.....	26
3	<u>Notes on Trips in Kenya</u>	19
4	<u>Photographs of the Masai</u>	14

THE LAND AND THE PEOPLE

Masailand is bounded on the west by the Kisii and Kericho districts of Nyanza Province, and on the north as far as Nairobi by European farms and occupied Crown land and the Kikuyu Reserve. From Nairobi the boundary runs in a southeasterly direction and for a hundred miles follows the main railway line to Mombasa. Thereafter, Masailand narrows until it meets the Voi District at Taveta, close to Kilimanjaro. The southern boundary from Taveta to Kisii is the interterritorial boundary with Tanganyika.¹

The Masai, who at the close of the last century ranged over all the open grasslands from Lake Rudolf to the Anglo-German boundary as far south as Mt. Kilimanjaro, now live in the Masai Reserve as defined above and in adjoining Tanganyika. According to Schapera,² there are also in the north Kavirondo District at Kabras, Wamia, Bukayo, and Marach a few scattered remnants of the Masai Gishu, one of the five main divisions³ into which the Masai were formerly grouped.

Closely related to the Masai in both language and culture, if not actually of the same stock, are the Samburu (formerly also called Burkeneji), who number about 20,000 and inhabit an area between Laikipia and Lake Rudolf and bordering on the Northern Frontier District and Turkana. Another allied people are the Enjamusi⁴ (about 1,600) in Baringo District, who are sometimes said to be a heterogeneous tribe made up of scattered Samburu,⁵ Masai, and others.

The Rift Valley, running from north to south, cuts Kenya Masailand into two areas with entirely different scenery, rainfall, and climatic conditions. To the west of the "Rift," after climbing the Nguruman escarpment, the average altitude is about 6,000 feet; Narok, close to the lower slopes of the Mau, has an average rainfall of twenty-five inches. The Loita hills rise to 8,000 feet, with parts of the Mau considerably higher than 9,000 feet. To the west of the district is Trans-Mara, where conditions approximate more closely those in Nyanza Province, with an average altitude of 5,000 feet and a

much heavier rainfall. To the east of the "Rift" are the Kajiado District and the Ngong Hills area; the average altitude of the former is about 5,000 feet, and the annual rainfall varies from fifteen inches in the drier areas of the district to between twenty-five and thirty inches on the lower slopes of Kilimanjaro. Besides this and the well-known big-game country -- between Ol Tokai and Namanga -- Kajiado does not have the scenic beauty of many parts of Narok District; as the result of a low rainfall, it has large areas of semidesert country.

The total area of Masai is 15,000 square miles, of which it is estimated that only 11,000 square miles are usable by stock, owing to the presence of "fly" and the lack of pasture lands. About 50,000 Masai herd approximately 700,000 head of cattle and numerous donkeys, sheep, and goats. The Southern Game Reserve occupies nearly all the eastern half of Masailand.

Since rainfall is the dominant factor in the livelihood of the Masai, the following table in inches has been compiled from the records of the District Commissioner, Kajiado:

RAINFALL IN THE MASAI RESERVE

Place	Years	Average	Place	Years	Average
Athi River...	40	23.84	Masongelani..	38	25.60
Emali ⁶	4	36.63	Mtito Andei..	30	19.84
Kajiado.....	15	18.62	Ngong.....	35	32.25
Kibwezi.....	26	25.41	Namanga.....	5	24.19
Kima ⁷	15	25.41	Potha.....	25	24.42
Kiu.....	38	22.46	Simba.....	14	23.23
Konza.....	29	18.20	Sultan Hamed ⁸	9	30.81
Loitokitok...	9	27.67	Taveta.....	21	24.18
Machakos.....	50	36.01	Tsavo.....	15	14.95
Magadi.....	20	14.87	Ulu.....	31	24.45
Makindu.....	41	25.07	Voi.....	34	20.90
Mashuru.....	3	20.23	Voi Meteorolog- ical Station.	40	22.04

RAINFALL IN 1947

Place	Inches	Place	Inches
Athi River.....	16.88	Loitokitok.....	50.10
Emali.....	40.29	Magadi.....	18.93
Kajiado.....	38.65	Mashuru.....	37.08
Kima.....	32.91	Namanga.....	26.56
Kiu.....	31.91	Simba.....	22.47
Konza.....	16.88	Sultan Hamed.....	30.48
		Ulu.....	34.78

RAINFALL IN KAJIADO DISTRICT, 1947

Month	Kajiado	Loitokitok	Mashuru	Namanga
January.....	1.97	3.89	3.50	4.95
February.....	0.98	1.60	2.37	0.21
March.....	7.96	14.82	6.36	2.28
April.....	12.44	9.94	12.95	4.42
May.....	3.69	0.63	4.40	4.75
June.....	3.29	0.80	3.45	2.32
July.....	1.97	....	....	....
August.....	....	....	0.02	....
September.....	....	....	0.13	....
October.....	....	0.92	....	....
November.....	1.73	11.99	2.90	1.33
December.....	4.62	5.51	....	6.60
Totals.....	38.65	50.10	36.08	26.86

RAINFALL, 1945

RAINFALL AT
KAJIADO, 1946

Month	Kajiado	Loitokitok	Month	Inches
January.....	....	1.20	January.....	1.03
February.....	0.45	1.19	February.....	3.35
March.....	1.27	0.73	March.....	0.57
April.....	3.36	5.33	April.....	1.02
May.....	0.85	1.82	May.....	2.65
June.....	0.08	....	June.....	1.35
July.....	....	....	July.....	0.68
August.....	....	0.12	August.....	0.49
September.....	0.43	0.95	September.....	0.29
October.....	2.16	5.65	October.....	....
November.....	1.32	6.52	November.....	3.53
December.....	1.71	2.75	December.....	1.93
Totals.....	10.63	26.27	Total.....	16.89

According to Sandford (1919), little is known of the early history of the Masai. Their original home was probably between north of Lake Rudolf and the Nile. They migrated in a southeasterly direction so long ago that tradition does not recall any details of the exodus or the reason for it.

The Masai first came into prominence with the discovery of the source of the Nile in 1875 and with the interest then aroused in Europe in opening up a more direct route from the sea than the one then in use from opposite Zanzibar to the southern end of Lake Victoria Nyanza.

To open up this projected route it was necessary to cross the country occupied by the Masai warriors. East-coast traders had often crossed Masailand, but no European had made the attempt until 1882, when Dr. G. A. Fischer, a German naturalist sent out by the Geographical Society of Hamburg, left Pangani opposite Zanzibar with 120 natives and porters to explore the possibilities of this route. Near Little Arusha on the borders of Masailand, Fischer was attacked by Masai, who were beaten off, and the expedition reached Lake Naivasha. The Masai offered stubborn resistance and after four weeks Fischer was forced to return to the coast. About a year later Thomson demonstrated the feasibility of the route by crossing Masailand and reaching Victoria Nyanza from the east (See J. Thomson, 1885).

Accounts of the journey before 1890 by Count Samuel Teleki von Szek, Sir Frederick Jackson, Dr. Carl Peters are given by Sandford (pp. 11-12).

During 1889 a food-purchasing station for caravans proceeding to Uganda was established by Captain F. D. Lugard for the Imperial British East Africa Company at Machakos. In the following year Dagoretti was selected as a more suitable location.

The power of the Masai declined after the year 1890, although the survey and construction of the Uganda Railway forced them to begin the slow march toward civilization. In June, 1894, a Protectorate was established over Uganda including the territory from which the Imperial British East Africa Company had withdrawn its effective control. This remained unchanged until 1902, when the East Africa Protectorate was established. At this time the Masai roamed unmolested on both sides of the Uganda Railway from Molo to Naivasha and on the

southern side from Nairobi to Kiu. They had almost recovered from the cattle plague of 1890-1891 and were once again relatively wealthy. In 1904 it was estimated that the Masai owned 50,000 cattle and 600,000 sheep and goats. The nomadic Masai, who usually spent the cold weather in the valleys and the hot weather in the mountains, sought fresh pastures for their cattle. A few villages existed to which they returned annually.

As soon as it was discovered that the area of the Rift Valley was admirably suited for stock raising and European settlement, the attention of the government was drawn to the question of how far the country could, with safety and justice, be opened to white settlement without encroaching on the native grazing rights. This naturally led to considerable discussion and opposition by the Masai, who resented any restrictions on their pasturage.

In 1904 the Masai were moved from the Rift Valley to Laikipia and from Nairobi to Ngong. Two Masai Reserves were established. The boundaries of the Northern Masai Reserve were the Loroghi Mountains in the north, the Laikipia escarpment to the west, the Lecuswa or Nyam and the Maso Narok on the south and the Kisima on the east. When this area proved inadequate for grazing and water supplies, extensions were granted.

In 1911 the Masai moved into an extended Southern Reserve, which they now occupy.

The population of the Masai Reserve, as given in March, 1948, by Mr. Eric Sweatman, Officer-in-Charge, Masai, is as follows:

POPULATION OF MASAILAND, 1948

Section	Area (in sq.mi.)	Men	Women	Children
Loita.....	980	939	498	785
Purko.....	3,000	6,570	4,201	6,330
Uasingishu.....	700	951	1,017	1,156
Siria.....	500	617	540	680
Il Damat.....	350	65	168	137
Loitokitok.....	2,300	1,872	1,512	2,172
Kaputiei.....	2,100	914	777	1,118
Matapatu.....	1,800	1,314	1,139	1,323
Lodokilani.....	1,500	695	525	779
Il Damat))		
Dalalekotok)		)708	557	807
Purko).....	400	198	314	560
Sigirari)		81	89	170
Kekonyukie.....	1,200	1,049	1,048	1,355
Totals.....		15,873	12,385	17,372

STATISTICAL DATA OF KAJIADO DISTRICT, DECEMBER, 1947⁹

Section	Population	Cattle	Acres
Kaputiei.....	2,827	90,000	960,000
Matapatu.....	4,097	93,000	880,000
Lodokilani.....	2,366	28,000	900,000
Loitokitok.....	5,551	77,000	1,280,000
Dalalekotok.....	3,558	46,000	256,000
Totals.....	18,399	334,000	4,276,000

POPULATION OF KAJIADO DISTRICT, 1947

Native Masai Population

Section	Males	Females	Children	Total
Loitokitok.....	1,871	1,594	2,156	5,551
Lodokilani.....	843	631	892	2,366
Dalalekotok.....	1,065	965	1,528	3,558
Kaputiei.....	947	792	1,088	2,827
Matapatu.....	1,396	1,174	1,537	4,097
Totals.....	6,122	5,086	7,191	18,399

POPULATION OF KAJIADO DISTRICT, 1947
Native Non-Masai Population

	<u>Males</u>	<u>Females</u>	<u>Children</u>	<u>Total</u>
Totals.....	2,102	110	194	2,406

Non-Native Population

<u>Group</u>				
Europeans.....	35	20	27	82
Asians.....	<u>178</u>	<u>63</u>	<u>122</u>	<u>383</u>
Totals.....	215	83	149	445

<u>Group</u>	<u>No.</u>
Europeans.....	83
Asiatics.....	641
Other Africans.....	3,659

The main Masai problem at present is that there is one animal to every ten acres, whereas it is estimated that the land cannot accommodate more than one to twenty acres. In theory, the solution to the problem is simple: to dispose of half the cattle, bank the proceeds for development, and maintain the cattle population in suitable numbers by the introduction of controlled grazing schemes with individual water supplies. The Masai, however, are not convinced that this is the best solution.

The most important Masai chiefs,¹⁰ together with their areas, are as follows:

<u>Chief</u>	<u>Area</u>
Mutungei de Njoonga.....	Athi River to Simba along railway line and south to an average depth of eighteen miles.
Saetwa ole Mberre.....	Bissil, Namanga, Metu, Amboselli.
Ndaretoi ole Katato.....	Magadi, Uaso Nyiro, Snombole, Torka, Olegorsallie.
Kerrengole ole Kise.....	Selengei to Merueshi, Selengei to Amboselli, and all south and east of those lines.
Kipoopo ole Loisa.....	Around Kajiado and including some Minole sections -- Purko, Sighirari, and Il Damat.

According to Schapera,¹¹ the literature on the Masai is voluminous, although much of it is useless for either anthropological or administrative purposes. The standard monograph on the Kenya sections is by Hollis (1905a), but his book is devoted mainly to language, and the descriptions of history, social organization, and custom, although often valuable, are sketchy and miscellaneous. Merker's book (1904), which deals primarily with the Tanganyika section, gives a far more detailed and informative account of Masai culture generally; however, owing to his attempts to establish a "Semitic" origin for the people, much of what he says cannot be accepted uncritically. Other general accounts, often very brief, are found in the writings of such early travelers, missionaries, and officials as Baumann (1894), Eliot (1905), Hind (1901), Hobley (1910), von Höhnel (1894), Jackson (1930), Johnston (1886, 1904), Krapf (1860), McClure (1910), MacDonald (1899), Powell-Cotton (1904), and Thomson (1885). More recent studies are Leakey (1930) and Storrs Fox (1930), both dealing mainly with features of social life, and by Gellinger (1930), who describes the material culture of the Tanganyika section.

The history of the Masai since coming into contact with Europeans is fully described by Huxley (1935) and Sandford (1919); problems of present-day administration are analyzed by James (1939); questions of land, in particular, are discussed in the Report of the Kenya Land Commission, 1932 (pp. 185-203) and in the "Evidence . . ." (vol. 2, pp. 1175-1266); physique and health are described by Orr and Gilks (1931); social and political organization generally are ably described by Fosbrooke (1939) in an unpublished memorandum on the Tanganyika people (which also discusses problems of modern administration). There are smaller papers on age organization and associated rituals by Bagge (1904), Dawson (1933), and Whitehouse (1933), on the life history of the individual by Storrs Fox (1931), and on the kinship system by Hollis (1910); items of customary law have been recorded by Ankermann (1929), Storrs Fox (1932), and Maguire (1928); the modern judicial organization in Kenya is discussed by Phillips (1945, pp. 141-144); religion and mythology are described by Fokken (1917), Fuchs (1910), Johnston (1915), and Merker (1903).

Since the main group, which I studied, lived in the Kajiado District, permission was requested from Mr. G.

C. M. Dowson, District Commissioner, to quote the following excerpts from his Annual Report for 1947.

A record of 38.65 inches of rain was recorded at Kajiado, and a comparative abundance of grazing, in contrast to the past few years, was enjoyed by the Masai. However, since much of the rain fell early in the year and the short rains were scanty, there was a lack of grazing during the later months of the year. The maldistribution of game, as well as of rain, no doubt aggravated this state of affairs, but the main causes remained as formerly: the overstocked condition of Kajiado District in relation to the over-all scarcity of water and the lack of an adequate system of rotational grazing and pasture management; the subsequent denuding of overgrazed areas; the resultant excessive runoff of rain, and consequently a growing waste.

The Masai, however, remained reluctant to attribute their troubles to overstocking; they generally maintained that, given more boreholes, these problems would be overcome. Thus they were unable to see any reason for selling more cattle than to meet the usual expenses of food, clothing, and ornaments. Good progress was made in education at each of the five elementary out schools. The problems of internal economy and usages of the school grazing areas were frequently considered during that year. For example, Loiyangelani School consisted of 32 pupils under one teacher, two school bomas with 185 persons, 1,700 head of cattle, and 470 sheep and goats. Such misuse of the school grazing areas and the loss of the opportunity of teaching the children improved methods of animal husbandry prompted the Principal of the Narok School to suggest changes. Finally, it was agreed with the local Native Council that each school should become a boarding school with an independent borehole water supply, a local Native-Council-owned herd of some 250 cattle to provide milk for the pupils and to be the subject of demonstrations in the school and also for the local section of Masai. The school grazing areas were to be 4,000 acres. It was agreed to conduct this experiment at Loiyangelani.

Public health was put under Mr. S. S. Bhardwaja, Sub-Assistant Surgeon, who was in charge of Kajiado Hospital. He reported that, except for malaria during and after the rains, no serious tropical disease was found in the district. There were two cases of cerebro-

spinal meningitis among workers in the Kenya Marble Quarries. No changes or progress could be made with regard to the housing and sanitary conditions under which the average Masai lived, and gonorrhea and syphilis were reported as being very common among the adult population; surprisingly enough, dysentery was rare. An attempt to deal with gonorrhea by the sale of M & B 693 tablets at cost was discontinued when it was found that this drug did not provide a complete cure. Several cases of anthrax were reported from Kajiado and Magadi; none were fatal. Masai women did not avail themselves of the hospital for delivery of children except in eight cases.

The total number of patients treated at the dispensaries was as follows:

Place	Out Patients	In Patients	Reattendences	Total
Loitokitok...	4,888	191	7,053	12,132
Mashuru.....	3,125	...	3,600	6,725
Namanga.....	<u>1,643</u>	<u>...</u>	<u>963</u>	<u>2,606</u>
Totals...	9,653	191	11,616	21,463

The veterinarian reported 367,000 head of cattle in the Kajiado District. Contagious bovine pleuropneumonia was the most serious disease from which the cattle suffered. Outbreaks were frequent and widespread with constant arguments about quarantine areas. An attempt to deal with the disease by a series of three inoculations at a three-month interval was started in January, but was abandoned at the end of the year, partly because the inoculation, the strength of which had purposely been kept at a minimum so as to cause no deaths, was too weak to be efficacious, and partly because it was considered that even after three inoculations the district would by no means be clear of the disease. During 1947, 202,007 cattle were given one inoculation. Rinderpest inoculations were carried out as usual from May to October. The stock inspector reported that 109,802 cattle were inoculated. Only one outbreak occurred, which was near Kilimanjaro among calves. There were no serious outbreaks of hoof-and-mouth disease.

Concerning cattle branding and earmarks, the following note is on file in the Secretariat, Nairobi. "Every gellata¹² has its own particular brand (ol misherr; plural,

il misheren) or ear-mark (ol bonoto; plural il bonott) and every owner of cattle should theoretically brand or mark his cattle accordingly. Formerly this was always done; it being absolutely necessary on account of the enormous quantities of stock owned by the Masai. Since the famine, however, the custom of branding cattle appears to have fallen very much into abeyance; it being no longer necessary; and it is improbable that it will ever be reintroduced and systematically carried out. I do not mean to convey the impression that Masai do not brand their cattle, but only that they do not do so systematically and on certain principles and that they neither brand the whole of their stock nor all of it alike. With regard to the nature of these brands and ear-marks a gellata mark is apparently an ear-mark on one ear only; on the other is the owner's own private mark; in addition to these the stock may or may not be branded with an additional owner's brand and a gellata brand. If a raided beast is distinctly marked with a brand it is considered unnecessary to brand it a second time with its new owner's brand; the same applies to a beast clearly distinguishable by some other mark such as a scar resulting from the animal being struck by lightning; such a mark is called 'Ol misherr l'aengai.' A Masai will frequently adopt the brand of an enemy whom he has raided."

The 149 male Masai were studied at Ngong,¹³ Selengei, Mashuru and Kajiado from March 27-April 9, 1948. Zekeriah Mungai, local Masai clerk-accountant, acted as interpreter and recorder.

These three series will be grouped into one series, but some notes on the three localities will be added here.

1. Ngong. -- On March 28 I left Nairobi by car at 11.15 and arrived at Ngong, sixteen miles distant, at noon. Mr. Eric Sweatman, Officer-in-Charge, Masai, was expecting my arrival since arrangements had been made at the request of Dr. L. S. B. Leakey and with the approval of the Governor of Kenya, Sir Phillip Mitchell, and Mr. Thornely, Deputy Chief Secretary.

During the day I measured twenty Masai (Nos. 1-20) and one aged Kikuyu, who insisted on passing through the line. Late in the afternoon I purchased a few items such as red ocher, agricultural products used for food, tobacco, and some medicinal herbs with notes on their uses.

2. Selengei and Mashuru. -- About fifty miles south of Kajiado and almost due west of Emale Station on the Nairobi-Mombasa Railroad thirty-four Masai (Nos. 21-54) were measured and observed from April 4-8. Godfrey Njao, Masai schoolteacher at Kajiado, acted as interpreter and recorder. A description of this area is given in Appendix F.

3. Kajiado. -- At the suggestion of Mr. Eric Sweatman, endorsed by District Commissioner Dowson, I made arrangements to be present at the cattle sale at Kajiado on April 9. Here would be assembled several hundred Masai and it might be possible to persuade some of them to submit to the calipers. Fortunately, the cattle sale was postponed for a day; hence the Masai had nothing to do except to wait around. This was a real opportunity. In the shade of a tree tables were set up and a friendly-looking young Masai recruited to hold the anthropometer and assist with measuring the stature and sitting height. Godfrey Njao acted as interpreter and recorder. The measurements on the last twenty Masai (Nos. 129-149)

were recorded by Mr. George Russell of the expedition staff.

During this long day amid songs and dances and the milling Masai mob, I measured ninety-five men with great assistance from British officials and native chiefs, some of whom ordered their men to go through the line. Muneria ole Shepara, Chief of the Kekonyukie Section, was especially helpful. However, they were restless and it was impossible to record more than the measurements. In any event the color of the skin, hair, and eyes was remarkably uniform, so that the data recorded in detail have considerable validity for the entire group measured or seen; the latter must include at least 1,000 Masai men and about 200 women.

STATISTICAL DATA ON MASAI

Birthplace. -- All were born of Masai parents within the Masai Reserve of Kenya.

Occupation. -- One Masai was a clerk, twelve were Muran (young warriors), and the remainder were cattle keepers.

Age. -- The average age was 36.05 (range 18-70), more than two-thirds of the group being from 30-49 years of age. Only seven men were more than 50 years old. It was impossible to persuade the older men to submit to the measurements, which they considered an undignified procedure in public.

AGE DISTRIBUTION

Age	No.	Per cent	Age	No.	Per cent
18-19.....	4	2.72	45-49.....	15	10.20
20-24.....	14	9.52	50-54.....	5	3.40
25-29.....	15	10.20	55-59.....	0	.....
30-34.....	25	17.01	60-64.....	0	.....
35-39.....	40	27.21	65-69.....	1	0.68
40-44.....	27	18.37	70-74.....	1	0.68
			Total....	147	99.99

MORPHOLOGICAL CHARACTERS OF THE MASAI

Skin. -- Of fifty-four Masai examined, the skin color of the forehead and of the inner forearm was recorded as chocolate-brown (33), medium brown (13), and dark brown (8). These groupings are probably valid for large series of Masai. Since the head remains uncovered except for the bird's-feather hat worn during a brief period of initiation, the skin color is the same as the rest of the body. Throughout the Masai tribe there is evidence of Negro blood, usually more accentuated among the women.

Freckles. -- Forty-nine Masai examined had no freckles. Freckles are probably absent throughout the Masai because of their dark skins.

Moles. -- Five Masai of the forty-nine examined had moles on the face or neck.

Hair. -- The hair of the head, beard, and mustache was uniformly black (31) except for one aged Masai with white hair. The young warriors plaster the hair with red ocher and plait it into a kind of pigtail. Since this was artificial coloring, I have not included it in the tables. The texture was medium (22) or coarse (14). In form the hair was frizzly (34). Head-hair quantity was recorded as average (31) and double plus (5). Three men showed traces of baldness. Twelve men had no trace of beard development, and eight had some hair on the chin. Hair was absent on the chest in nineteen cases, two men having some, with only one in the double-plus category. Twenty-one men had no gray hair, seven had some, two considerable, and one man had white hair. In the beard, nineteen Masai showed no indication of grayness; but six had some, and two had considerable.

HAIR

Color	No.	Per cent
Black.....	35	97.23
White.....	1	2.77
Total.....	36	100.00

HAIR		
Form	No.	Per cent
Straight.....	0	.....
Low waves.....	0	.....
Deep waves.....	0	.....
Curly.....	2	5.00
Frizzly.....	34	85.00
Woolly.....	4	10.00
Total.....	40	100.00

Texture	No.	Per cent
Coarse.....	14	36.84
Medium.....	22	57.89
Fine.....	2	5.26
Total.....	38	99.99

Eyes. -- All Masai eyes were brown (52). No light eyes were seen. However, the fact that there were nine men with gray-brown, green-brown, and blue-brown eyes indicated some submerged blondism within the Masai. This character probably indicates some admixture with an adjoining tribe but may well go back several generations, and should be examined further among a large series of Masai.

The following individual notes were recorded: No. 43 (aged 45), vision poor with cataracts; No. 4 (aged 40), vision poor, especially left eye; Nos. 11 (aged 20) and 16 (aged 35), vision poor in left eye, the former because of a cataract; Nos. 9 (aged 30) and 29 (aged 35), vision poor in right eye; No. 9 (aged 30), blind left eye; No. 36 (aged 18), right eye out of alignment; No. 8 (aged 45), No. 26 (aged 45), No. 42 (aged 35), and No. 47 (aged 40) had blue-ringed sclera.

EYES

Color	No.	Per cent
Black.....	0	.....
Dark brown.....	43	82.69
Blue-brown.....	7	13.46
Green-brown.....	1	1.92
Gray-brown.....	1	1.92
Total.....	52	99.99

EYES

<u>Iris</u>	<u>No.</u>	<u>Per cent</u>
Clear.....	34	66.66
Zoned.....	12	23.52
Spotted.....	<u>5</u>	<u>9.80</u>
Total.....	51	99.98

Browridges. -- The majority (33) possessed average, three being in the lower and three in the higher categories.

Eyebrows. -- The eyebrows tended to be light. Six Masai were observed with none, probably from depilation. Three young men had a few hairs in each eyebrow.

Eyebrow Concurrence. -- Six men had none, six had some, and seven average.

Nose. -- The nasal profile showed remarkable variation, the highest percentage being concave. The nasal wings were medium to flaring. Sixteen Masai had thin nasal tips, thirty-one were average, five were recorded as double plus, and one was in the triple-plus category. The alae were average (30), compressed (2), flaring (16), and flaring plus (5).

NOSE

<u>Profile</u>	<u>No.</u>	<u>Per cent</u>
Wavy.....	13	8.96
Concave.....	60	41.38
Straight.....	27	18.62
Convex.....	45	31.03
Concavo-convex.....	<u>0</u>	<u>.....</u>
Total.....	145	99.99

<u>Wings</u>	<u>No.</u>	<u>Per cent</u>
Compressed.....	2	3.70
Medium.....	31	57.40
Flaring.....	<u>21</u>	<u>38.89</u>
Total.....	54	99.99

Mouth. -- The integumental thickness of the lips was double plus (33), with only eleven Masai in the average category. No Masai had thin lips. As to eversion of the lower lip, the majority (33) were triple plus, with

eight Masai recorded as double plus. No. 49 had a harelip.

Teeth. -- Eruption was complete (49), only two men being recorded with incomplete dentition. The occlusion tended to be marked-over (29), the remainder (23) having a normal slight overbite. Crowding was either absent (49) or slight (5). However, in the lower jaw the teeth were sloping because two lower front teeth are knocked out during puberty rites. More than half (29) the group had lost a few teeth; twenty had lost none. The wear was less than average. My general impression was that the Masai possessed excellent, regular, white teeth with almost no caries or crowding. The condition of the teeth is the finest I have ever recorded. I recommend that a study be made of the dentition of the Masai, especially in relation to their diet, which consists mainly of blood and milk with an occasional piece of eland meat.

TEETH

<u>Bite</u>	<u>No.</u>	<u>Per cent</u>
Under.....	0	.....
Edge-to-edge.....	0	.....
Slight over.....	23	44.23
Marked over.....	<u>29</u>	<u>55.77</u>
Total.....	52	100.00
<u>Loss</u>	<u>No.</u>	<u>Per cent</u>
None.....	20	38.46
Few.....	29	55.77
Some.....	2	3.85
Plus.....	<u>1</u>	<u>1.92</u>
Total.....	52	100.00
<u>Wear</u>	<u>No.</u>	<u>Per cent</u>
Absent, some.....	47	88.68
Plus.....	<u>6</u>	<u>11.32</u>
Total.....	53	100.00

Ears. -- Many Masai puncture the ear lobes and lengthen them by inserting brass or copper rings. Hence, few data could be recorded. The left ear lobe was attached (5), soldered, (2) and free (1). Eleven men had average-sized ears, with seven having slightly smaller. Ear protrusion was normal in sixteen cases, there being one individual in the lesser and greater categories.

Musculature and Health. -- The Masai men and women seemed in excellent health and had well-developed musculature. The young warriors, of whom there are about 5,000, are almost perfect specimens of manhood.

Summary. -- The average Masai had a chocolate-brown skin and frizzly, black hair of medium texture. The eyes were dark brown with clear sclera. The nasal profile was extremely variable, the largest group being concave with medium wings. The lips tended to be thick with marked lower lip eversion. The teeth, musculature, and health were excellent.

STATISTICAL ANALYSES OF MASAI

Stature. -- The Masai were tall or very tall, the mean being 172.68 (range 150.0-194.0).

STATURE

Harvard System	No.	Per cent
Short (x-160.5).....	8	5.44
Medium (160.6-169.4).....	33	22.44
Tall (169.5-x).....	<u>106</u>	<u>72.11</u>
Total.....	147	99.99

Keith System	No.	Per cent
Short (x-159.9).....	6	4.08
Medium (160.0-169.9).....	42	28.57
Tall (170.0-179.9).....	70	47.62
Very tall (180.0-x).....	<u>29</u>	<u>19.72</u>
Total.....	147	99.99

Sitting Height. -- The mean (81.85) was exceptionally high, the majority of the Masai possessing long (80.0-x) trunk lengths.

Minimum Frontal Diameter. -- The forehead was wide -- or even very wide -- with a mean of 117.38 (range 106-141).

MINIMUM FRONTAL DIAMETER

Group	No.	Per cent
Very narrow (x-99).....	0	.....
Narrow (100-109).....	9	6.04
Wide (110-119).....	91	61.07
Very wide (120-x).....	<u>49</u>	<u>32.88</u>
Total.....	149	99.99

Head Breadth. -- The head was wide or narrow, with a mean of 140.50 (range 124-158).

HEAD BREADTH

Group	No.	Per cent
Very narrow (120-129).....	3	2.01
Narrow (130-139).....	64	42.95
Wide (140-149).....	76	51.00
Very wide (150-x).....	<u>6</u>	<u>4.03</u>
Total.....	149	99.99

Cephalic Index. -- The Harvard system places 88.59 per cent in the dolichocephalic category. The Keith system groups almost one-third of the Masai in the mesocephalic (75.1-79.9) division. The mean head length was 194.34, and the head breadth was 140.50, with a resultant cephalic index of 72.84. The Keith classificatory system shows 12.75 per cent in the ultradolichocephalic (x-70.0) group.

CEPHALIC INDEX

Harvard System	No.	Per cent
Dolichocephalic (x-76.5).....	132	88.59
Mesocephalic (76.6-82.5).....	16	10.73
Brachycephalic (82.6-x).....	<u>1</u>	<u>0.67</u>
Total.....	149	99.99

Keith System	No.	Per cent
Ultradolichocephalic (x-70.0).....	19	12.75
Dolichocephalic (70.1-75.0).....	90	60.40
Mesocephalic (75.1-79.9).....	35	23.49
Brachycephalic (80.0-84.9).....	4	2.68
Ultrabrachycephalic (85.0-x).....	<u>1</u>	<u>0.67</u>
Total.....	149	99.99

Facial Measurements and Indices. -- The upper part of the face showed great variation, the largest groups being medium long or medium short. The mean was 69.95 (range 56-86). The total facial height also showed great variation, but 61.08 per cent were medium long or long (120-x). The mean was 121.45 (range 75-139). The total facial index places the largest number (44.96 per cent) of Masai in the leptoprosopic group. The mean was 89.00 (range 66-102).

FACIAL MEASUREMENTS

Upper Facial Height	No.	Per cent
Short (x-63).....	19	12.75
Medium short (64-69).....	47	31.54
Medium long (70-75).....	57	38.25
Long (76-x).....	<u>26</u>	<u>17.45</u>
Total.....	149	99.99

Total Facial Height	No.	Per cent
Short (x-109).....	10	6.71
Medium short (110-119).....	48	32.20
Medium long (120-129).....	72	48.33
Long (130-x).....	<u>19</u>	<u>12.75</u>
Total.....	149	99.99

TOTAL FACIAL INDEX

Group	No.	Per cent
Euryprosopic (x-84.5).....	33	22.15
Mesoprosopic (84.6-89.4).....	49	32.88
Leptoprosopic (89.5-x).....	<u>67</u>	<u>44.96</u>
Total.....	149	99.99

Nasal Measurements and Indices. -- The Masai possessed noses medium in height, medium wide to wide, and a mesorrhine index. The mean height was 54.46 (range 43-64), and the breadth was 39.20 (range 32-50), with an index of 71.98 (range 57-100). There were sixteen Masai (10.73 per cent) in the platyrrhine group, indicating Negro blood.

NASAL MEASUREMENTS

Nasal Height	No.	Per cent
Short (x-49).....	20	13.42
Medium (50-59).....	106	71.14
Long (60-x).....	<u>23</u>	<u>15.43</u>
Total.....	149	99.99

Nasal Breadth	No.	Per cent
Very narrow (x-29).....	0	.....
Medium narrow (30-35).....	14	9.39
Medium wide (36-41).....	103	69.13
Wide (42-x).....	<u>32</u>	<u>21.47</u>
Total.....	149	99.99

NASAL INDEX

Group	No.	Per cent
Leptorrhine (x-67.4).....	42	28.19
Mesorrhine (67.5-83.4).....	91	61.07
Platyrrhine (83.5-x).....	<u>16</u>	<u>10.73</u>
Total.....	149	99.99

To furnish additional statistical data for comparison with other Harvard series, the following tables have been prepared:

MASAI OF KENYA

Sitting Height

[illegible]

Minimum Frontal Diameter

Head Breadth	x-99		100-109		110-119		120-x		Totals	
	No.	%	No.	%	No.	%	No.	%	No.	%
120-129.....	0	0	1	0.67	1	0.67	1	0.67	3	2.01
130-139.....	0	0	5	3.36	44	29.53	15	10.07	64	42.95
140-149.....	0	0	3	2.01	46	30.87	27	18.12	76	51.01
150-x.....	0	0	0	0	0	0	6	4.03	6	4.03
Totals.....									149	100.00

Biszygmatic Breadth

Total Facial Height	x-124		125-134		135-x		Totals	
	No.	%	No.	%	No.	%	No.	%
x-114.....	1	0.67	8	5.37	11	7.38	20	13.42
115-124.....	0	0	21	14.09	56	37.58	77	51.68
125-x.....	0	0	12	8.05	40	26.85	<u>52</u>	<u>34.90</u>
Totals.....							149	100.00

Upper Facial Height

Total Facial Height	x-63 No.	%	64-69 No.	%	70-75 No.	%	76-81 No.	%	82-x No.	%	Totals No.	%
130-109.....	5	3.36	4	2.68	1	0.67	0	0	0	0	10	6.71
110-119.....	11	7.38	24	16.11	12	8.05	1	0.67	0	0	48	32.21
120-129.....	3	2.01	18	12.08	38	25.50	11	7.38	2	1.34	72	48.32
130-x.....	0	0	1	0.67	3	4.03	10	6.71	2	1.34	19	12.75
Totals.....											149	99.99

Nasal Width

[illegible]

MEASUREMENTS AND INDICES OF MASAI OF KENYA

Measurements	No.	Range	Mean	S. D.	C. V.
Age.....	147	18-70	36.05 ± 0.51	9.10 ± 0.36	25.24 ± 0.99
Stature.....	147	150-194	172.68 ± 0.42	7.59 ± 0.30	4.40 ± 0.18
Sitting height.....	148	66-93	81.85 ± 0.24	4.35 ± 0.17	5.31 ± 0.21
Head length.....	148	178-213	194.34 ± 0.39	7.05 ± 0.28	3.63 ± 0.14
Head breadth.....	149	124-158	140.50 ± 0.29	5.25 ± 0.20	3.74 ± 0.15
Minimum frontal diameter....	149	106-141	117.38 ± 0.27	4.88 ± 0.19	4.16 ± 0.16
Bizygomatic diameter.....	149	114-151	136.95 ± 0.31	5.60 ± 0.22	4.09 ± 0.16
Bigonial diameter.....	149	96-156	110.82 ± 0.38	7.00 ± 0.28	6.32 ± 0.25
Total facial height.....	149	75-139	121.45 ± 0.45	8.10 ± 0.32	6.67 ± 0.26
Upper facial height.....	149	56-86	69.95 ± 0.32	5.85 ± 0.23	8.36 ± 0.32
Nasal height.....	149	43-64	54.46 ± 0.26	4.64 ± 0.18	8.52 ± 0.33
Nasal breadth.....	149	32-50	39.20 ± 0.17	3.06 ± 0.12	7.81 ± 0.30
Ear length.....	12	53-66	57.74 ± 0.84	4.32 ± 0.59	7.48 ± 1.03
Ear breadth.....	12	30-40	36.01 ± 0.55	2.82 ± 0.39	7.83 ± 1.08
<u>Indices</u>					
Relative sitting height.....	147	36-55	47.68 ± 0.12	2.16 ± 0.09	4.53 ± 0.18
Cephalic.....	148	65-87	72.84 ± 0.18	3.33 ± 0.13	4.57 ± 0.18
Fronto-parietal.....	149	74-92	83.26 ± 0.18	3.30 ± 0.13	3.96 ± 0.16
Zygo-frontal.....	149	76-92	85.54 ± 0.18	3.00 ± 0.11	3.51 ± 0.13
Zygo-gonial.....	149	71-122	81.01 ± 0.32	5.73 ± 0.22	7.07 ± 0.28
Total facial.....	149	66-102	89.00 ± 0.34	6.15 ± 0.24	6.91 ± 0.27
Upper facial.....	149	41-63	51.20 ± 0.24	4.38 ± 0.17	8.55 ± 0.34
Nasal.....	149	57-100	71.98 ± 0.47	8.48 ± 0.33	11.78 ± 0.46
Ear.....	12	46-70	59.90 ± 1.21	6.20 ± 0.86	10.35 ± 1.42
Cephalo-facial.....	149	87-105	97.55 ± 0.18	3.15 ± 0.12	3.23 ± 0.13
Fronto-gonial.....	149	85-145	94.40 ± 0.27	4.85 ± 0.19	5.14 ± 0.20

SUMMARY

The average Masai was tall or very tall, with a long trunk length, and possessed a wide or very wide forehead, wide or narrow head, dolichocephalic index, medium long or medium short upper and total facial heights, with a leptoprosopic or mesoprosopic index, a nose medium in length and width and a mesorrhine index.

COMPARATIVE DATA

The following anthropometric data¹⁴ were obtained by Leys and Joyce from the following sources: in the town surgery at Mombasa; at a nearby Mission station; from prisoners in Mombasa Jail; and from applicants for the police force.

MEASUREMENTS AND INDICES ON 91 MASAI MALES

Measurement	Mean
Stature.....	66.98 (about 170.0)
Head length.....	194.67
Head breadth.....	142.49
Nasal height.....	50.13
Nasal breadth.....	38.10

MEASUREMENTS AND INDICES ON 91 MASAI MALES

<u>Indices</u>	<u>Mean</u>
Cephalic.....	73.21
Nasal.....	76.16

Fuller measurements of twelve male and thirty-nine female Masai were published by Merker.

Some data, including statures and weights of male Masai, were recorded by Gilks and Orr.

APPENDIX A

ENGLISH-MASAI AND MASAI-ENGLISH PHRASE BOOK

The purpose of this Phrase Book is to serve as a guide to useful words and phrases in English and Masai.¹⁵

It will suffice to indicate here a few rules of an initiatory character:

Pronunciation

The vowels are pronounced as in the following English words:

"a" is pronounced as "a" in "father"
"e" is pronounced as "a" in "fate"
"è" is pronounced as "e" in "benefit"
"i" is pronounced as "i" in "ravine"
"o" is pronounced as "o" in "not"
"ò" is pronounced as "o" in "mole"
"u" is pronounced as "u" in "bull"

There are certain consonants that never appear in Masai: "f," "q," "v," "x," "z." "C" is used only with "h" -- "ch," as in "enchorro," "enchani."

Personal Pronouns

They are: nano = I; iylook = we; iyie = you; ntay = you (pl.); nenye = he or she; and nenche = they.

The pronoun almost always comes before the verb, except in questions, for example:

Iylook ootara (v) tenjore = We killed in the raid.

Ilo (v) iyie metabayke? = Will you be going tomorrow?

Transliteration

The method of transliteration¹⁶ employed is the new system adopted in teaching English in the Masai schools developed by Miss Margaret N. Le Riche.

Of about 50,000 Masai men, women, and children in 1948, only about fifty men speak English with any degree

of fluency. However, with the new methods, combined with fresh incentives, English will be understood by many more Masai during the coming decade.

Vocabulary

In addition to the useful phrases, a vocabulary has been completed both in Masai-English and English-Masai. After eliminating such sections as "Arrival at the Coast" and "In the Office," which naturally do not apply to the Masai way of life, a few hundred words have been added to those used in the English-Swahili Phrase Book.

ENGLISH-MASAI

Periods of the Day

Sunrise.....	Engakenya
Sunset.....	Enteipa
Very early morning.....	Enasirie
Morning.....	Tadekenya
Noon.....	Enaipirie engolong
Afternoon.....	Etushuke engolong
Evening.....	Teipa
Night.....	Kewarie
Day.....	Dama
All day.....	Engolong(or)endama pooke

Numerals

One.....	Nabo
Two.....	Are
Three.....	Uni
Four.....	Onguan
Five.....	Imiet
Six.....	Lle
Seven.....	Naapishana
Eight.....	Isiet
Nine.....	Naaudo
Ten.....	Tomon
Eleven.....	Tomon obo
Twelve.....	Tomon oare
Thirteen.....	Tomon ookuni
Fourteen.....	Tomon onguan
Twenty.....	Tikitam

Thirty.....	Tomoniuni
Forty.....	Artam
Fifty.....	Onom
Sixty.....	Ntomonile
Seventy.....	Ntomoninaapishana
Eighty.....	Ntomonisiet
Ninety.....	Ntomoninaaudo
One hundred.....	Ip nabo
Two hundred.....	Ip are
Three hundred.....	Ip uni
Four hundred.....	Ip onguan
Five hundred.....	Ip imiet
Six hundred.....	Ip lle
Seven hundred.....	Ip naapishana
Eight hundred.....	Ip isiet
Nine hundred.....	Ip naaudo
One thousand.....	Ip tomon

General Greetings and Visiting

- (a) Greetings.....Nkirokinot
 Good morning.....Sopa
 Entasopa (pl.)
 Takwenya (Female)
 Entakwenya (pl.)
 How do you do?.....Era supati?
 It is well with me.....Ara supat
 What is your (health)
 condition?.....Era blooto?
 I am well.....Ara blooto
 How are you?.....Erara supati? (pl.)
 Good news.....Kera supati (pl.)
 Bad news.....Kenyamal (or) lomon torrok
 Farewell or goodbye.....Sere (or) looleng
 Goodbye (until we meet
 again).....Sere (s) (pee kitumo ake)
 What is your news?.....Kakwa omon eyatata?
 We are well.....Kiserian
- (b) Visiting.....Muta
 Soliciting entrance to
 a house.....Enjngunoto engaji
 May I come in?.....Ajengo?
 You may come in.....Tejengo
 The visitor enters.....Etijingua olamutanani

It is raining.....Eshaaita
It has cleared up now.....Eisiashaua taata
Kneel down.....Tegela kong
Let us go now.....Maape taata
Look!Ngora!
Look for.....Ngoro
Let me pass.....Ntasho matulusoi
Many days since.....Etulusoitie ngolongi
 kumok ana
No!A-a!
One of you has done wrong..Eitarruoyie obo linyi
Open the door.....Tabolo engaji
Open the window.....Tabolo elusie
Pardon, excuse me.....Tapalakake
Push it hard.....Turrumoi
Put it in front.....Rragie tedokoya
Put this stone behind.....Rragie ele soit te siadi
Raise it higher.....Todomo lepie
Return to the house.....Tushukoyu aji
Remove that litter.....Ntayu nena suut
Run away.....Mpirrio
 Empirrio (pl.)
Send another man.....Rrewai lekay tongani
Sit down.....Totona te nkop
Stand up.....Inyio (or) ntasho
Say it again.....Nyaake tejo
Speak up.....Tabuaa
Silence.....Tegerayu
 Entegetata (pl.)
Take care.....Ntobera (or) tabarake
Tell me.....Tolikioki
Take it away.....Ewa (or) iwuangie
Thank you.....Ashe
The sun is hot today.....Eiroua taata engolong
There is something here...Eti1 tókí ene
There is something there...Eti1 tókí idie
There is something in
 here.....Eti1 tókí atua ene
There is nothing here....Meti1 tókí ene
There is nothing there....Meti1 tókí idie
There is nothing inside...Meti1 tókí atua
Use this knife.....TaasisHERE ena alem
Unfasten the rope.....Talaa engopito
Very well.....Sidai oleng
Wait awhile.....Ntasho penyo (or) taanyo
 penyo

Before sweeping a room, remove
 mats and chairs.....Eton eito iwor engaji,
 iwuangle lonito olorikan
 Rub the table.....Tujuto emesa
 Dust the furniture.....Tujuto ntokitin pooke eaji
 Clean the windows.....Tujuto ldirishani
 Do not miss the corners.....Minguaa nkutot
 Use clean dusters every time...Tujutishore njuteta sidan
 anaake
 Polish the brass things.....Tujuto (or Teseka)
 ntokitin oosoyan
 Shut the door.....Nkeno kotok-aji
 Lay the table.....Ntobera emesa
 That plate is not clean.....Mme sidai idia siniyia
 Has the water been boiled?....Keteyiarake duo ena are?
 Is there water in the filter?..Ketii engare atua oljiet
 Bring some lemonade.....Tao lnganayio
 You have forgotten the salt,
 pepper, and mustard.....Kitorikine shumpi,
 opilipili, o "mustard"
 I want some vinegar.....Ayieu enkete ampu
 You may clear away the
 things now.....Ndem aiwuangle taata
 ntokitin
 Make the bed properly.....Ntobera erruat notoki
 Put down the mosquito net.....Ntadou engarasha
 engonjongani
 Tuck it under the mattress....Ntabolu tiaabori lmutoi
 Do not let a mosquito get in...Mencho engonjongani ejeng
 atua
 Light the lamp.....Nnuaa oltaa
 There is no oil in the lamp...Mmetii oltaa eyelata
 It needs a new wick.....Eyleu entampi ngejuk
 Put out the light.....Taara oltaa
 I want hot water every morning.Ayieu engare nairoua
 anaake tadekenya
 Come early in the morning.....Tayeku tadekenya
 Bring the tea at ... Yao shaa! saa ...
 You are very late.....Imutie
 We want breakfast at ... Kiyieu endaa saa ...
 Take this letter to ... Ewa ena palai eyake ...
 Wait for the answer.....Taanyo ewalata
 Do not loiter on the way.....Mimutie tengoitoi
 Wake me at ... Inyeyieki saa ...
 Do not forget what I say.....Mincho kirikino enajo

Get the bath ready.....Ntobera ewueji naitukuore
 Where is my umbrella?.....Koree olmampuli lai?
 I will teach you how to do it..Aaliki eningo tenentober

Laundry

Can you do laundry work?.....Ndem enkitukore?
 Do you understand ironing?.....Iyiolo ataara pasi?
 Wash these clothes for me.....Sojakake kona kelani
 You have not ironed them well..Eito apa eyar pasi atumoki
 Fold the clothes carefully.....Tegela nkelani notoki
 These collars have no starch...Mmetii kona gotooni
 erropili

These clothes are very dirty...Eata kona kelani oloierio
 Put the clothes to soak.....Ntengela nkelani
 Iron the lace with great care..Taara "lace" pasi akete
 Mind, that vest will shrink....Tayiolo ajo kenunvari idia
 "vest"

Do not use too much soda.....Mepek emakat sapok
 This color will not come out...Mmepuku ena mua
 The soap is finished.....Etomote oloonkelani
 You have broken all the

buttons.....Etegela nkisunguuni pooke
 Do not wash so roughly; you
 will tear the clothes.....Minyialake enkitukuoto;
 ano epolos nkelani

Fold the clothes neatly.....Ntoberake nkelani engelata
 Do not crumple the tablecloth..Minunuk engarasha emesa
 Let these blankets be washed
 today.....Nchoo meitukui taata kolo
 miranketini

Change the water and rinse
 the clothes.....Mbelekenya engare nemonerie
 nkelani

You are a good servant.....Era osinga supat
 You are a bad servant.....Era osinga torrongo
 What are you complaining of?...Ainyoo naa pee engonyongony?
 Do not argue with me.....Mekenchangarrare nano
 You are very rude.....Iwuasa oleng
 Do not answer me back.....Mikishukoki ewalata
 Is it clear to you?.....Eibala teyie?
 You are responsible for
 everything.....Iyie oitore pooke toki
 Do not pretend to be ill.....Mintaakuno imuoi
 Of what tribe are you?.....Era olialo osho?

You are a busybody.....Era olongani onyamal
I will consider the matter....Adamo ana baye
Put them in order.....Nkereriyie pooke
That is right.....Esepa taa nna
Where are the boys?.....Koree ngaylok?
If he had come, he would
 have known.....Tena keeuo anaata eyioloi
I do not know where he is.....Mayilolo enetii
Put that chair by the door....Tepeka elde orika embata
 ekotokaji
We need charcoal for the
 iron today.....Kiyieu nkuk epasi ade
 taata
Do not be late.....Minute ake
Unless you do this, I shall
 reduce your wages.....Teneito eyas ena nadung
 olomoshaara lino
If you do well, I shall
 increase your wages.....Teniaas esidai napon
 olmoshaara lino

Cook and Kitchen

Where is the cook?.....Koree olayiarani?
Call the cook.....Mpoto olayiarani
Do you know how to cook well?..Iyiolo ateyierisho oleng?
The fire has gone out.....Etua enkema
There are plenty of matches....Etii nkibiritini kumok
You cannot cook without a fire.Mmedem ateyierisho miaata
enkema
Is there much firewood?.....Ketii lkeek kumok?
He has not yet cut the
firewood.....Eton eito edungu l'keek
This firewood does not burn
well.....Mmeyierisho kolo lkeek
These pieces are too large....Sapuki kona oben (or) dungot
They will not go into the
stove.....Mmeyem elusie enkema
You have not removed the ashes.Eito iwor inkuruon
This is why the fire does
not burn.....Nna pee mepok enkema
This is why the oven is not
hot.....Nna pee meiroua
The stove pipe is blocked
with soot.....Eikeno olmorare elusie

The smoke will not pass.....Meyem empurao
I want some tea.....Aiyieu enkete shaa
The water is not yet boiling...Eton eito eitoketok engare
Have you put the leaves in
the teapot?.....Etepika mbenek atua emoti
eshaai?
Can you make a cake?.....Ndem aitayu "cake"?
The milk has gone bad.....Etarruoitie kole
Boil the milk each morning....Teyiara kole anaake
tadekenya
This saucepan is not clean....Mme sidai ena moti
The frying pan leaks.....Kewo emoti naikaraankishoreki
It has a hole in it.....Eata naudoto
Fill the kettle with water....Mpota embirika engare
Wipe the knives or they
will become rusty.....Tujuto ngalema medoru
Wash the cups inside and out...Soja nkikompeni atua
woorlong
Do not drop the saucers.....Mentadoyio saanini
Fill the tank.....Mpota embirika
Use a large spoon.....Ntobirishore enkijiko sapok
Do not lose the teaspoons.....Menterraa inkijikoni
You have spoiled your cooking..Ntarruoyie eyilarare ino
Be careful not to spill the
milk.....Toduaa mimbukoo kole
Put in a few drops of
flavoring.....Tepeka ilkiyio oote
lenamelok
The soup is burned.....Etejenga motori empurao
Cover the food.....Tepesenga endaa
Add a little hot water.....Topona enkete are nairoua
Cook the vegetables well.....Nchoo ngaytobolo ewoku
Is the food ready?.....Ketabaua endaa?
When the food is ready,
dish it up.....Tenewoku endaa negel
Where is the tea strainer?....Koree enjiet eshaai?
Grate the coconut.....Tekanya ele nganayioi
Where is the coconut grater?...Koree enkenyet olnganayio?
Please yourself.....Anaa eniyieu (or) nteshepa
kewan
Roast the potatoes.....Irouajie nkuashen
You use too much fat.....Epek eyelata sapok
I want stew for lunch today....Ayieu "stew" tendaa ade
edama

Drain all the water from

the vegetables.....Tubuku engare tlaatua
 endaa vesho

The food is quite cold.....Keirobe endaa tokol

I am hungry.....Aata esumash

I want something to eat.....Avieu entoki nanya

I want something to eat.....Aayda enook
I am thirsty.....Aata engore

I want something to drink.....Ayieü entoki nawok

We will breakfast punctually

at ... Kibol inkutukie saa ...

Stir the porridge frequently...Ngolengola oloshoro
anaadake

Fry the bacon and eggs.....Teylara nkiri olditir
olmosor

Boil the eggs.....Rouajie lmosor

Do not let them be hard.....Mincho egolu

Fry the fish in plenty of fat..Teylerie senger eyelata
sapok

The fire is too hot.....Keiroua enkema oleng

This coffee is very strong.....Keirrosha ena shaa!¹⁷

Make the toast.....Tape 10 mokateni

I want you to go to the

market now.....Ayieu nilo taata esokor

Write down everything you buy..Ngero pooke toki ninyiango

Tell me the price of each

thing.....Tolikioki enkinyianga
entoki nabo

Change this ... -shilling note. Tegela ena noti o ...

Do not make a mistake with

the change.....Mincho kirikino naainguare

What kind of meat can be

had today?.....Kaa pukunoto onkiri etumi
taata?

Perhaps beef, perhaps mutton...Ebayke naa nkiri onkishu,
nebayke naa noontare

I want you to bring four

sheep's tongues.....Ayleu neyao lngejepa
onguan loontare

What is the price of eggs?.....Ainyoo enkinvianga olmosor?

How many eggs do you require?..Kaja lmosor liyieu?

What sort of fruit and vege-

tables are in the market?...Kaa pukunoto olnganayio
ongaytobolo naati sokoni?

Well, buy oranges, a large pine-
apple, limes, and bananas....Aiyia, inyangio lmashungua,
nanasi sapok, ontimu
olmariko
This fruit is very cheap.....Kelelek ele nganayioi
The vegetables are very
expensive.....Kegol ngaytobolo
How are fowls sold these days?Kaji etiu emerata
olukunguni kona alongi?
Buy two kidneys.....Inyangioi lairakuj oare
I want also two cucumbers
for afternoon tea.....Ayieu sii "cucumbers"
oare teshaai e dama
Buy also some raisins,
ginger, and cloves.....Inyangio sii "raisins"
oltangausi o "cloves"
Let us reckon up every day
the cost of food.....Matayiololo enkinyanga
endaa ake tengolong
We shall have visitors
for dinner.....Kitum llomon ade tendaa
eteipa
Let the food be ready in time..Ntawo endaa tenkata nanare
We will dine at 7:30.....Kedaa saa nabo olupisiai
Let there be no confusion.....Mincho ejeng olongolengole

Each load must be its fair
 weight.....Meata olola lemeiroishi
 enkiroishi nanare
 Place the loads in line.....Entoosho lolan olkereri
 Are all the loads ready?.....Keyeshakinote lolan pooke?
 Go on ahead.....Nturuko
 We have no rope.....Mikiaata ngopit
 Have you packed up the tools,
 such as hoes, machetes, axes? Irotoko ntokitin anaa
 njembe, lpangai, ontoluo?
 Can we get milk and eggs on
 the way?.....Aikendem aanoto kole
 olmosor tengoitoi?
 Before we reach camp?.....Eton eito kebaya engampi?
 How far is it by foot?.....Kebaa elakwani tonkejek?
 How long will it take by
 motor car?.....Kebaa elakwani temotokaa?
 Is there good water there?.....Ketii engare sidai ine?
 Is the water permanent?.....Aimeneta nna are?
 When you get to ... , you
 must.....Tenebaya e ... nentober
 If you get toTenilo pee ebaya ...
 If you do not get toTeneito ilo abaike ...
 Why did you ...?.....Ainyo pee ...?
 Why did you not ...?.....Ainyo pee eito ...?

Camp

Clear away the scrub.....Tudungo llo sanag
 Let some porters draw water....Nchoo kolekay singan
 metooku engare
 Let others bring firewood.....Nchoo kolekay eyao lkeek
 Let the others pitch the tents.Nchoo kolekay eun e yema
 Clear and brush the ground
 between those pegs.....Isiashayie osanag tekop
 te reshata ekonda sheito
 Remove roots and stones and
 fill up the holes.....Iwuangie ntana osoito
 nenok ngumot
 Pitch all the white men's
 tents in line.....Ntoosho yemai oloopokenya
 olkereri maanaabo
 Pitch this tent facing thus,
 so that the midday shade
 will cover it.....Tuuno ena yema meingora
 idie pee ejeng oloip
 lenteipa

- Where does the sun rise?.....Aitiaaji ailepo engolong?
 Where does the sun set?.....Atiaaji edoyio engolong?
 Tell ... men to bring enough
 firewood to last all night...Tiaake ... tongana meyao
 lkeek oyesho enkewarie
 pooke
 Light large fires.....Inuaa nkemaitie sapuki
 Keep watch by turns.....Entorripisho tooreshat
 How many days' rations are
 left?.....Kenoongolongi aja enkurma
 natelekoa?
 Can posho be obtained there?...Keideme aanoto enkurma
 teidie?
 Can wood be obtained there?...Keideme aanoto lkeek
 teidie?
 Make a platform to put the
 loads on.....Ntobera olperere oiteleykene
 lolan
 So as to prevent them
 getting wet.....Pee kimitiki eshalu
 Put this in a dry place.....Tepeka ena (ele) ewueji
 netoyio
 Put this in a cool place.....Tepeka ena (ele) ewueji
 neirobe
 Put this in a hot place.....Tepeka ena (ele) ewueji
 neiroua
 What game is there here?.....Kakwa nguesi naangori
 naatii ene?
 See that these skins are
 always in the shade and
 kept cool.....Ngora metejenga kolo onito
 oloip anaake netone eirobe
 Tell the cook to have water
 ready for baths when we
 return.....Tiaake olayiarani meirragie
 engare nikintukuore
 tenikishukunyie
 Which is the nearest road
 (way) back to camp?.....Kaa oitoi nataana
 tenikishuko engampi?
 Go to the camp and bring.....Shomo engampi yao

While ... looks after the
 tables and chairs, ... must
 get the beds and mosquito
 nets fixed in the tents.....Tenkata ... nengoraa nesepo
 mesai olorikan nentober
 irruatin engarasha engojon-
 gani
 I want ... rounds for No. ... Ayieu ... irisasini le
 nambari ...

Wash these clothes, but do
 not put them in my box un-
 til they are quite dry.....Intukuo kona kelani kake
 mepek atua osanduku lai
 ometabanaa netoyu tokol

What sort of animal is it?....Kaa pukunoto engues nna?
 Has it a good head?.....Keeta elokonya sidai?
 Has it good horns?.....Keeta mouarak sidan?
 Has it a good mane?.....Keeta lpapet lolmelil sidan?
 Has it good tusks?.....Keeta lala sidan?
 Which is the best head?.....Kaa lokonya esidai?
 Are we likely to see a

better one?.....Aikitum sa ay sidai?
 Which way is the wind?.....Kaalo eyemo osiuo?
 Where did my bullet go?.....Kaji eyema orisasi lai?
 It went high.....Eyema shomata (or) eilepa
 It went low.....Eyema abori (or) etadoyie
 It went to the left.....Eyema kedianye
 It went to the right.....Eyema tatene
 It went underneath.....Etulutoyie
 It went over.....Etalanga
 Where was it hit?.....Kaji etangoroki?
 Was it badly wounded?.....Ketasesekuanake oleng?
 Is the blood dark red or
 light red?.....Kerok osarge anaa kenyokie?
 Follow the blood spoor but do
 not speak.....Tosoja orrekie losarge
 kake mero

Is it lung blood or heart
 blood?.....Kosarge lolkipieu anaa
 kololtaw?
 Is there froth on the blood?...Ketii olairampai osarge?
 If you see it, be quiet
 and point only.....Tenedol tegerayu tooto
 ake tolkimojino

I want the tenderloin, kidneys,
and liver.....Ayieu oloroo olairakuj
wemoinyua
The men may have the rest.....Eidem ltongana aawayta
nkulie
Make the cut along the
backbone.....Ntorobare endungoto oloito
lengoriong
Do not cut the head skin along
the neck underneath.....Midung olchoni lelokonya
temurt
That is not long enough.....Mmeedo naaidep
That is too long.....Eado nna oleng
That is too short.....Dorrop nna oleng
Bring knives and sharpening
stones.....Yao ngalema onkiito
Bring ... pounds of salt.....Yao ... orrantili le shumpi
What is the Swahili for ...?..Ainyoo Kiswaili ...?
This is most important.....Kitok ele rorei oleng
Be very careful.....Tabarake oleng
Take care not to damage it.....Tabarake minyial
Take care not to cut the skin..Akete midung olchoni
Take care to clean it
thoroughly.....Akete pee intuku oleng
Call me (or waken me) atMpotoki nano (or nyeyileki)
te ...
Have everything ready
overnight.....Ntobera ntokitin pooke
tenkewarie emetabayke
Can they smell us from here?...Keidem aainguai iylook
tene?
Can they see us from here?....Keidem aatodol iylook tene?
Can they hear us from here?...Keidem aatoning iylook tene?
Is it a male or female?.....Kolee anaa kelepong?
Where are my field glasses?...Koree turubeni aainei?
How many ... have you
brought?.....Kaja ... leyaua?
Who is this?.....Aingay ele?
I want only ...; nothing else..Meekure ayieu toki
How many ... are there?.....Kaja ... naatii idie?
Meet me over there.....Tangamuake nano teidie
Send ... men to the other end
and drive the ... toward.....Rrewai ... ltongana idia-
alo meipirie ... ene

- The men must keep in line
and walk slowly.....Ejeng ltongana olkereri
nepuo akete
- They may talk quietly but
they must not shout.....Eidem aairoro akete kake
nebuak
- Drive the ... as if you were
herding sheep, toward us.....Terewo ... anaa oloirreta
ntare, enikitii
- Get between the ... and the ...
and give ... your wind.....Totona tereshata ... o ...
nencho ... pee etum
olngusil linyi
- If he looks up, be quite still.Teneingor shomata
nenterrenga
- Lie still until his head
goes down.....Rraga ometabanaa neirrug
endokoya
- You must crawl and take
cover behind every bush.....Yopeyopari agelaakong
toonkeek pooke
- Which is the windward side?....Kaalo eito osiuo?
- Which is the leeward side?....Kaalo eniaabori tosiuo?
- Build a blind.....Ntobera emitet
- Where we can hide and
take photos.....Kaji kisudoriye pee
kiosh pisha
- When will you be ready?.....Kanu ade enapa?
- When will it be ready?.....Kanu ade eidepayu?
- How old is this track?.....Aimusana ena garri abaa?
- How old are these droppings?...Ainianu kona modiok?
- The animal is getting stronger.Keponaa engolon ena ngues
- The animal is recovering
from his wounds.....Keishiu ena ngues eneya
- The animal is getting weaker
and will soon lie down.....Kemenayu engues pee eirrag
- It is useless going further....Pesho kipuo dokoya
- Bring a light.....Yao eqangan (or) yao
olkelangelanget
- Keep the light out of my
eyes; it dazzles me.....Iwuangle ewangan
tongonyekaainei; amo kaar
- Fix the kill so we can
approach it under cover.....Rragie empopong pee kitum
aatenyekakinyie

- Do not cut a straight path
through the bush.....Midung engoitoi naitoriori
ayem entim
- So that the lions may not
see us as we approach.....Pee medol iylook lngatunyo
tenekenyekake
- Hang up the kill so that
hyenas cannot get it.....Teeka empopong pee metum
lngojinia
- Hang up the kill so that
hyenas can get only half.....Teeka empopong pee etum
lngojinia ainsa enkete
wueji
- Hang up the kill so that they
must jump-to bite it.....Teeka empopong pee etum
aayedake
- Skin the animals altogether
and keep the leg bones.....Teyianga inguesi pooke
neshom iloik loonkejek
- Take off the head skin only....Teyiengu olchoni lelokonya
ake
- I wish to keep the head.....Ayieu nashom endokoya
Keep the head and horns for me.Toshomakake endokoya
omouarak
- I do not want to keep the
head.....Mayieu nashom endokoya
- Take this ... into the shade
before starting to skin.....Ewa ena ... atua oloip
eton eito eyiengi
- Open along the belly and
remove the entrails.....Tadanya engoshoke nentayui
suut pooke
- Be careful not to cut the
entrails.....Tabarake midung isuut
engoshoke
- Be careful not to get blood
on the skin.....Tabarake mejeng olchoni
osarge
- Keep the lucky bones.....Rragie loik oomonyak
- Skin the paws with the
claws left on.....Teyiengu ndapi oloisotok
tiaatua
- Put water in the skull and get
the brains out with a stick..Tepeka engare elokonya
nentayu oloipernyen
tenchata

Split the skull and give the

brains to the cook.....Mperra elokonya nencho
oloipernyeney olayiarani

Sharpen my knife.....Iyiyio engalem ai

Sharpen my knife for me.....Iyiyiokoki engalem ai

We will move to another place..Kendor aapuo ay wueji

We have been here many days....Kitobiko tene ngolongi
kumok

Strike the tents at early dawn.Tadotu yemai tengakenya

Count up all the loads.....Nkena lolan pooke

We have been very lucky.....Ketomonyana ashi

We have had bad luck.....Etoasho ashi yiook otilo
otolo

Sickness

What is the matter with you?...Ainyoo entorronei teyie?

Where is the pain?.....Kaji neme?

I have pain all over my body...Aaya asesen pooke

I feel cold.....Aning enkiyape

I feel very sick.....Aning ajo aseja oleng

I am dizzy.....Aamanaa endokoya

I have no strength.....Maata engolon

I cannot eat anything.....Maydem ainosa toki

I cannot sleep.....Maydem airorayu

How long have you been ill?...Aingolongi aja anaa
netamuiyia?

I have been ill a long time....Atamuiyia ngolongi kumok

I have a fever.....Aata olirobe

Put out your tongue.....Ntaraso olngajep lino

This medicine will make you

sleep.....Kencho ele shani injo

Do not pretend to be ill.....Mintaakuno imuoi

Drink hot tea.....Tooko shaa! nairoua

You will perspire.....Pee kjaar enkema

If you perspire, you will

feel better.....Amo tenikjaar, enkema
nisupatu

Go and call a doctor at once...Shomo mpoto olabaani
nabokata

This baby has sore eyes.....Eata ena kerai enkeeja
onkonyek

Wash them every morning with

this medicine.....Soja anaake tadekenya
tele shani

Altogether.....	Tenebo
Always.....	Anaake
And.....	O (or) we
Animal.....	Engues
Ankle.....	Emurt enkejo
Anklet.....	Ngalolongani emonge
Another.....	Ay
Answer (n.).....	Ewalata
Answer (v.).....	Toola
Antelope.....	Engopera
Anthill.....	OlkIU
Ants (flying).....	Lketente
Ants (small black).....	Ngalao
Ants (warrior).....	Laisoyosoy
Ants (white).....	Oriri
Anything.....	Pooke toki
Aperient.....	Olchani odopesho
Approach.....	Anyeko
Arise.....	Inyo
Armlet.....	Olkataar
Arrive.....	Abayke
As.....	Anaa
Ashes.....	Nkuruon
Ashore.....	Keshewaine
Ask.....	Nkilikwano
At.....	Te
At once.....	Nabokata
Automobile.....	Emotokaa
Ax.....	Entolu
Baby.....	Enkerai kete
Back (n.).....	Siadi, orlong
Backbone.....	Enteyani (or) engotiong
Bacon.....	Nkiri olbitir
Bad.....	Torrano
Badly.....	Tentorrani
Bag.....	Olbene
Bake.....	Rouajie
Bamboo.....	Olteyani
Banana plant.....	Lmariko
Bank.....	Embenki
Baobab.....	Olmesera
Basin.....	Olbakuli
Basket.....	Embene
Bat (flying).....	Enagor-kewan
Bath.....	Eneisojareki

Be careful.....	Tabarake
Bead.....	Sayen (or) lpumpui
Beat.....	Toosho
Beautiful.....	Eikishiaan (or) sidai
Become.....	Aako
Bed.....	Erruat
Bee.....	Olotoroki
Beef.....	Inkiri enketong
Beetle.....	Olmolilaa; Lmolilak (pl.)
Before (place).....	Teidlaalo
Before (time).....	Tedokoya
Begin.....	Ntero
Behind.....	Tesiadi
Believe.....	Tonyorrai (or) iruko
Belly.....	Engoshoke
Best.....	Sida
Between.....	Tereshata
Big.....	Sapok (or) kitok
Bird.....	Emotonyi
Bit (bridle).....	Endungoti
Blade of spear.....	Esepel-e-mpere
Blanket.....	Olmiranketi
Blind.....	Modooni
Block (up).....	Olkeperrati
Blood.....	Osarge
Blotting paper.....	Engadasa
Blunt (unsharp).....	Mingani
Board.....	Embao
Boat.....	Empout
Body.....	Osesen
Boil (n.).....	Enkirouajata (or) eyilarata
Boil (v.).....	Irouajie
Bolt.....	Olkikenet
Bone.....	Oloito
Boot.....	Nnamoka
Bore (v.).....	Tuudo
Bottle.....	Oltupa
Bowl.....	Olbakuli
Box.....	Osanduku
Boy.....	Engayioni
Bread.....	Emokate
Break.....	Ereshat
Breakfast (n.).....	Endaa engakenya
Breakfast (v.).....	Anya endaa engakenya
Breast.....	Olgoo

Breed (v.)	Taramata (or) ntotio
Brick	Olboroi lesarngab
Bridge	Osagam
Bridle	Enkidonget oolpayek
Bring	Yao
Broken	Agela
Be broken	Etegele
Brown	Ngiro
Brush (n.)	Emburashi
Brush (v.)	Taara te mburashi
Bubble (n.)	Olaborra
Bubble (v.)	Eitootuua
Buffalo	Olarro
Bug	Engoongoni
Building (n.)	Enesheta (or) enchetata
Bull	Oloingone
Bullet	Orisasi
Burn (v.t.)	Tapejo
Bush (scrub)	Osanag
Bushbuck	Olpuua
Business	Enyamali
Busy (v.)	Enyamal
Busybody	Olonyamal (or) engayioni nanyamal
But	Kake
Butter	Engorno
Butterfly	Osampur-umpuri
Button	Inkisunguu
Buy	Inyilango
Cake	Keik
Calendar	Ngolongi olapa
Calf	Engashe
Call (v.)	Impoto
Camel	Entames
Camp	Engampi
Cannot be done	Meidemayu
Card (labor)	Olkepaaret
Cards (playing)	Enkeshui
Care	Embarakinoto
Carefully	Tembarakinoto
Carpenter	Olaguatani
Carrier	Olanapani
Carry	Tanapa
Cat	Empaka
Cattle	Nchoo

Center.....	Empolos (or) eneitorit
Chain.....	Olpisiai
Chair.....	Olorika
Change (n. and v. money)....	Tegela mpesai
Change (v. articles).....	Mbelekenya
Charcoal.....	Nkuk
Cheap.....	Elelek
Cheat.....	Teleja
Cheek.....	Entakola
Cheese.....	Enkurriny e kole
Chest (of body).....	Olgoo
Child.....	Enkerai
Circle.....	Emanaroto (or) lekelel
Claws.....	Iloisotok-loonguesi
Clean (adj.).....	Eisoja
Clean (v.).....	Soja
Clear away.....	Isiajaiyie
Clerk.....	Olkaraniy
Close (v.).....	Ntataana, nkeno, (or) ntenyeko
Cloth.....	Engarasha
Clothes.....	Ngarash
Cloud.....	Engatampo; Engatampo (pl.)
Coast.....	Keshewaine
Coffee.....	Shaa1
Cold.....	Eirobe (or) eideem
Color.....	En-gotoo
Come.....	Ou
Come in.....	Ou aji
Commence.....	Ntero
Complain.....	Aingonyongony
Completely.....	Tokol (or) enasepa
Condition.....	Lomon ngejuko einaikununo
Cone.....	Enkurma e ngano
Confusion.....	Enyamali
Consider.....	Tadamo
Contents.....	Naatii
Cook (n.).....	Olayiarani
Cook (v.).....	Teyiara
Cookery.....	Eyiarare
Cooking pot.....	Emoti nayierishoreki
Cool.....	Eirobe (or) eideem
Copy.....	Ntamaaya
Corner.....	Olpejata (or) enkutoto
Cost (n.).....	Enkinyanga

Cost (what does it?).....	Inosie (ainyoo inosie?)
Count up.....	Nkena
Country (nation).....	Enkop (or) olosho
Cover (n.).....	Empisingie
Cover (v.).....	Tupukuro
Cow.....	Enketeng
Cowshed.....	Olale lonkishu
Crawl.....	Ayopeyopari (or) agelaakong
Cream.....	Engorno (or) engapiana
Crocodile.....	Olkenos
Crooked.....	Ekorenya
Crops.....	Nkekesat (or) empew
Cross (v.) (over).....	Adung (or) alang
Crossing (n.).....	Elangata
Crow (v.).....	Aimudumudie
Crowbar.....	Atur (or) airem
Cultivator.....	Olaturoni
Cup.....	Enkekompe
Curve.....	Aluaa
Customs house.....	Olengoti
Damage (n.).....	Arruoyo
Dance.....	Osingolio
Dark (n.).....	Enaimen
Daughter (or young girl)...	Eselengei (or) entito
Dawn.....	Engakenya (or) enasirie
Day.....	Endama (or) dama
Dead.....	Eye, etua
Deep gorge.....	Olashepani
Deep water.....	Engare nagut
Dik-dik.....	Erongo
Dine.....	Anya
Dinner.....	Endaa enteipa
Dirty.....	Eata oloirerio
Dish (n.).....	Esihiyia
Dish up.....	Tooro endaa
Dismantle.....	Agela (or) awurori
Disturb.....	Aitanyamal
Dizzy.....	Olongorlokonya
Do.....	Aas
Doctor.....	Olabaani
Dog.....	Oldia
Donkey (male).....	Osikiria (or) olamoye
Door.....	Kotokaji
Down.....	Abori

Drain (n.)	Embuket
Drain (v.)	Abuku
Draw near	Anyeko
Draw water	Awoku engare
Drink (n.)	Ewoked
Drink (v.)	Awok
Drive (v.)	Amer (or) arew
Drop (n.)	Olketongati
Drop (v.)	Ntongake (or) ntadoika
Dry	Etoyio
Dust (n.)	Enterit
Dust (v.)	Ajut enterit
Duster	Enjutet
Dutiable	Aalaake
Each	Maanabo
Ear	Enkipok
Early	Ayooki
Earring (for men)	Olmiintoi; Lmiintoni (pl.)
Earth (ground)	Nkulukuok
Eat	Anya
Egg	Olmosori
Eight	Isiet
Eighteen	Tomon oisiet
Eighty	Ntomonisiet
Eland	Osirua
Elbow	Oloidolol
Elephant	Olkanchaoi
Eleven	Tomon obo
End	Enkitingoto
Enemy	Olmangatinta
Enough	Eidep
Enter	Ajeng
Entrails	Isuut engoshoke
Envelope	Embene oompala
Essence	Empew teyinoto
Evening	Teipa
Every	Pooke
Everything	Pooke toki
Everywhere	Pooke wueji
Excuse (v.))	
Excuse me)	Tapalakake
Expectorate	Anoto ngamolak
Extract (tooth)	Tadotu (olalay)
Eye	Engongo; Ngonyek (pl.)
Face (n.)	Engomom

Face (v.).....	Ngorake
Fair (just).....	Erisio
Fall (n.).....	Esulunoto
Fall (v.).....	Abatata
Famine.....	Olomeyu
Farewell!	Sere!
Farm.....	Enkurma
Fat (n.).....	Eyelata
Fatten (humans or animals).....	Epir
Fault.....	Enketarruoroto
Feed.....	Ntotio
Feel.....	Ininingo
Female.....	Elepong
Fence (n.).....	Esita
Fever.....	Oloirobe
Few.....	Kote
Field glasses.....	Turubeni (Swahili)
Fifteen.....	Tomon omiet
Fifth.....	Enemiet
Fifty.....	Onom
Fill.....	Mpota
Filter.....	Enjiet
Find.....	Ngoro
Finger.....	Olkimojino
Fingernail.....	Oloisotoo
Finish.....	Ndepa
Fire (n.).....	Enkema
Firewood.....	Lkeek
First.....	Nabo (or) enedokoya
Fish.....	Senger
Fit in.....	Iririki
Five.....	Imiet
Flavoring.....	Emeloni
Flea.....	Olpedelai (or) lloisusu
Flour.....	Enkurma
Flower.....	Entapokai
Fly.....	Olojongani
Fold.....	Tununuko
Follow.....	Tosoja
Food.....	Endaa
Foot.....	Enkejo
For.....	Tengarake
Foreman.....	Olarikoni
Forest.....	Entim
Forget.....	Arikino

Forgive.....	Tapalakake
Form (n.).....	Enyanyukie
Forty.....	Artam
Four.....	Onguan
Fourteen.....	Tomon onguan
Fourth.....	Enlonguan
Fowl.....	Ntaritik; Imotonyi (pl.)
Fraction.....	Endungoti
Framework.....	Aitorisioki
Frequently.....	Anaake
Fresh (another).....	Ay
Fresh (new).....	Ngejuk
Friday.....	Engolong enaapishana
Friend.....	Olchore
Frog.....	Entuaa
From.....	Ainguaa (or) aleku
From (since).....	Ebayke
Front.....	Dokoya
Froth.....	Olaborra
Fruit.....	Olnganayioi
Full.....	Ebore
Full (satisfied).....	Eidep
Furniture.....	Ntokitin eaji
Further.....	Elakua
Ganger (overseer).....	Olaingorani
Gate.....	Kishomi
Gauge.....	Enchata olkererin
Gently.....	Akete (or) abarake
Get.....	Atum
Giraffe.....	Olmeot
Girth (saddle).....	Enkeene
Give.....	Nchoo
Go.....	Shomo
Goat.....	Enkine
God.....	Engai
Good.....	Sida1
Goodbye.....	Sere
Gourd.....	Olkukuri
Gradually.....	Maakotete
Grasshopper.....	Entargeeti; Ntargeet (pl.)
Grate (v.).....	Ayutuyut (or) aoju
Graze.....	Airreta (or) aingor
Grazing ground.....	Engalo nairritishoreki
Grease (v.).....	Iyelie
Great.....	Sapok (or) kitok

Griddle.....	Enkidonget
Ground (earth).....	Nkulukuok
Grow (persons or plants)...	Abolo
Grow (planting).....	Aitobolo
Guard (n.).....	Olarripioni
Guard (v.).....	Airreta, arrip, (or) aingor
Guinea fowl.....	Olkeresure
Gun.....	Entiol
Hair.....	Olpapeta; Lpapet (pl.)
Half.....	Olpisiai oitorit
Hammer (n.).....	Oringa
Hammer (v.).....	Toosho toringa
Hand.....	Engayna
Handle (n.).....	Enkebongata
Hang (on wall).....	Ayek (tesontai)
Hang up.....	Teeka
Happiness.....	Enchepai
Hard.....	Egol
Hare.....	Enkitojo
Harvest (n. and v.).....	Aikes ngaytobolo
Have.....	Aata
He.....	Nenye
Head.....	Elokonya
Headman.....	Oltongani lelokonya
Health.....	Embiotisho
Hear.....	Aning
Heart.....	Oltaw
Heavy.....	Eiroishi
Heel.....	Entutunyo
Heifer.....	Olashe
Herd (n.).....	Emboo, olturrur, (or) loonkishu
Herd (v.).....	Airreta (or) aingor
Here.....	Ene
Hide.....	Aisudoo
High.....	Shomata
Hippopotamus.....	Olmakaw
Hit.....	Aosh
Hole.....	Engumoto
Hole (in ground).....	Atur
Honey.....	Enaisho
Hook (peg).....	Isotunot
Horn.....	Emouc
Horse.....	Embarta
Hot.....	Eiroua

Hotel.....	Olpul
Hour.....	Enkata
House.....	Engaji
How.....	Kaji eikununo
Hull.....	Tabolu, ayiolou, (or) tayiolo
Hundred.....	Ip
Hunger.....	Esumash
Hungry.....	Eisumash
Hunt.....	Engorore
Hyena.....	Olngojene
I.....	Nano
If.....	Tenaa
Ill.....	Emuoi
Ill (to be).....	Amuoyu
Impala.....	Ololubo
Impassable (road).....	Mmeyemayu
Important.....	Eningo, sapok, (or) kitok
In.....	Atua
Increase.....	Aponaa
Ingredient.....	Enatii (or) ncholakinot; Nnaatii (pl.)
Ink.....	Orangi
Inoculate.....	Aud tolchani
Inside.....	Atua
Into.....	Tiatua
Joy.....	Enchepai
Keep (guard).....	Ngora, taramata, (or) rreta
Keep (v.).....	Ngora, taramata
Key.....	Olbolet
Kidney.....	Olairakuji
Kill.....	Aar metua
Kind.....	Empukunoto
Kneel.....	Agelkong
Knife.....	Engalem
Know.....	Ayiolou
Known (be).....	Aaiyiolou
Lake.....	Olturoto
Lame.....	Ngojene
Lamp.....	Olkelangelanget
Large.....	Sapok (or) kitok
Late (be).....	Aimutie
Latter.....	Tesiadi
Laundry.....	Enkitukuore
Leaf.....	Embeneiyio

Leak.....	Awo
Learn.....	Ayiolou
Leave (permission).....	Orusa
Leaves.....	Mbenek
Leek.....	Enkitunguu
Leeward.....	Abori osiuo
Left (hand).....	Kedianye
Left (remain).....	Ainguaa (or) aleko
Leg.....	Enkejo
Length.....	Engadori
Leopard.....	Olouaru-keri
Letter.....	Empalai
Lie (n.).....	Elejare
Lie (v.).....	Alej
Lie down.....	Airrag
Lift.....	Adomo
Light (adj. and n.).....	Ewangan
Light (v.).....	Aitawang (or) ailangelang
Lightning.....	Enkiwuangata (or) endarata
Like (adj.).....	Tenaa
Like (v.).....	Anyor
Like (resemble).....	Enyanyukie
Line.....	Olkereri
Line up.....	Toosho olkereri
Lion.....	Olngatuny
Liquid.....	Eikare
Litter (dirt).....	Suut
Litter (v.).....	Ntarruoi
Little.....	Kete
Liver.....	Emoinyua
Lizard (garden).....	Ologelalem
Lizard (house).....	Olpur
Lizard (water).....	Olmayma
Load.....	Olola
Lock (n.).....	Enkikenet
Lock (v.).....	Aiken
Loin.....	Enkupes
Loiter.....	Aimutie
Long.....	Enaado
Look.....	Aingor
Loose.....	Aitololong
Lop.....	Adung
Lose.....	Aitorraa (or) aiminie
Lost.....	Eimena
Louse.....	Elashei

Luck.....	Monyaka (or) emonyani
Lucky.....	Emonyak
Lung.....	Lkipieu
Main.....	Kitok
Mainland.....	Enkop kitok
Maize (plant).....	Lpayek
Male.....	Olee
Man.....	Oltongani
Manage.....	Arikoo
Manners.....	Enganyet
Many.....	Kumok
Marabou stork.....	Entilagos
Market.....	Sokoni
Marsh.....	Ndanyat
Mash (n.).....	Endaa nakuro
Mash (v.).....	Arorony
Mason.....	Olkunoni
Master.....	Olkitok
Match.....	Enkibiriti
Matter (affair).....	Eikash
Matter (pus).....	Nkimek
Meaning.....	Tepat
Measure (n.).....	Enaitoris
Measure (v.).....	Aitoris
Meat.....	Nkiri
Medicine.....	Olmairo
Medicine (charm).....	Enaibon
Meet.....	Atumore
Mess.....	Entorroni
Method.....	Engoitoi, enkeemata, (or) emashangeshang
Midday.....	Enaipirie engolong
Milk.....	Kole
Minute (adj.).....	Kinyi
Minute (n.).....	Enkata
Miss (v.).....	Alau
Mistake.....	Aitarruoo
Mistress.....	Engoruoi
Mix.....	Aitoshol
Mixture.....	Nkiporjoporjat
Monday.....	Engolong euni
Money.....	Mpesai
Mongoose.....	Enkenya-nkiri
Month.....	Olapa
Moon.....	Olapa

More.....	Kulie alang
Morning.....	Tadekenya
Mortices.....	Nnaudot
Mosquito.....	Engojongani
Moth.....	Naiba osena
Mountain.....	Oldoinyio
Mouth.....	Engotok
Mucus.....	Olkuluk; Lkuluki (pl.)
Nail (finger).....	Oloisotoo
Nail (iron).....	Olmoshoma
Name.....	Engarna
Navel.....	Osororua
Near.....	Etaana (or) anyekake
Near (v.).....	Anyekake
Neck.....	Emurt; Imurto (pl.)
Need (n. and v.).....	Eyleunoto
Needle.....	Oltedo
Net.....	Olkuluk-lengojongani
New.....	Ngejuk
News.....	Llomon
Nice.....	Sidai (or) elkishiaan
Night.....	Kewarie
Nine.....	Naaudo
Nineteen.....	Tomon oudo
Ninety.....	Ntomoninaaudio
Ninth.....	Eenaudio
No.....	Aa
Noise.....	Oltolilo (or) ororei
Noon.....	Enaipirie engolong
Nose.....	Enkume
Not so.....	Mme neijia
Notes.....	Enoti ompesai
Nothing.....	Mme toki
Now.....	Taata
Number.....	Nambari
Obtain.....	Atum
Obtainable.....	Etumoyu
Ocean.....	Enaiposha
Office.....	Apisi
Officer.....	Oliapisi
Oil.....	Eyelata
Old (person).....	Olpayian
Old (worn out).....	Musana (or) etomote
On.....	Shomata
One.....	Nabo

Only.....	Ake
Or.....	Aasho
Orange (tree or fruit).....	Olmashunguai
Ostrich.....	Esidai
Ought.....	Enyor (or) enarikino
Over.....	Shomata
Overnight.....	Metabayke kewarie
Owl.....	Emotonyi-onkiyiaa
Oxhide.....	Olchoni
Padlock.....	Enkikenet
Paint (n.).....	Orangi
Paint (v.).....	Ayelle
Paper.....	Engardasi
Pardon (v.).....	Tapalakake
Partridge.....	Enkorlee
Pass.....	Etulusoyie (or) alusoo
Passable.....	Eyemayu
Patch.....	Erragerrag
Path.....	Engoitoi (or) emashangeshang
Paw (n.) (of a lion).....	Endap-olouaru
Paw (v.).....	Aroro tendap
Peace.....	Osotua
Peg (hat).....	Sotunot
Peg (hook).....	Isotunot
Peg (tent).....	Encheitoi
Pen (for fowl).....	Olale
Pen (shut up).....	Aiken
Pen (writing).....	Engalamu
Pepper.....	Pilipili
Per.....	Te
Perhaps.....	Einguaa
Period.....	Enkata
Permanent.....	Edopa, meidor, pooke kata, (or) abikoni
Price.....	Enkinyanga
Quarter.....	Enlonguan
Quickly.....	Tasioki
Quickly (at once).....	Nabokata
Quietly.....	Akete (or) abarake
Quite.....	Esepa
Rabbit.....	Enkitojo
Raid.....	Enjore
Rain (n.).....	Enchan
Rain (v.).....	Asha
Raise.....	Adomo

Rat.....	Enderoni
Rations.....	Endaa
Ready.....	Anapa
Real.....	Esepa
Recipe.....	Alikioo (or) ainosaa
Reckon (suppose).....	Anyorreke
Reckon up.....	Aitoshol
Recover.....	Aishiu
Red.....	Enyokie
Reduce.....	Aitongor
Registered (be).....	Aiger
Reign (n.).....	Enketoria
Reign (v.).....	Aitore
Remember.....	Tadamo
Remove.....	Aitayu (or) aidurrie
Require.....	Ayieu
Responsible (you are).....	Esiaai ino
Rest.....	Ayengeyenga
Rest (remainder).....	Naaleko
Rethatching.....	Ashet aitoki
Return.....	Ashuko
Rhinoceros.....	Emony
Ride.....	Aked
Right (correct).....	Neijia
Right (hand).....	Tatene
Rise (of sun) (n.).....	Enkilepunoto engolong
Rise (of sun) (v.).....	Ailepo
River.....	Olkejo
Road.....	Engoitoi (or) emashangeshang
Roast.....	Apej
Roughly.....	Pororongos (or) ainyial
Round.....	Lekel
Rub.....	Ajut
Rubble.....	Olkarkar
Rude.....	Awuasa
Run (of color).....	Ajia, aijujuka, (or) apuku emua
Run (run away).....	Aipirri (or) aisek
Runaway.....	Aisek
Rusty.....	Adoru
Saddle (n.).....	Oltonet lenchoni
Saddle (v.).....	Asesen te nchoni
Saddle girth.....	Enkeene
Safely.....	Teseriani

Salt.....	Shumpi
Sand.....	Osenyai
Sandal.....	Enamoke; Nnamoka (pl.)
Saturday.....	Engolong edokeya
Saucepan.....	Emoti
Saucer.....	Esaani
Say.....	Airo (or) ajo
Scorpion.....	Engolopa
Screw.....	Olmoshomaa
Scrub (n.).....	Osanag
Second.....	Eniare
See.....	Ngora
Seldom.....	Mme pooke kata
Sell.....	Toliki, tolimu, (or) amer
Send.....	Rrewai
Separately.....	Tooreworo
Servant.....	Osinga
Serve.....	Aasishore (or) aitobirishore
Serve up.....	Tooro endaa
Set (sun).....	Endoyioroto engolong
Seven.....	Naapishana
Seventeen.....	Tomon oopishana
Seventh.....	Enenaapishana
Seventy.....	Ntomoninaapishana
Severity.....	Empejan (or) engoro
Shade.....	Cloip
Sharp.....	Epe
Sharpen.....	Aitepej (or) ayiyi
Sharpen (pencil).....	Aguet
Sheep.....	Enker; Nkerra (pl.)
Shelf.....	Enaraa
Shift.....	Aje
Shilling.....	Enchilingi
Shirt.....	Enchatl
Shoe.....	Enamoke
Shout (n.).....	Embuaata
Shout (v.).....	Abuak
Show (v.).....	Aitodolo
Shrink.....	Aitololong
Sick (vomit).....	Alopesho
Sign.....	Lbolabol
Silence!	Tegerayu!
Silence (n.).....	Engera
Since.....	Ebayke
Sinew.....	Empito

Sit down.....	Totona tenkop
Six.....	Lle
Sixteen.....	Tomon oile
Sixth.....	Eneile
Sixty.....	Ntomonile
Skin (n.).....	Olchoni
Skin (v.).....	Ayiong
Skull.....	Oloito lelokonya (or) emborbor
Sky.....	Engenai (or) engai
Small.....	Kete
Smell (n.).....	Olngusil
Smith (black).....	Oloidongishoi (or) olkunoni
Smith.....	Olkunoni
Smoke.....	Empuruo
Smooth (adj.).....	Epuyiapui
Smooth (v.).....	Aitupuyiapui
Snake.....	Olasorai
Snap (break).....	Adungo (or) agela
Snuff.....	Enkesoge
Soak (clothes).....	Aitashal
Soap.....	Oloonkelani
Soda.....	Emakat
Soil (earth).....	Nkulukuok
Something.....	Toki (or) kete toki
Soon.....	Asioki
Sort.....	Empukunoto
Sort (what?).....	Aa (or) kaa?
Southern Cross.....	Lpayiani lolker
Speak.....	Erero
Spill.....	Mbukoki
Spirit level.....	Oltaw lenchata
Splinter.....	Oljepet
Split.....	Mperra
Spoon (table).....	Olkurtet
Spoon (tea).....	Enkijiko
Spoor (dung).....	Inkik (imodiok)
Spoor (tracks).....	Roruat (or) orrekie
Spot (dot).....	Olorika, oltipoti, (or) orashata
Spring.....	Enchorro
Stable.....	Engaji ombartan
Stable (sure).....	Asepo (or) aibalie
Stamp (tread on).....	Arero (or) atokony

Stand.....	Inyo
Stand-up.....	Ntasho
Stars.....	Llaker
Start (v.).....	Ntero
Steam.....	Ositima
Steer.....	Bongay
Stick.....	Enchata
Stick (walking).....	Engudi (or) entirmanet
Still (without moving).....	Aiterrenga
Still (yet).....	Eton-ake
Stir.....	Ngolengola
Stone.....	Osoit; Isoito (pl.)
Stony.....	Natii soito (or) olkarkar
Stool.....	Olorika
Stop.....	Ntasho (or) tapala
Store.....	Osingira (or) olperere
Stork.....	Inguesi
Stout.....	Sapok (or) kitok
Stove.....	Jikoni (Swahili)
Straight.....	Eitoriori
Strainer.....	Enjiet
Strong.....	Egol
Stump.....	Olengoti (or) ologol
Sugar.....	Esokari
Sun.....	Engolong
Sunday.....	Juma pili (Swahili)
Sunrise.....	Engakenya (or) enasirie
Sunset.....	Emutiy (or) enteipa
Swear (abuse).....	Adek (or) aimom
Swear (oath).....	Anya-olmonai
Sweat.....	Aar enkema
Swell.....	Ajeyu
Sword.....	Olalemi; Llalema (pl.)
Table.....	Emesa
Tablecloth.....	Engarasha emesa
Tablespoon.....	Olkurtet
Tail.....	Olkedongoy
Take.....	Aya
Tank.....	Embirika
Tea.....	Shaa1
Teacup.....	Enkekompeshaa1
Tear (v.).....	Topolosa
Teaspoon.....	Enkijiko
Teeth.....	Llala
Telegram.....	Esimu

Tell.....	Ajoki (or) aliki
Ten.....	Tomon
Tent.....	Eyema
Tenth.....	Enetomon
Thank.....	Ashuku enashe
Thanks.....	Nnashei
Thank you.....	Ashé
Thatch.....	Ashet
Then.....	Tengay
There.....	Teine (or) idie
These.....	Kona
Thick.....	Eirrosha
Thickness.....	Enkerrosha1
Thin.....	Ronga1
Think.....	Tadamo
Third.....	Eneuni
Thirsty.....	Aata enkore
Thirteen.....	Tomon ookuni
Thirty.....	Tomon iuni
Thorn.....	Olkikwei; Lkeko (pl.)
Thoroughly.....	Enasepa (or) tokol
Thousand.....	Ip Tomon
Three.....	Uni
Throat.....	Olgos; Lgoso (pl.)
Throw.....	Tananga1
Thunder.....	Enkikurrukur
Thursday.....	Alhamisi (Swahili)
Tick.....	Olmasher1
Tighten.....	Tokorrake
Tightly (hold).....	Akorrakino
Till.....	Ometaba
Timbers.....	Olchani
Time.....	Enkata
Tiny.....	Kinyi
To.....	Te
Toast.....	Apej
Tobacco.....	Olkumpau
Tobacco pipe.....	Olmoti
Today.....	Duo-taata
Toe.....	Olkimojino lenkejo
Together.....	Tenebo
Tomato.....	Lnyanya
Tomorrow.....	Metabayke (or) taaisere
Tongue.....	Olgejep
Tool.....	Enaret

Toolshed.....	Olale leboo
Tooth.....	Olalay
Tortoise.....	Oloikuma
Toward.....	Aipirie
Track.....	Engoitoi (or) emashangeshang
Tractor.....	Olbeleleng
Trade (n.).....	Emerare
Trade (v.).....	Ameresho
Troublesome.....	Aitanyamalesho
Tuck in.....	Tepeka atua
Tuesday.....	Engolongeonguan (or) jumanne (Swahili)
Turn.....	Aibelekeny
Turned (be).....	Aibelekenya
Twelfth.....	Enetomon oare
Twelve.....	Tomon oare
Twenty.....	Tikitam
Two.....	Are
Typewriter.....	Engarri naigerishoreki (or) enaigerishoreki
Udder.....	Enyewa
Umbrella.....	Olmampuli
Under.....	Tiabori
Underneath.....	Tiabori
Understand.....	Aningu
Unfasten.....	Alak
Until.....	Ometaba
Upright.....	Aitoriori
Use (v.).....	Aasishore (or) aitobirishore
Useless.....	Pesho
Utensils.....	Ndaareta
Valley.....	Oyarata
Valuable.....	Eata tepat
Vegetables.....	Mboga (Swahili) (or) ngaytobolo
Very.....	Oleng
Very early morning.....	Enasirie tadekenya
Vest.....	Esulana
Vinegar.....	Engampu
Visitors.....	Llomon
Vomit.....	Alopesho
Vulture.....	Olkorrags
Wages.....	Llaakinot (or) olmoshaara
Wagon.....	Engarri
Wait.....	Aanyo

Walk (exercise).....	Aas esiaai (or) alo amoku
Walk (go afoot).....	Alo toonkejek
Wall.....	Esontai
Want (desire).....	Eyleunoto (or) esera1
Want (n.).....	Eyleunoto
Want (need) (v.).....	Ayleu
Warrior.....	Olmorran1
Wash (clothes).....	Aituku
Wash (hands).....	Aisoj
Water.....	Engare
Weak.....	Eshal
Weeds.....	Lkeko
Week.....	Ewik1
Weight.....	Enkiroiishi
Well (adv.).....	Aisida1 (or) sida1
Well (n.).....	Esidano
What?.....	Ainyoo?
Wheat.....	Ngano
Wheel.....	Enkejo engarri
Where?.....	Aji? (or) kaj1?
Which?.....	Aa?
While.....	Tenkata
Whisker.....	Olmunye1
Whisper.....	Angomake
White.....	Eibor
Whites of egg.....	Nkepa olmosori
Whole.....	Pooke
Whose?.....	Kenengay?
Wick.....	Entampi
Widow.....	Engolia1
Win.....	Aisulu
Wind (n.).....	Osiuo
Wind (v.).....	Apeyay
Windward.....	Engalo naito osiuo
Wing.....	Enaipuko1
Wire (copper, brass).....	Osoyai
Witness.....	Shaken1
Wizard.....	Olkoyantiki; Lkoyantek (pl.)
Wolf.....	Osuyiani
Wooden earring.....	Enkulale; Nkulalen (pl.)
Work (n.).....	Esiaai
Work (v.).....	Aasesho
Workman.....	Olaasani lesiaai; Laasak lesiaai (pl.)
World.....	Sewsew

Wound (n.).....	Empaldaka
Wound (v.).....	Asesekwan
Yaws.....	Lpepedo
Year.....	Olari
Yesterday.....	Ngole
You.....	Iyie
Young.....	Ote, kete, (or) enana
Your.....	Enino
Zebra.....	Oloitiko

MASAI-ENGLISH VOCABULARY

Masai	English
Aa.....	No
Aa?.....	Which?
Aa?.....	(What) sort?
Aaiyiolou.....	Known (be)
Aako.....	Become
Aalaake.....	Dutiable
Aanyo.....	Wait
Aar enkema.....	Sweat
Aar metua.....	Kill
Aas.....	Do
Aas esiaai.....	Walk (exercise)
Aasesho.....	Work (v.)
Aasho.....	Or
Aasishore.....	Serve; use (v.)
Aata.....	Have
Aata enkore.....	Thirsty
Abarake.....	Quietly, gently
Abatata.....	Fall (v.)
Abayke.....	Arrive
Abikon1.....	Permanent
Abolo.....	Grow (persons and plants)
Abor1.....	Down
Aboriosiuo.....	Leeward
Abuak.....	Shout (v.)
Abuku.....	Drain (v.)
Adek.....	Swear (abuse)
Adomo.....	Lift, raise
Adoru.....	Rusty
Adung.....	Lop; cross (v.) (cross over)
Adungo.....	Snap (break)
Agela.....	Broken (v. neut.), dismantle, snap

Agelaakong.....	Crawl
Agelkong.....	Kneel
Aguet (enkalamu).....	Sharpen (pencil)
Aibalie.....	Stable (sure)
Aibelekeny.....	Turn
Aibelekenya.....	Turned (be)
Aidurrie.....	Remove
Aigel.....	Again
Aiger.....	Registered (be)
Aiken.....	Lock (v.); pen (shut up)
Aikes ngaytobolo.....	Harvest (n. and v.)
Ailangelang.....	Light (v.)
Ailepo.....	Rise (v.) (of the sun)
Aiminie.....	Lose
Aimom.....	Swear (abuse)
Aimudumud.....	Crow (v.)
Aimutie.....	Late (be)
Aingonyongony.....	Complain
Aingor.....	Look, graze, guard (v.), herd (v.)
Ainguaa.....	From, left (remain)
Ainosaa.....	Recipe
Ainyial.....	Roughly
Ainyoo?.....	What?
Aipirie.....	Toward
Aipirri.....	Run, run away
Airem.....	Crowbar
Airo.....	Say
Airrag.....	Lie down
Airreta.....	Graze, guard (v.), herd (v.)
Aisek.....	Runaway, run, run away
Aishiu.....	Recover
Aisida1.....	Well (adv.)
Aisoj.....	Wash (hands)
Aisudoo.....	Hide
Aisulu.....	Win
Aitanyamal.....	Disturb
Aitanyamalesho.....	Troublesome
Aitarruoo.....	Mistake
Aitashal.....	Soak (clothes)
Aitawang.....	Light (v.)
Aitayu.....	Remove
Aitepej.....	Sharpen
Aiterrenga.....	Still (motionless)
Aitobirishore.....	Serve, use (v.)

Aitobolo.....	Grow (planting)
Aitodolo.....	Show (v.)
Aitoki.....	Again
Aitololong.....	Loose, shrink
Aitongor.....	Reduce
Aitore.....	Reign (v.)
Aitoriori.....	Upright
Aitoris.....	Measure (v.)
Aitorisioki.....	Framework
Aitorraa.....	Lose
Aitoshol.....	Mix, reckon up
Aituku.....	Wash (clothes)
Aitupuyiapui.....	Smooth (v.)
Aje.....	Shift
Ajeng.....	Enter
Ajeyu.....	Swell
Aji?.....	Where?
Ajia.....	Run (of color)
Ajo.....	Say
Ajoki.....	Tell
Ajut.....	Rub
Ajut enterit.....	Dust (v.)
Ake.....	Only
Aked.....	Ride
Akete.....	Quietly, gently
Akorrakino.....	Tightly (hold)
Alak.....	Unfasten
Alang.....	Cross (v.) (cross over)
Alau.....	Miss (v.)
Alej.....	Lie (v.)
Aleko.....	From, left (remain)
Alhamisi (Swahili).....	Thursday
Aliki.....	Tell
Alikioo.....	Recipe
Alo amoku.....	Walk (exercise)
Alo toonkejek.....	Walk (go afoot)
Alopesho.....	Sick (vomit)
Aluaa.....	Curve
Alusoo.....	Pass
Amer.....	Drive (v.)
Ameresho.....	Trade (v.)
Amuoyu.....	Ill (to be)
Anaa.....	As
Anaake.....	Always, frequently
Anapa.....	Ready

Angomake.....	Whisper
Aning.....	Hear
Aningu.....	Understand
Anoto ngamolak.....	Expectorate
Anya.....	Dine, eat
Anya endaa engakenya.....	Breakfast (v.)
Anya-olmoma1.....	Swear (oath)
Anyekake.....	Near, near (v.)
Anyeko.....	Approach, draw near
Anyor.....	Like (v.)
Anyorreke.....	Reckon (suppose)
Aoju.....	Grate (v.)
Aosh.....	Hit
Apej.....	Roast, toast
Apeyay.....	Wind (v.)
Apisi.....	Office
Aponaa.....	Increase
Apuku emua.....	Run (of color)
Apuku orang1.....	Run (of color)
Are.....	Two
Arew.....	Drive (v.)
Arikino.....	Forget
Arikoo.....	Manage
Aroro.....	Stamp (tread on)
Aroro tendap.....	Paw (v.)
Arorony.....	Mash (v.)
Arrip.....	Guard (v.)
Arruoyo.....	Damage (n.)
Artam.....	Forty
Asepo.....	Stable (sure)
Asesekwan.....	Wound (v.)
Asesen te nchoni.....	Saddle (v.)
Asha.....	Rain (v.)
Ashé.....	Thank you
Ashet.....	Thatch
Ashet aitoki.....	Rethatching
Ashuko.....	Return
Ashuku enashe.....	Thank (v.)
Asioki.....	Soon
Atokony.....	Stamp (tread on)
Atua.....	In, inside
Atum.....	Get, obtain
Atumore.....	Meet
Atur.....	Crowbar, hole (in ground)
Aud tolchani.....	Inoculate

Aure.....	Afraid
Awo.....	Leak
Awok.....	Drink (v.)
Awoku engare.....	Draw water
Awuasa.....	Rude
Awurori.....	Dismantle
Ay.....	Fresh, another
Aya.....	Take
Ayek (tesontai).....	Hang (v.) (on wall)
Ayelle.....	Paint (v.)
Ayengeyenga.....	Rest
Ayieng.....	Skin (v.)
Ayieu.....	Require, want (need)
Ayiolou.....	Know, learn, hull
Ayiyi.....	Sharpen
Ayooki.....	Early
Ayopeyopari.....	Crawl
Ayutuyut.....	Grate (v.)
Bongay.....	Steer
Dama.....	Day
Dokoya.....	Front, ahead
Duo-taata.....	Today
Eata oloirerio.....	Dirty
Eata tepat.....	Valuable
Ebayke.....	From (since)
Ebore.....	Full
Edopa.....	Permanent
Egol.....	Hard, strong
Eibor.....	White
Eideem.....	Cold, cool
Eidep.....	Enough, full (satisfied)
Eidepe.....	Already
Eikare.....	Liquid
Eikash.....	Matter, affair
Eikishiaan.....	Beautiful, nice
Eimena.....	Lost
Einguaa.....	Perhaps
Eirobe.....	Cold, cool
Eiroishi.....	Heavy
Eiroua.....	Hot
Eirrosha.....	Thick
Eisoja.....	Clean (adj.)
Eisumash.....	Hungry
Eitootuaa.....	Bubble (v.)
Eitoriori.....	Straight

Ekorenya.....	Crooked
Elakua.....	Further
Elangata.....	Crossing (n.)
Elashei.....	Louse
Elejare.....	Lie (n.)
Elelek.....	Cheap
Elepong.....	Female
Elokonya.....	Head
Emakat.....	Soda
Emanaroto.....	Circle
Emashangeshang.....	Path, method, road, track
Embao.....	Board
Embarakinoto.....	Care
Embarta.....	Horse
Embene.....	Basket
Embene oompala.....	Envelope
Embeneiyio.....	Leaf
Embenki.....	Bank
Embiotisho.....	Health
Embirika.....	Tank
Emboo.....	Herd
Emborbor.....	Skull
Embuaata.....	Shout (n.)
Embuket.....	Drain (n.)
Emburashi.....	Brush (n.)
Eme.....	Ache
Emeloni.....	Flavoring
Emerare.....	Trade (n.)
Emesa.....	Table
Emoinyua.....	Liver
Emokate.....	Bread
Emony.....	Rhinoceros
Emonyak.....	Lucky
Emonyani.....	Luck
Emoti.....	Saucepan
Emoti nayierishoreki.....	Cooking pot
Emotokaa.....	Automobile
Emotonyi.....	Bird
Emotonyi-onkiyiaa.....	Owl
Emouo.....	Horn
Empaka.....	Cat
Empalai.....	Letter
Empaldaka.....	Wound (n.)
Empejan.....	Severity
Empew.....	Crops

Empew teyinoto.....	Essence
Empisingie.....	Cover (n.)
Empito.....	Sinew
Empolos.....	Center
Empout.....	Boat
Empukunoto.....	Kind, sort
Empuruo.....	Smoke
Emuoi.....	Ill
Emurt.....	Neck
Emurt enkejo.....	Ankle
Emutiy.....	Sunset
Enaado.....	Long
Enagor-kewan.....	Flying bat
Enalbon.....	Medicine (charm)
Enalgerishoreki (engarri).....	Typewriter
Enaimen.....	Dark (n.)
Enaipirie engolong.....	Noon, midday
Enaiposha.....	Ocean
Enaipukoi.....	Wing
Enaisho.....	Honey
Enaitoris.....	Measure (n.)
Enamoke.....	Shoe, sandal
Enana.....	Young
Enaraa.....	Shelf
Enaret.....	Tool
Enarikino.....	Ought
Enasepa.....	Thoroughly
Enasirie.....	Sunrise, dawn
Enasirie tadekenya.....	Very early morning
Enatii atua.....	Ingredient
Enchan.....	Rain (n.)
Enchata.....	Stick
Enchata olkererin.....	Gauge
Enchat1.....	Shirt
Encheitoi.....	Peg (tent)
Enchepai.....	Joy, happiness
Enchetata.....	Building (n.)
Enchilingi.....	Shilling
Enchomata.....	Above
Enchorro.....	Spring
Endaa.....	Food, rations
Endaa engakenya.....	Breakfast (n.)
Endaa enteipa.....	Dinner
Endaa nakuro.....	Mash (n.)
Endama.....	Day

Endama pooke.....	All day
Endap-clouaru.....	Paw (n.) (of a lion)
Endarata.....	Lightning
Enderoni.....	Rat
Endorropo.....	Abbreviations
Endoyloroto engolong.....	Set (sun)
Endungoti.....	Bit (bridle), fraction
Ene.....	Here
Enedokoya.....	First
Eneile.....	Sixth
Eneisojareki.....	Bath
Eneitorit.....	Center
Enemanya.....	Address (n.)
Enemiet.....	Fifth
Enenaapishana.....	Seventh
Enenaauo.....	Ninth
Enesheta.....	Building (n.)
Enetomon.....	Tenth
Enetomon oare.....	Twelfth
Eneuni.....	Third
Engadori.....	Length
Engai.....	God
Engaji.....	House
Engaji ombartan.....	Stable
Engakenya.....	Sunrise, dawn
Engalamu.....	Pen (writing)
Engalem.....	Knife
Engalo nairritishoreki.....	Grazing ground
Engalo naito osiuo.....	Windward
Engampi.....	Camp
Engampu.....	Vinegar
Enganyet.....	Manners
Engapiana.....	Cream
Engarasha.....	Cloth
Engarasha emesa.....	Tablecloth
Engardasi.....	Paper, blotting paper
Engare.....	Water
Engare nagut.....	Deep water
Engarna.....	Name
Engarri.....	Wagon
Engarri naigerishoreki.....	Typewriter
Engashe.....	Calf
Engatampo.....	Cloud
Engayioni.....	Boy
Engayioni nanyamal.....	Busybody

Engayna.....	Hand
Engenai-engai.....	Sky
Engera.....	Silence
Engoitoi.....	Path, method, road, track
Engojongani.....	Mosquito
Engoliai.....	Widow
Engolong.....	Sun
Engolong edokeya.....	Saturday
Engolong enaapishana.....	Friday
Engolong eonguan.....	Tuesday
Engolong euni.....	Monday
Engolong pooke.....	All day
Engolopa.....	Scorpion
Engomom.....	Face (n.)
Engongo.....	Eye
Engoongoni.....	Bug
Engopera.....	Antelope
Engorno.....	Butter, cream
Engoro.....	Severity
Engorore.....	Hunt
Engoruoi.....	Mistress
Engoshoke.....	Belly
Engotok.....	Mouth
En-gotoo.....	Color
Engudi.....	Stick (walking)
Engues.....	Animal
Engumoto.....	Hole
Eniare.....	Second
Eningo.....	Important
Enino.....	Your
Enionguan.....	Quarter, fourth
Enjiet.....	Filter, strainer
Enjore.....	Raid
Enjutet.....	Duster
Enkata.....	Time, hour, period, minute
Enkebongata.....	Handle (n.)
Enkeemata.....	Method
Enkeene.....	Girth (saddle)
Enkejo.....	Leg, foot
Enkejo engarri.....	Wheel
Enkekompe.....	Cup
Enkekompeshaai.....	Teacup
Enkema.....	Fire (n.)
Enkenya-nkiri.....	Mongoose
Enker.....	Sheep

Enkerai.....	Child
Enkerai kete.....	Baby
Enkerroshai.....	Thickness
Enkeshui.....	Cards (playing)
Enkesoge.....	Snuff
Enketarruoroto.....	Fault
Enketeng.....	Cow
Enketoria.....	Reign (n.)
Enkibiriti.....	Match
Enkidonget.....	Griddle
Enkidonget oolpayek.....	Bridle
Enkijiko.....	Spoon (tea)
Enkikenet.....	Lock (n.), padlock
Enkikurrukur.....	Thunder
Enkilepunoto engolong.....	Rise (n.) (of the sun)
Enkine.....	Goat
Enkinyanga.....	Cost (n.), price
Enkiok.....	Bar
Enkiroishi.....	Weight
Enkirouajata.....	Boil (n.)
Enkitingoto.....	End
Enkitojo.....	Hare, rabbit
Enkitukuore.....	Laundry
Enkitunguu.....	Leek
Enkiwangata.....	Lightning
Enkop.....	Country (nation)
Enkop kitok.....	Mainland
Enkorlee.....	Partridge
Enkulale.....	Wooden earring
Enkume.....	Nose
Enkupes.....	Loin
Enkurma.....	Flour, farm
Enkurma e ngano.....	Cone
Enkurriny e kole.....	Cheese
Enkutoto.....	Corner
Enoti ompesai.....	Notes
Entakola.....	Cheek
Entames.....	Camel
Entampi.....	Wick
Entapokai.....	Flower
Entargeeti.....	Grasshopper
Enteipa.....	Sunset
Enteke.....	Airplane
Enterit.....	Dust (n.)
Enteyani-engoriong.....	Backbone

Entilagos.....	Marabou stork
Entim.....	Forest
Entiol.....	Gun
Entirmanet.....	Stick (walking)
Entito.....	Daughter, young girl
Entolu.....	Ax
Entorroni.....	Mess
Entuaa.....	Frog
Entutunyo.....	Heel
Enyamal.....	Busy (v.)
Enyamali.....	Business, confusion
Enyanyukie.....	Form (shape), like (resemble)
Enyewa.....	Udder
Enyokie.....	Red
Enyor.....	Ought
Epe.....	Sharp
Epir.....	Fatten (humans and animals)
Epuyiapui.....	Smooth (adj.)
Ereshat.....	Break
Erisio.....	Fair (just)
Erongo.....	Dik-dik
Eroro.....	Speak
Erragerrag.....	Patch
Erruat.....	Bed
Esaani.....	Saucer
Eselengei.....	Daughter, young girl
Esepa.....	Quite, real
Esepel-e-mpere.....	Blade of spear
Eserai.....	Want (n.) (desire)
Eshal.....	Weak
Esiaai.....	Work (n.)
Esiaai ino.....	Responsible (you are)
Esida1.....	Ostrich
Esidano.....	Well (n.)
Esimu.....	Telegram
Esiniyia.....	Dish (n.)
Esita.....	Fence (n.)
Esokari.....	Sugar
Esontai.....	Wall
Esulana.....	Vest
Esulunoto.....	Fall (n.)
Esumash.....	Hunger
Etaana.....	Near
Etegele.....	Be broken

Etomote.....	Old (worn out)
Eton-ake.....	Still (yet)
Etoyio.....	Dry
Etua.....	Dead
Etulusoyie.....	Pass
Etumoyu.....	Obtainable
Etushukengolong.....	Afternoon
Ewalata.....	Answer (n.)
Ewangan.....	Light (n. and adj.)
Ewiki.....	Week
Ewokat.....	Drink (n.)
Eye.....	Dead
Eyelata.....	Fat (n.), oil
Eyema.....	Tent
Eyemayu.....	Passable
Eyiarare.....	Cookery
Eyiarata.....	Boil (n.)
Eyieunoto.....	Want (n.) (desire), need (n. and v.)
Idie.....	There
Iloisotok-loonguesi.....	Claws
Imiet.....	Five
Imotonyi.....	Fowl (pl.)
Impoto.....	Call (v.)
Imurto.....	Neck (pl.)
Inguesi.....	Stork
Ininingo.....	Feel
Inkik (imodiok).....	Spoor (dung)
Inkiri enketeng.....	Beef
Inkisunguu.....	Button
Inosie (ainyoo inosie?)....	Cost (what does it?)
Inyango.....	Buy
Inyo.....	Stand, arise
Ip.....	Hundred
Ip are.....	Two hundred
Ip imiet.....	Five hundred
Ip isiet.....	Eight hundred
Ip lle.....	Six hundred
Ip naapishana.....	Seven hundred
Ip naaudio.....	Nine hundred
Ip onguan.....	Four hundred
Ip tomon.....	One thousand
Ip uni.....	Three hundred
Iririki.....	Fit in
Irouajie.....	Boil (v.)

Iruko.....	Believe
Isiajaiye.....	Clear away
Isiet.....	Eight
Isoito.....	Stone (pl.)
Isotunot.....	Hook (peg)
Isuut engoshoke.....	Entrails
Iyelle.....	Grease (v.)
Iyie.....	You
Jikoni (Swahili).....	Stove
Juma pili (Swahili).....	Sunday
Kaa?.....	(What) sort?
Kaji?.....	Where?
Kaji eikununo?.....	How?
Kake.....	But
Kedianye.....	Left (hand)
Keik.....	Cake
Kenengay?.....	Whose?
Keshewaine.....	Coast, ashore
Kete.....	Small, little, young
Kete toki.....	Something
Kewarie.....	Night
Kinyi.....	Tiny, minute (small)
Kishiaa.....	Good
Kishomi.....	Gate
Kitok.....	Main, big, great, large, stout, important
Kole.....	Milk
Kona.....	These
Kote.....	Few
Kotokaji.....	Door
Kulie alang.....	More
Kumok.....	Many
Laasak lesiaai.....	Workmen
Laisoyosoy.....	Ants (warrior)
Lbolabol.....	Sign
Lekelēl.....	Round, circle
Lgoso.....	Throat (pl.)
Lkeek.....	Firewood
Lkeko.....	Thorn (pl.), weed (pl.)
Lketente.....	Ants (flying)
Lkipieu.....	Lung
Lkuluki.....	Mucus (pl.)
Llaakinot.....	Wages
Llaker.....	Stars
Llala.....	Teeth

Llalema.....	Sword (pl.)
Lle.....	Six
Lloisusu.....	Flea
Llomon.....	Visitors, news
Lmariko.....	Banana plant
Lmiintoni.....	Earring (pl.) (for men)
Lmoilak.....	Beetle (pl.)
Lnyanya.....	Tomato
Lomon ngejuko einaikununo.....	Condition
Loonkishu.....	Herd
Lpapat.....	Hair (pl.)
Lpayek.....	Maize (plant)
Lpayiani lolker.....	Southern Cross
Lpepedo.....	Yaws
Lpumpui.....	Bead
Maakotete.....	Gradually
Maanabo.....	Each
Mbelekenya.....	Change (v.) (articles)
Mbenek.....	Leaves
Mboga (Swahili).....	Vegetables
Mbukoki.....	Spill
Meidemayu.....	Cannot be done
Meidor.....	Permanent
Metabayke.....	Tomorrow
Metabayke kewarie.....	Overnight
Mingani.....	Blunt (unsharp)
Mme neiija.....	Not so
Mme pooke kata.....	Seldom
Mme toki.....	Nothing
Mmeyemayu.....	Impassable (road)
Modooni.....	Blind
Monyaka.....	Luck
Mperra.....	Split
Mpesai.....	Money
Mpota.....	Fill
Musana.....	Old (worn out)
Naaleko.....	Rest (remainder)
Naapishana.....	Seven
Naatii.....	Contents
Naaudo.....	Nine
Nabo.....	First, one
Nabokata.....	Quickly, at once
Naiba osena.....	Moth
Nano.....	I
Natii soitto orolkarkar.....	Stony

Ncholakinot.....	Ingredient
Nchoo.....	Cattle, give
Ndaareta.....	Utensils
Ndanyat.....	Marsh (n.)
Ndepa.....	Finish
Neijia.....	Right (correct)
Nenye.....	He
Ngalao.....	Ants (small black)
Ngalolongani emonge.....	Anklet
Ngano (Swahili).....	Wheat
Ngarash.....	Clothes
Ngatampo.....	Cloud
Ngaytobolo.....	Vegetables
Ngejuk.....	New, fresh
Ngiro.....	Brown
Ngojene.....	Lame
Ngole.....	Yesterday
Ngolengola.....	Stir
Ngolongi olapa.....	Calendar
Ngolongi pooke.....	All day
Ngonyek.....	Eyes
Ngora.....	Keep (guard), see
Ngorake.....	Face (v.)
Ngoro.....	Find
Nkekesat.....	Crops
Nkena.....	Count up
Nkeno.....	Close (v.)
Nkepa olmosori.....	Whites of egg
Nkerra.....	Sheep (pl.)
Nkewaritin pooke.....	All night
Nkilikwano.....	Ask
Nkimek.....	Matter (pus)
Nkiporjoporjat.....	Mixture
Nkiri.....	Meat
Nkiri olbitir.....	Bacon
Nkuk.....	Charcoal
Nkulalen.....	Wooden earring (pl.)
Nkulukuok.....	Soil (earth), ground (earth)
Nkuruon.....	Ashes
Nnaatii.....	Ingredient (pl.)
Nnambari.....	Number
Nnamoka.....	Boot (pl.), sandal (pl.)
Nnashei.....	Thanks
Nnaudot.....	Mortices
Ntadoiki.....	Drop (v.)

Ntamaaya.....	Copy
Ntargeet.....	Grasshopper (pl.)
Ntaritik.....	Fowl
Ntarruoi.....	Litter (v.)
Ntasho.....	Stop, stand up
Ntataana.....	Close (v.)
Ntenyeko.....	Close (v.)
Ntero.....	Begin, commence, start (v.)
Ntokitin eaji.....	Furniture
Ntomonile.....	Sixty
Ntomoninaaudio.....	Ninety
Ntomoninaapishana.....	Seventy
Ntomonisiert.....	Eighty
Ntongake.....	Drop (v.)
Ntoshola.....	Add up
Ntotio.....	Feed, breed (v.)
Olaasani lesiaai.....	Workman
Olabaani.....	Doctor
Olaborra.....	Bubble (n.), froth
Olaguatani.....	Carpenter
Olaingorani.....	Ganger, overseer
Olairakuji.....	Kidney
Olalay.....	Tooth
Olale.....	Pen (for fowl)
Olale leboo.....	Toolshed
Olale lonkishu.....	Cowshed
Olalem.....	Sword
Olameyu.....	Famine
Olamoye.....	Donkey (male)
Olanapani.....	Carrier
Olapa.....	Moon, month
Olari.....	Year
Olarriponi.....	Guard (n.)
Olarro.....	Buffalo
Olashe.....	Heifer
Olashepani.....	Deep gorge
Olasorai.....	Snake
Olaturoni.....	Cultivator
Olayiarani.....	Cook (n.)
Olbakuli.....	Basin, bowl
Olbeleleng.....	Tractor
Olbene.....	Bag
Olbolet.....	Key
Olboroi lesarngab.....	Brick
Olchani.....	Timbers

Olchani odopesho.....	Aperient
Olchoni.....	Skin (n.), oxhide
Olchore.....	Friend
Oldia.....	Dog
Oldoinyio.....	Mountain
Olee.....	Male
Olong.....	Very
Olongoti.....	Customs house, stump
Olgoo.....	Breast, chest (of body)
Olgos.....	Throat
Oliapis1.....	Officer
Oljepet.....	Splinter
Olkanchao1.....	Elephant
Olkaraniy.....	Clerk
Olkarkar.....	Rubble, stony
Olkataar.....	Armlet
Olkedongoy.....	Tail
Olkejo.....	River
Olkelangelanget.....	Lamp
Olkenos.....	Crocodile
Olkepaaret.....	Card (labor)
Olkeperrati.....	Block (up)
Olkereri.....	Line
Olkeresure.....	Guinea fowl
Olketongati.....	Drop (n.)
Olkikenet.....	Bolt
Olkikwei.....	Thorn
Olkimojino.....	Finger
Olkimojino lenkejo.....	Toe
Olkitok.....	Master
Olkiu.....	Anthill
Olkorragos.....	Vulture
Olkoyantiki.....	Wizard
Olkukuri.....	Gourd
Olkuluk.....	Mucus
Olkuluk-lengojongani.....	Net
Olkumpau.....	Tobacco
Olkunoni.....	Mason, smith
Olkurtet.....	Tablespoon
Olmairo.....	Medicine
Olmakaw.....	Hippopotamus
Olmampuli.....	Umbrella
Olmangatinta.....	Enemy
Olmasher1.....	Tick
Olmashunguai.....	Orange (tree or fruit)

Olmayma.....	Lizard (water)
Olmeot.....	Giraffe
Olminto1.....	Earring (for men)
Olmiranketi.....	Blanket
Olmoilaa.....	Beetle
Olmorrani.....	Warrior
Olmoshaara.....	Wages
Olmoshomaa.....	Nail (n.), screw
Olmosori.....	Egg
Olmoti.....	Tobacco pipe
Olmunyi.....	Whisker
Olnganayioi.....	Fruit
Olngatung.....	Lion
Olngejep.....	Tongue
Olngojene.....	Hyena
Olngusil.....	Smell (n.)
Ologelalem.....	Lizard (garden)
Ologol.....	Stump
Oloidolol.....	Elbow
Oloidongishoi.....	Blacksmith
Oloikuma.....	Tortoise
Oloingone.....	Bull
Oloip.....	Shade
Oloirobe.....	Fever
Oloisctoo.....	Fingernail
Oloitiko.....	Zebra
Oloito.....	Bone
Oloito lelokonya.....	Skull
Olojongani.....	Fly
Oloia.....	Load
Ololubo.....	Impalla
Olmesera.....	Baobab
Olongorlokonya.....	Dizzy
Olonyamal.....	Busybody
Oloonkelani.....	Soap
Olorika.....	Chair, stool
Olorika.....	Spot
Olosho.....	Country (nation)
Olotoroki.....	Bee
Olouaru-keri.....	Leopard
Olpapeta.....	Hair
Olpayian.....	Old person
Olpedelai.....	Flea
Olpejata.....	Corner
Olperere.....	Store

Olpisiai.....	Chain
Olpisiai oitorit.....	Half
Olpuaa.....	Bushbuck
Olpul.....	Hotel, store
Olpur.....	Lizard (house)
Oltaw.....	Heart
Oltaw lenchata.....	Spirit level
Oltedo.....	Needle
Olteyani.....	Bamboo
Oltipoti.....	Spot
Oltolilo.....	Noise
Oltonet lenchoni.....	Saddle (n.)
Oltongani.....	Man
Oltongani lelokonya.....	Headman
Oltupa.....	Bottle
Olturoto.....	Lake
Olturrur.....	Herd
Ometaba.....	Until
Onguan.....	Four
Onom.....	Fifty
Openy.....	Alone
Orangi.....	Ink, paint (n.)
Orashata.....	Spot
Oringa.....	Hammer (n.)
Oriong.....	Back (n.)
Oriri.....	Ants (white)
Orisasi.....	Bullet
Ororei.....	Noise
Orrekie.....	Spoor (tracks)
Orusa.....	Leave (permission)
Osagam.....	Bridge
Osampurumpuri.....	Butterfly
Osanag.....	Bush (scrub)
Osanduku.....	Box
Osarge.....	Blood
Osenyai.....	Sand
Osesen.....	Body
Osikiria.....	Donkey (male)
Osinga.....	Servant
Osingira.....	Store
Osingolio.....	Dance
Osirua.....	Eland
Ositima.....	Steam
Osiuo.....	Wind (n.)
Osoit.....	Stone

Osororua.....	Navel
Osotua.....	Peace
Osoyai.....	Wire (copper and brass)
Osuyiani.....	Wolf
Ote.....	Young
Ou.....	Come
Ou aji.....	Come in
O.....	And
Pesho.....	Useless
Pilipili.....	Pepper
Pooke.....	All, whole, every
Pooke kata.....	Permanent
Pooke toki.....	Anything, everything
Pooke wueji.....	Everywhere
Pororongos.....	Roughly
Ronga.....	Thin
Roruat.....	Spoor (tracks)
Rouajie.....	Bake
Rreta.....	Keep (guard)
Rrewai.....	Send
Sapok.....	Big, great, important, large, stout
Sayen.....	Bead
Senger.....	Fish
Sere.....	Farewell, goodbye
Sewsew.....	World
Shaa.....	Tea, coffee
Shakeni.....	Witness
Shomata.....	High, above, on, over
Shomo.....	Go
Shumpi.....	Salt
Siadi.....	Back (n.)
Sidai.....	Best, good, well (adv.), nice, beautiful
Sii.....	Also
Soja.....	Clean (v.)
Sokoni (Swahili).....	Market
Sotunot.....	Peg (hat)
Suut.....	Litter (dirt)
Taaistere.....	Tomorrow
Taara te mburashi.....	Brush (v.)
Taata.....	Now
Tabarake.....	Be careful
Tabolu.....	Hull
Tadamo.....	Remember, consider, think

Tadekenya.....	Morning
Tadotu (olalay).....	Extract (tooth)
Tanangai.....	Throw
Tanapa.....	Carry
Tapala.....	Stop
Tapalakake.....	Excuse, excuse me, pardon, forgive
Tapejo.....	Burn (v.t.)
Taramata.....	Keep (guard), breed (v.)
Tasioki.....	Quickly
Tatene.....	Right (hand)
Tayilolo.....	Hull
Te.....	At, per, to
Tedokoya.....	Before (time)
Teeka.....	Hang up
Tegela mpesai.....	Change (n. and v.) (money)
Tegerayu!	Silence!
Teidiaalo.....	Before (place)
Teine.....	There
Teipa.....	Evening
Teleja.....	Cheat
Tembarakinoto.....	Carefully
Tenaa.....	Like (a), if
Tenebo.....	Altogether, together
Teneshuko engolong.....	Afternoon
Tengarake.....	For
Tengay.....	After, then
Tenkata.....	While
Tentorróni.....	Badly
Tepat.....	Meaning
Tepeka (atua).....	Tuck in
Tereshata.....	Between
Teseriani.....	Safely
Tesiadi.....	Behind, latter
Teyiara.....	Cook (v.)
Tiabori.....	Under, underneath
Tiatua.....	Into
Tikitam.....	Twenty
Toki.....	Something
Tokol.....	Completely
Tokorrake.....	Tighten
Toliki.....	Sell
Tolimu.....	Sell
Tomon.....	Ten
Tomon iuni.....	Thirty

Tomon oare.....	Twelve
Tomon obo.....	Eleven
Tomon oile.....	Sixteen
Tomon oisiet.....	Eighteen
Tomon omiet.....	Fifteen
Tomon onguan.....	Fourteen
Tomon ookuni.....	Thirteen
Tomon oopishana.....	Seventeen
Tomon oudo.....	Nineteen
Tonyorra1.....	Believe
Toola.....	Answer (v.)
Tooreworo.....	Separately
Tooro endaa.....	Dish up, serve up
Tooshe olkereri.....	Line up
Toosho.....	Beat
Toosho toringa.....	Hammer (v.)
Topolosa.....	Tear (v.)
Toponai.....	Add to
Torrone.....	Bad
Tosoja.....	Follow
Totona (tenkop).....	Sit down
Tuan.....	Good
Tununuko.....	Fold
Tupukuro.....	Cover (v.)
Turubeni (Swahili).....	Field glasses
Tuudo.....	Bore (v.)
Uni.....	Three
We.....	And
Yao.....	Bring

NOTES ON THE MBULU OF TANGANYIKA

Between Olduvai and Arusha I¹⁸ entered a Mbulu hut and recorded the following notes:

The hut is 5'6" above ground and has a very flat, scarcely sloping roof, part of the hut being underground. These low huts are often grass-covered, mainly to camouflage them against the Masai but also to offer some protection against fire. Five other tribes allied to the Mbulu use this same type of hut. The walls and roof are of mud, plastered with cow dung. The roof is supported by rough-hewn posts. The entrance is on the right slightly off center. The first room (20' x 15') is the cattle pen; there is a separate enclosure for sheep and goats. The left-hand section consists of the sitting room and the storeroom. On the right are the hearth and the wooden platform used as sleeping quarters. The smoldering fire makes the atmosphere deep blue and is hard on the eyes, but it reduces the number of vermin.

Household furniture included: a large basket (kunti) plastered on the outside with cow dung; an open-mouthed basket (laquanti) for carrying crops from the garden; a saddle quern (nklaa); a small cooking pot (ktluai); a calabash (dahah); a narrow-mouthed vessel (m'pei); a sleeping place (kitara); half a calabash (sukami) used as a ladle; a spouted calabash (uruntli) with a square hole one inch in diameter behind the spout; a mat (hafta); a small mat (luki) for removing dung; and some U.S. Hickory King maize (aiitu) and sorghum (manguri) in bags.

The Mbulu can no longer make pottery. There is no suitable clay in their district, and as a result the art has been lost.

The family included the Mbulu man, his wife, and children. The man had green-brown eyes, speckled sclera, and each ear lobe was punctured with a dime-sized hole. He was about 5'6" tall, small-boned, with good carriage, dark brown skin, medium-thick lips, and white, regular teeth. His nose was thin, small, and convex. His forehead was large and prominent; his face bore some freckles. His big toes were widely spaced.

His wife was a tall Negroid type, with thick lips, curly hair, and cicatrization scars over each pendent

breast. The children were seven boys aged three to fifteen, a two-year old girl, and a baby strapped to the mother's back. Only one boy, aged eight, resembled the non-Negroid father.

ENGLISH-MBULU

The following words were recorded from the Mbulu caretaker at Ngorongoro Camp on March 30, 1948.¹⁹

English	Mbulu	English	Mbulu
Arm.....	Dawa	House (hut)....	Dû
Arrow.....	Mahau	Hungry.....	Quarit
Bad.....	Katlawka	Lake.....	Ila
Bow.....	Ghalî	Leg.....	Iyai
Cat.....	Maisi	Lion.....	Diraû
Cattle.....	Khîêê	Man.....	Geremar
Child.....	Naaî	Mole.....	Khutî
Clothes.....	Ingwadi	Moonless.....	Eunah
Cloud.....	Clargu	Moonlight.....	Clahan
Club.....	Ghulelai	Mother.....	Aiyu
Dog.....	Seai	Mountain.....	Ghear
Donkey.....	Doghai	Nose.....	Dungah
Drink water....	Maiwahi	Pathway.....	Loki
Ears.....	Iiya	Person.....	Ilûgûû
Eat.....	Ayimga	Rat.....	Gharau
Eyes.....	Ila	Rhinoceros.....	Dofaa
Face.....	Gisarh	Roof.....	Hafa
Father.....	Baba	Sheep.....	Gwenda
Finger nail....	Fûgûû	Sick.....	Itirk
Fire.....	Atha	Sky.....	Dûûri
Garden.....	Ghaimu	Sleep.....	Kaat
Giraffe.....	Samasi	Smoke.....	Ghûi
Goat.....	Lei	Spear.....	Lawala
God (sun).....	Luaa	Teeth.....	Sehena
Good.....	Kahow	Thank you.....	Nag
Grass.....	Gizo	Tired.....	Aguthagat
Hair.....	Seeum	Tree.....	Khaana
Hallux.....	Dungûû	Valley.....	Barabarar
Happy.....	Kailu	Water.....	Mai
Head.....	Saga	Woman.....	Ameni

ENGLISH-MBULU
NUMERALS

No.	Mbulu	No.	Mbulu
1.....	Wûk	9.....	Qualel
2.....	Sarr	10.....	Mibang
3.....	Tûm	11.....	Mibang wûk
4.....	Tzia	12.....	Mibiri sarr
5.....	Koan	21.....	Mibiri sarr
6.....	Lahoo		ni wûk
7.....	Fauq	100.....	Ziru
8.....	Dakxat	1000.....	Kuma

MBULU-ENGLISH

Mbulu	English	Mbulu	English
Aguthagat.....	Tired	Gwenda.....	Sheep
Aiyu.....	Mother	Hafa.....	Roof
Ameni.....	Woman	Iiya.....	Ears
Atha.....	Fire	Ila.....	Eyes or Lake
Ayimga.....	Eat	Ilûgûû.....	Person
Baba.....	Father	Ingwadi.....	Clothes
Barabarar.....	Valley	Itirk.....	Sick
Clahan.....	Moonlight	Iyai.....	Leg
Clangu.....	Cloud	Kaat.....	Sleep
Dakxat.....	Eight	Kahow.....	Good
Dawa.....	Arm	Kailu.....	Happy
Diraû.....	Lion	Katlawka.....	Bad
Dofaa.....	Rhinoceros	Khaana.....	Tree
Doghai.....	Donkey	Khîêê.....	Cattle
Dû.....	House (hut)	Khuti.....	Mole
Dungah.....	Nose	Koan.....	Five
Dungûû.....	Hallux	Kuma.....	One thousand
Dûûrî.....	Sky	Lahoo.....	Six
Eunah.....	Moonless	Lawala.....	Spear
Fauq.....	Seven	Lei.....	Goat
Fûgûû.....	Fingernail	Loki.....	Pathway
Geremar.....	Man	Luua.....	God (sun)
Ghaimu.....	Garden	Mâhau.....	Arrow
Ghali.....	Bow	Maî.....	Water
Gharau.....	Rat	Maisî.....	Cat
Ghear.....	Mountain	Mibang.....	Ten
Ghûî.....	Smoke	Mibang sarr....	Twelve
Ghulelai.....	Club	Mibang wûk....	Eleven
Gisarh.....	Face	Mibiri sarr....	Twenty
Gizo.....	Grass	Mibiri sarr	
		ni wûk.....	Twenty-one

<u>Mbulu</u>	<u>English</u>
Naa ^f	Child
Nag.....	Thank you
Qualel.....	Nine
Quarit.....	Hungry
Saga.....	Head
Samasi.....	Giraffe
Sarr.....	Two

<u>Mbulu</u>	<u>English</u>
Sea1.....	Dog
Seeum.....	Hair
Sehena.....	Teeth
Tûm.....	Three
Tzia.....	Four
Wûk.....	One
Ziru.....	One hundred

FAUNA COLLECTED BY THE EXPEDITION

by

Karl P. Schmidt²⁰

The following 333 specimens were collected by Dr. Henry Field in Egypt (Faiyum and Sinai), the northern Sudan, and Kenya during the University of California African Expedition, 1947-1948. The fine series of Bufo viridis from Ruafah in Sinai were collected by William B. Terry, field executive of the Expedition.

LIZARDS

Family: <u>Chamaeleonitadæ</u>		<u>Specimens</u>
<u>Chamaeles gracilis</u>		
SUDAN: Abka, 16 miles south of Wady Halfa.....	5	
Family: <u>Gekkonidæ</u>		
<u>Tarentola annularis annularis</u>		
FAIYUM: Kom Oshim.....	6	
Bait el-Afshar.....	1	
SUDAN: Abka.....	1	
<u>Ptyodactylus</u>		
SUDAN: Abka.....	4	
Abu Hamed.....	1	
<u>Stenodactylus</u>		
SINAI: Feiran Oasis.....	1	
<u>Hemidactylus</u>		
FAIYUM: southern edge of Jebel Qatrani, 15 miles north of Kom Oshim.....	2	
Family: <u>Scincidæ</u>		
<u>Scincus scincus</u>		
SINAI: El Arish.....	4	
<u>Chalcides sepsoides</u>		
FAIYUM: Kom Oshim.....	9	
Jebel Qatrani.....	4	
SINAI: Feiran Oasis.....	2	
SUDAN: Abka.....	4	
Berber to Abu Hamed.....	4	

LIZARDS

	<u>Specimens</u>
<u>Mabuya quinquetaeniata</u>	
FAIYUM: Kom Oshim.....	3
Jebel Qatrani.....	3
SUDAN: Abka.....	21
Berber to Abu Hamed.....	61
Family: <u>Agamidae</u>	
<u>Uromastix ocellatus</u>	
SUDAN: Abka.....	15
<u>Agama mutabilis</u>	
FAIYUM: Kom Oshim.....	2
SINAI: Feiran Oasis.....	1
<u>Agama pallida</u>	
SINAI: Ruafah near Abu Aweigila.....	1
<u>Agama agama</u>	
FAIYUM: Kom Oshim.....	1
<u>Agama stellio</u>	
SINAI: St. Catherine's Monastery area.....	1
Family: <u>Lacertidae</u>	
<u>Acanthodactylus boskianus</u>	
FAIYUM: Kom Oshim.....	1
SINAI: Serabit el-Khadem.....	1
<u>Acanthodactylus scutellus</u>	
SUDAN: Berber to Abu Hamed.....	1
<u>Acanthodactylus pardalis</u>	
FAIYUM: Kom Oshim.....	3
<u>Eremias rubropunctata</u>	
FAIYUM: Kom Oshim.....	7
SINAI: Feiran Oasis.....	1
St. Catherine's Monastery area.....	6
Wadi Sidri.....	1
Serabit el-Khadem.....	1
Family: <u>Varanidae</u>	
<u>Varanus niloticus ninatus</u>	
SUDAN: Berber to Abu Hamed.....	2

CROCODILE

Family: <u>Crocodylidae</u>	
<u>Crocodylus niloticus</u>	
SUDAN: Abu Hamed.....	1

TURTLE

Family: Testudinae

<u>Testudo leithi</u>	<u>Specimens</u>
SINAI: El Arish.....	1

FROGS

Family: Bufo viridis

<u>Bufo viridis</u>	
SINAI: El Arish.....	4
Ruafah near Abu Aweigila.....	162

<u>Bufo regularis</u>	
FAIYUM: Kom Oshim.....	1
Fidiya.....	2
SUDAN: Abka.....	2

NOTES

- ¹For an account of the Masai of Tanganyika, see H. A. Fosbrooke, "A Sociological Survey of the Masai of Tanganyika Territory," MS, pp. 1-72. Copy in the Secretariat, Nairobi. See also Tanganyika Notes and Records, No. 26, Dec., 1948.
- ²Excerpt from a report to the Secretariat, Nairobi, by Dr. L. Schapera. Part of this chapter and most of the Bibliography have been drawn from this excellent summary.
- ³The others were the Kaputier of the Athi and Kapite plains, the En Aiposha of the Rift Valley, the Laikipiak, and the Kisongo of the Masai steppe in Tanganyika south and west of Kilimanjaro.
- ⁴The Enjamusi are briefly described by von Höhnelt (1894) and Hobley (1906); some notes on their early history, laws, and customs are given by Beech (1911) and K. R. Dundas (1910). There is a good deal of scattered information on their more recent history and present economic condition in the "Evidence . . .," Kenya Land Commission, 1932 (vol. 2, pp. 1173-1927 passim).
- ⁵There are brief general descriptions of their culture by such writers as Arkell-Hardwick (1903), von Höhnelt (1894), and more recently by Webster (1944), and notes on their tribal divisions and social organization by Clarke (1935) and Hobley (1910). The Elmolo, an impoverished group mainly of Samburu (but including some Rendile) living at Lake Rudolf, have been described by Dyson and Fuchs (1937). There is also a good account of Samburu history by Bader (1933) and a considerable amount of information of their economic life and land problems in the Report of the Kenya Land Commission, 1932 (ch. 6) and in the "Evidence . . .," (vol. 2, pp. 1447-1697 passim).
- ⁶Recorded at Mbitini.
- ⁷Recorded at Marwa.
- ⁸Recorded at Kazikeo.
- ⁹The figures for 1946 were: Loitokitok, 5,551; Matapatu 3,682; Kaputiei 2,952; Dalalekotok 2,190; Lodokilani 2,111; Purko 1,175; Sighirari 876; total 18,527. Non-Masai total 2,486; and non-native population: Europeans 56; and Asians 268.
- ¹⁰From information supplied by Mr. G. C. M. Dowson, District Commissioner, Kajjado.

- ¹¹ From MS by Dr. L. Schapera submitted to the Secretariat, Nairobi, together with the bibliographical references included here for the use of students.
- ¹² All Masai, irrespective of tribe or caste, belonged to the Gellat, formerly divided into Rogaetin and Odomungi. These were again subdivided. Formerly, in the Northern Reserve the most important Gellat were: Il Molelyan, Il Mokkesen, Il Tarosero, Il Laiser, and Il Lugumai.
- ¹³ These were probably part of the Kekonyukie Section, who, according to Mr. Eric Sweatman, number 3,452 persons. They live between the Ngong Hills and the lower slopes of the Mau, south of Lake Naivasha and have always regarded Ngong as their administrative center. On their northern boundary lies an area of unoccupied Crown Land, a few European farms and for approximately twenty miles the Kikuyu of Kiambu District are their neighbors. It might be said that the Kekonyukie country runs from east to west across the Rift Valley from the floor of which rises Mt. Suswa. Their Chief is Muneria ole Shepara, and he, like many Masai who have come into close contact with the Kikuyu, is a cultivator as well as a cattle owner. There has been much intermarriage between the Kekonyukie of the Ngong area and the Kikuyu living only a few miles away as Kikuyu wives are more fertile than the disease-ridden Masai and know how to cultivate their husband's shambas. There are very few true Masai bomas near Ngong where more modern living conditions modeled on the round or square huts of the Kikuyu have taken the place of the Masai boma. This Kikuyu influence is on the increase and within another generation there will be as much Kikuyu as Masai blood in the inhabitants of the Ngong area.
- ¹⁴ I am indebted to Dr. J. C. Trevor, Cambridge University, who called my attention to these references: Norman M. Leys and T. A. Joyce, "Note on a Series of Physical Measurements from East Africa," *Journal of the Royal Anthropological Institute*, vol. XLIII, pp. 195-267.
- ¹⁵ Godfrey Njao a Masai schoolteacher at Kajiado, fifty miles west of Nairobi, was invited to accompany us to Selengei (Eselengei) as interpreter by the office of the District Commissioner, Kajiado. He is now compiling a history of the Masai based on the fast-disappearing oral tradition. Since no Masai phrase book was available, it was decided to request him to compile a list of useful words and phrases arranged and based almost in toto on B. J. Ratcliffe and Sir Howard Elphinstone, "A New English-Swahili Phrase Book," printed by the East African Standard Ltd., Nairobi, 1932. I added certain words that are part of the everyday life and culture of the Masai. The Masai-English section was compiled and typed in Washington by Miss Theodore Sedgwick. This vocabulary was checked by Miss Emily C. Davis, and a list of inconsistencies forwarded to

Godfrey Njao, Kajiado. Generous assistance in correcting errata and corrigenda was rendered by Mr. G. C. M. Dowson, District Commissioner at Kajiado, and his staff, including W. F. B. Pollok-Morris, District Officer, A. F. Jacobs, District Assistant, and Dr. S. S. Bhardwaja, Medical Officer (sub-Assistant Surgeon). All diacritical marks were deleted. Miss Elizabeth Beverly retyped and checked the final copy. (H.F.).

¹⁶ See also the First and Second Masai Readers for children and adults by Margaret N. Le Riche with assistance from James Ngatia, John Mark Gideon Saina, and Jason Kirruti, Nairobi, 1947 and 1948.

¹⁷ In Masai Shaai = tea or coffee.

¹⁸ Assisted by Dr. L. S. B. Leakey, who corrected the spellings and added the diacritical marks.

¹⁹ Letters with a circumflex indicate pronunciation midway between long "u" and long "o".

²⁰ Chief Curator of Zoology, Chicago Natural History Museum.

The following abbreviations have been used:

BMCEA	Bulletin of the Mountain Club of East Africa (Kenya Section). Nairobi.
JEANHS	Journal of the East African Natural History Society. Nairobi.
JEAUNHS	Journal of the East Africa and Uganda Natural History Society. Nairobi.
NADM	Reference numbers to files in the Secretariat, Nairobi.

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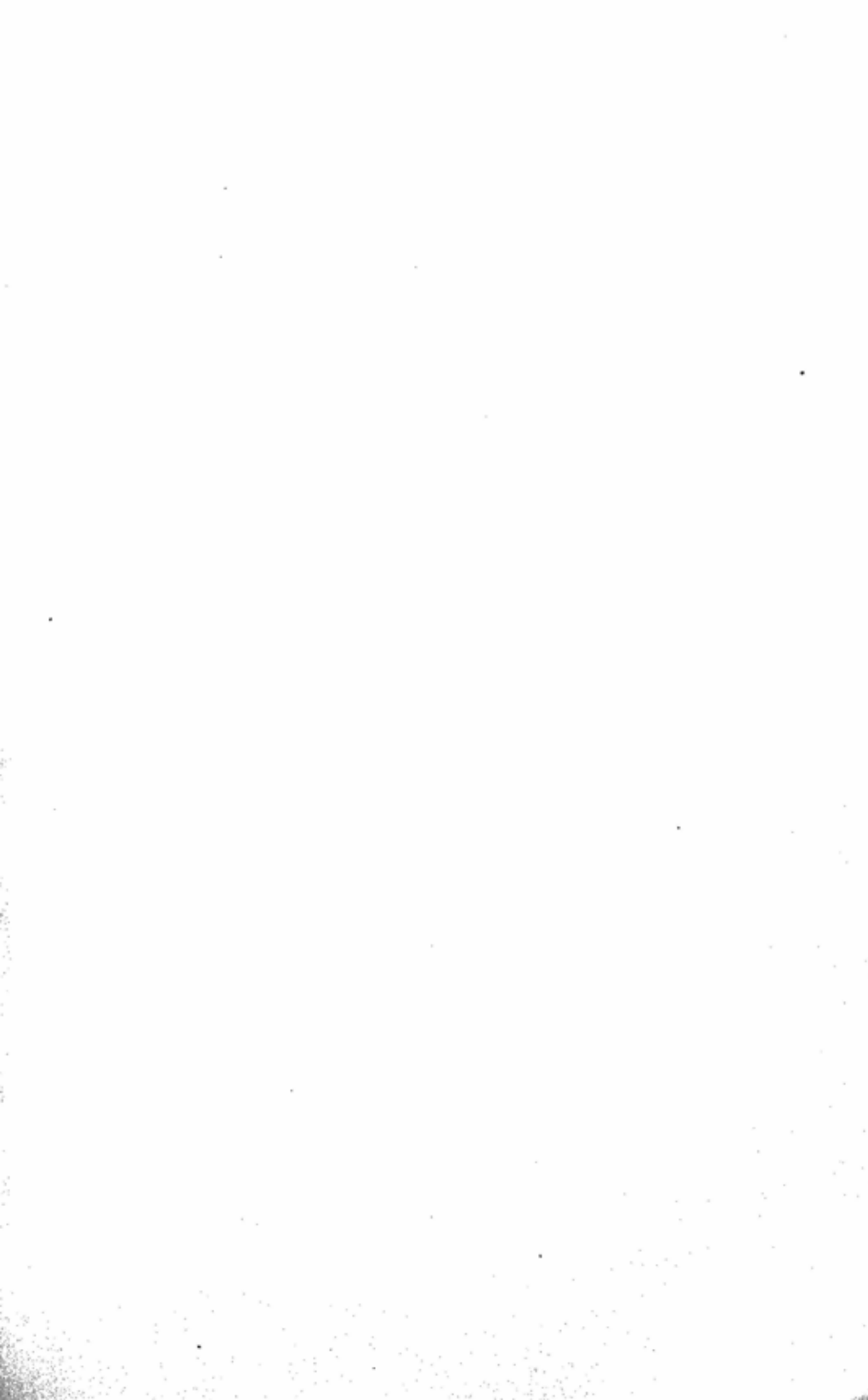
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