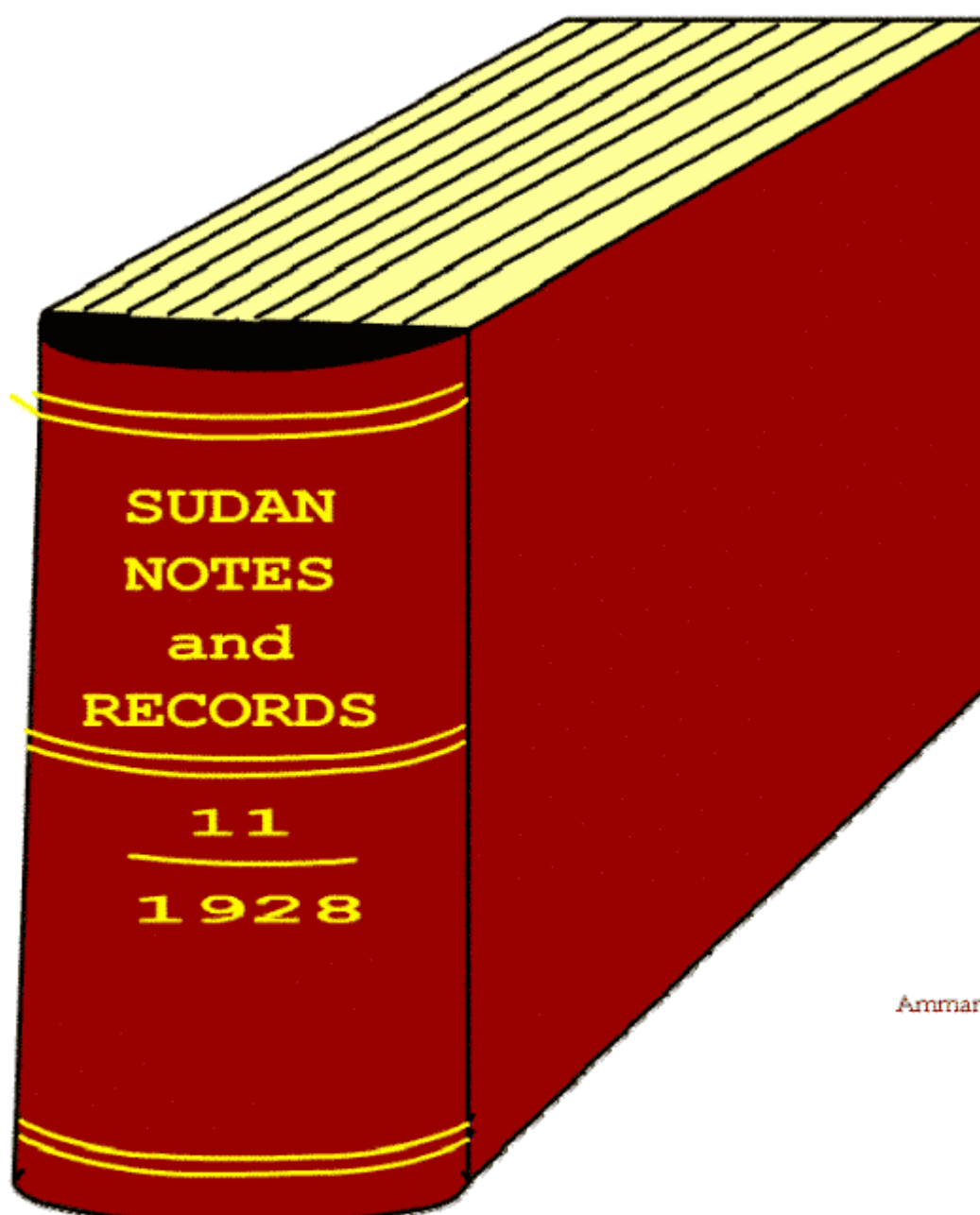




Ammar Yasir

SUDAN NOTES & RECORDS

VOLUME XI
1928



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**SUDAN NOTES
AND RECORDS**

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Transliteration of the Arabic alphabet

adopted by the Editors of «Sudan Notes and Records».

ا	{ at beginning of word omit, ham- za elsewhere }	ذ	dh (coll. d)	غ	gh
		ر	r	ف	f
		ز	z	ق	q (coll. g)
ب	b	س	s	ك	k
ت	t	ش	sh	ل	l
ث	th (coll. t or s)	ص	ṣ	م	m
ج	j	ض	ḍ	ن	n
ح	ḥ	ط	ṭ	ه	h
خ	kh	ظ	ẓ	و	w
د	d	ع	ʿ	ي	y

Vowels.				Diphthongs.	
fatha	a,	lengthened	ā	اَـ	ai (as in aisle) coll. ē
kasra	i,	—	ī	اِـ	au (as in mauser) coll. ū
damma	u,	—	ū	The ا of the article always remains l .	
				Silent t (ة) to be omitted.	

Notes.

1. The system will not be applied to well known names. Write Khartoum, Omdurman, instead of Khartūm, Umm Darmān.
2. In transliterating colloquial Arabic follow the pronunciation and not the spelling, giving the vowels their value as in Italian.

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SUDAN NOTES AND RECORDS

Vol. XI

1928

ORACLE-MAGIC OF THE AZANDE *

By E. E. Evans-Pritchard.

(PLATES I-IV.)

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* This Paper constituted part of a thesis submitted for the Degree of Ph.D in the University of London.

I. INTRODUCTORY NOTE.

THE present Paper is devoted to an analysis and description of the oracle-system and the attempt to answer the difficult psychological problems which arise from native belief in their magic, and to show how the machinery of oracles is adapted to sustain their faith and so carry out useful social processes.

2. (a) GATHERING OF THE BENGE.

Amongst the many forms of divination¹ employed by the Azande, *benge* holds a place apart. This will be seen clearly when I give the social contexts in which it is used. Firstly, however, the method of use must be described. *Benge* is a red powder obtained from a forest creeper, which, when mixed with water, forms a paste. This paste is administered to chicken and causes spasms which, according as they are fatal or passing, determine the answers to the various questions addressed to the magic.

To keep to chronological order in description—*benge* must first be obtained. This is a dangerous and arduous task, as the plant does not grow in Zandeland, but in the more wooded regions to the south of the great Wells river, in the homelands of the Mangbettu and Abarambo. The distance alone, one of some hundreds of miles from the Azande of the Sudan, made the journey arduous, and the hostility of the Mangbettu and Abarambo involved continual danger and humiliation. For these peoples, as owners of the forests, often killed and always exacted large presents from the *benge* gatherers. Apart from these hardships, the travellers had to endure the privations of abstinence demanded in all important magical endeavour. Throughout the entire expedition, from the setting out to the return, the traveller must avoid all sexual cohabitation, his daily routine and enjoyment; he must abandon the habit of smearing his body with oil, which, to the Zande, is to abandon cleanliness and the comfort of having a good appearance. He must refuse all dark-skinned animals such as the favoured flesh of the bush-buck and of the red wild pig, and of the wart-hog, and of the kob, and of the buffalo and of many other beasts. Also he must not eat the strong-smelling

¹ Divination and oracles are words taken over with classical associations. Whether the distinction in classical usage is really applicable to Zande culture or not need not be discussed here.

white flesh of the elephant nor the odorous flesh of fish, for these are smelling animals and unclean to men associated with the magic *benge*. Likewise he must shun some of his favourite vegetables, such as the *morombida* and *mboiyo*, for these are "loosening vegetables," and are unclean. To deny himself these additions to his daily gruel for a long period is a trying restriction for a Zande.¹

Owing to prohibitions of a medical and political nature, the Azande of the Anglo-Egyptian Sudan may not cross in to the Belgian Congo, and, in consequence, it is no longer possible to observe journeyings in pursuit of the *benge* magic on the British side of the political boundary, and their organization as well as their romance have to be woven together from the recollections of old men and from Belgian accounts. I will commence with a native account told to me by an informant.²

"You consult the oracle about your affair, as 'I am going to dig up *benge*, if I will die on the way *benge* kill the fowl, if I will not die *benge* you spare the fowl.' If *benge* spares the hen, you get together about twenty men. You tell your chief that you are going to dig up *benge*. The chief collects dogs' teeth and giraffe tails and gives them to you. He says, 'You go with these presents and buy the way to the *benge* with them. Thus you go to the chief in the *benge* country and give him the dogs' teeth and giraffe tails and baboon legs. He will show you the way to the *benge* and you listen to him, do you understand?' You go away to this chief and give him a baboon's leg. You tell him that you will drink blood with him, and that if he hides the *benge* from you he will die from the blood, but that if he shows the *benge* to you he will be well with the blood. He says to you, 'All right, sit down, we will drink blood with you.' You drink blood with this chief and he shows you the way to the *benge*. You go with men to the *benge*."

Bishop Lagae says that in the past the Azande did not dare to enter into these hostile and gloomy regions without a knowledge of the tongues of the foreigners. In later times a chief would organise an expedition,

¹ Bishop Lagae has written an article in *Congo*, 1921, Tome 1, on "Les procedes d'augure et de divination chez les Azande." His article is a short one, and although in some respects inaccurate, it was a considerable assistance to me in that I was acquainted with the methods of augury before making enquiries from the natives. In noting the taboos which have to be observed, he says "La non observation de ces prescriptions en leverait au *benge* toute sa force et toute sa valeur."

² I have given this and other native texts in a free English translation, as I do not wish to overburden the narrative with either long texts in the native language or with literal transcriptions.

equip it with presents of ivory and girl slaves and send it into the stranger lands of the south. Individuals, he says, would also make these distant journeys.¹

The accounts which the Azande of the Bahr-el-Ghazal have given me, such as that already quoted, differ somewhat from that of Bishop Lagae. They have told me that several men, often under a *bakumba* or chief's deputy, or under someone who had made the journey before, would club together to make a *benge* expedition. They would then inform the chief and receive his permission for the journey. He would give them presents such as hairs of the red pig and of the giraffe, legs of baboon and dogs' teeth with which to trade.² They used not only to bribe the owners of the soil to allow them an unmolested passage to and from the woods in which the *benge* creeper grew, but also to exchange their presents for the *mamberi*, a broad-bladed knife of Mangbettu workmanship, the emblem of chief's deputyship; spears made by foreign smiths; for the curved knife *zékuda* of the Abarambo and Mangbettu as well as for a red paste procured from the *zali* tree, with which they daub their black hair.

Before going to their chief, the adventurers consulted the *benge*-oracle as to the chances of the journey, whether they would die or whether they would come home laden with baskets of the precious magic root. If *benge* agreed to their project and their chief gave his permission for their expedition and provided them with presents, they set out. Many surprises awaited the new members of the party, the pygmies of the Congo, the artificially-deformed heads of the Mangbettu and their carved wooden figures, whilst the new customs which they observed, the changes in vegetable life and the greatness of the river Wells left lasting imprints on their minds. They will tell one to-day of the ferocity and cannibalism of the Abarambo and how they were greeted with cries of *nombi ! nombi !* (flesh ! flesh !).

¹ Quand le souvenir des batailles était encore vivant les Avongara (chefs) craignent d'envoyer des hommes en groupe pour aller couper le *benge*. . . Les Avongara envoient des individus isolément. Ils faisaient un choix judicieux parmi leurs serviteurs les plus dévoués, au courant de la langue de la région où ils devaient se rendre. Ces envoyés avaient soin de ne point se faire passer pour des Azande.

In all matters which concern the gathering of the *benge* plant, Bishop Lagae was better placed in the Belgian Congo than an investigator can be in the Anglo-Egyptian Sudan.

² There is a considerable difference between these small presents and the slave-girls mentioned by Lagae, and the ivory mentioned by Junker. Junker says that the Chief Mbio sent an embassy to the Chief Ansea to procure *benge*, for which they gave 15 loads of ivory, which to me sounds incredible. Junker, Vol. I, p. 436.

Once in foreign territory they sought out the chief and made him presents in exchange for his permission to collect the *benge* root free from the attacks of the inhabitants. In spite of this protection many parties never came home but were murdered by the Mangbettu and Abarambo. They then sought out men of the country, gave them presents and made blood-brotherhood with them. These men showed *them the way to the dark woods, often near streams, in which the creeper thrives*. The creeper appears to be of two kinds, the *nawada* and the *andehe*, of which the birds are said to eat and die in large numbers from its properties. Lagae describes these creepers thus: "Le *Nawada*, liane de 2 à 3 centimètres d'épaisseur, la racine rouge de cette liane fournit un *benge* qui, réduct en pâte, perd vite sa force et ne peut servir qu'un jour; le *benge andehe* . . . ce *benge* est plus fort que la *nawada*. La pâte en est utilisable pendant deux ou trois jours. C'est aussi le plus recherché."

They dig up the roots of these creepers, clean them, and scrape them with a knife into a powder, which remains for three days in the sun. Rain is always a danger, as a wetting would spoil the *benge* powder, and if the wind is threatening, they remove it to the little hut which they have constructed as a "pied à terre" in the *benge* country. At the end of a few weeks they have collected enough of the powdered root to return home with it in baskets covered inside and outside with the leaves of the banana or of the *ngmongborongba*. They do not carry the baskets on their heads as their hair would fall out owing to its proximity to the *benge*, but they bear them on their shoulders. At the crossing of each river, says Bishop Lagae, the bearers must draw a little water and sprinkle it over the baskets—he quotes a Zande as saying:—

"ka i asi nga hime gbwa
ki he ukidi benge naniya."

"They must not simply cross water, but they must sprinkle the *benge* with it."

On their return, they all make a contribution from their baskets to their paramount chief, and his *Putu benge*, the official consulter of the oracles, will make a trial test. He will ask *benge* if all is well, if the taboos have been observed, and if, indeed, it is true magic they have brought home, and not merely a red powder. If *benge* agrees, then the

chief will send them home, but if *benge* says that the taboos have not been observed, then heavy punishment will await the gatherers.

I have described the collecting of the *benge* magic, but not from observation. Since to-day no one is allowed over the Anglo-Belgian boundary, and since no boundary markets have been established, the Azande in the Sudan find great difficulty in obtaining the magic, and the quantity is always insufficient for social needs. However, men are always prepared to run the risks of a sentence of imprisonment to obtain this powder of such great social value, and a system of "benge-running" has, amongst the Azande with whom I worked, taken the place of the former expeditions.¹

2. (b) THE CONSULTATION OF THE BENGE-ORACLE.

Every paramount chief had two or three *Putu benge*, the regular officiators of the oracle, and the *benge* was always kept in a lonely hut in the bush, under the charge of one of these officials, or under the care of small boys called *awili mvooyo*, little ones in the bush,² the children of Azande under the leadership of one of the chief's small sons.

The *Putu benge* officiates for about a month at a time, and during the whole period he must observe the taboos rigidly. He must have no sexual intercourse, he must avoid all unclean food, the strong-smelling flesh of certain animals, and the putrid flesh of all beasts, and those vegetables which cause wind. In the past, the *Putu benge* sometimes had his testicles crushed on the orders of his chief, so that he would not break the sex taboos.

I wish to emphasise the extreme care taken with the chief's *benge*, the preliminary test of efficacy made with all the newly-gathered magic substance, the isolation of the *benge* hut in the bush, the strict taboos of the *Putu benge*, which made his life during his period of office like that of a man in mourning for death, because, as we shall show later, the chief will consult the oracle officially in matters of public interest, such as war or the offering of first-fruits to God in drought, or in all legal disputes,

¹ How *benge* is of social value is a theme which is developed in the latter part of my paper. Lest, however, it should be thought that I am laying too much stress on its value I quote Bishop Lagae, whose experience of the Azande is great, and who says "En un mot, l'angure est l'une des institutions les plus importantes de la vie sociale."

² Lagae calls them *azaungu*, and quotes a Zande as saying, *i hi songo wa gilo benge, wagila pa kpya*, which means they remain under the taboos of *benge* as under the taboos of death.

whilst the Azande will only consult the oracle on matters of private or family concern.¹ This difference of function will, however, be discussed in a later section.

If a Zande has no *benge* he can usually, even to-day, buy a little or beg a little, or get a chief's deputy to consult the oracles for him. The price of *benge* is high, but it is very difficult to say what price is actually paid, as the whole transaction is in secret, and if anyone has *benge* to-day he will not generally admit his possession of it, as he fears imprisonment. Lagae says that in the Belgian Congo, where there are no restrictions, "Le *benge* a une valeur marchande très élevée. Il n'est pas rare qu'on remette une femme en échange d'un grand panier de *benge*. Une bonne poignée de *benge* se vend actuellement (1921) 1 franc." The price is certainly higher in the Anglo-Egyptian Sudan.

When a Zande and not a chief wishes to consult the oracle, he has to find a man who has kept the taboos, to give the poison to the fowls, and another man, who must also have observed the sex and food taboos, to address the *benge* in the stomach of the hen. This may not be easy, as most men will have either had sexual connection within six days of the morning on which he wishes to consult the oracle, or will have eaten some of the forbidden meats or vegetables within three or four days. However, he will usually be able to find a *boro gila*, or a man who is wearing a waistband of cord made from the inner bark of the *dakpa* tree as a sign of mourning, and who must have observed the ritual prohibitions for the regulated period. A man who had not observed the taboos would not carry the *benge* or even go near it, far less would he think of officiating with it. It must be noted here that the length of the time in which a man must observe the taboos is not rigidly defined and different men will give one different estimates. So that, although sexual connection has been said to be prescribed for six days previous to the oracle, many men will be content if they have been chaste for five or even four days.

There is no rule against the man himself addressing the *benge* or even acting as *Putu benge*. The latter course, however, is very unusual,

¹ The chiefs say that they are not Azande. When I use the word "Azande" in a general sense I shall, however, be referring to chiefs and commoners alike. When I contrast the Azande with the chiefs I shall be referring to the commoners in contrast to the noble clan of chiefs. The context will always make clear in which of these two senses the word is used.

and generally a man asks two friends to act for him. He does not pay them. Having found a man or two men who have observed the sex and food taboos, the Zande can, so long as it is not the day after the new moon, take his doubts with him to have them quieted by *benge*. The ceremony will always take place in secrecy in the bush, either in a clearing made in the grass or in the already cleared corner of an out-of-the-way cultivation. The time of the ceremony is in the early morning, though they will often wait until the sun has dried the grass, as the Zande hates damp.

I will let a Zande describe first what happens when the oracle is consulted.

"They observe taboos for five days. They consult *benge*. That man who has observed the taboos of *benge* goes to consult the oracle. Men capture some chickens to go after him. They arrive at the place of *benge*. The officiator takes a fowl from the basket, places it between his toes, takes the brush and soaks it in the *benge*, opens the mouth of the fowl and pours the *benge* into it. He addresses *benge*, saying, 'Benge, you are *benge*, in the throat of the hen; I will die *benge* kill the hen; I will not die *benge* spare the hen.' *Benge* kills the hen. That is you will die. He takes another fowl saying, 'As I have spoken my affair, I will not recover *benge* kill the fowl. *Benge* spares the fowl.' He goes to his house and sends a man with the wing of the hen to where that man is for whom *benge* killed the fowl.

"It is finished."¹

I will now describe the procedure myself from observation. The *Putu benge* goes on in front with the *benge* to prepare the customary articles necessary for the ceremony. He clears a small space in the grass and then goes and plucks a big leaf, some blades of grass, two oval leaves of the *murwe* tree and some other leaves. He will also cut some branches of near-by shrubs. Water he will have brought with him in a gourd. With these objects he returns to the small clearing he has made in the bush by treading down the grasses, and sits upon the ground. He makes a small hole in the earth, in which he places his big leaf and the *benge* powder on the leaf. He then takes the blades of grass and cuts them

¹ All other texts in this paper were taken down by myself. This one, however, was written by a Mission boy. I have written it as he wrote it, but the description is inaccurate. He should have said "I will recover" and not "I will not recover." Also if, as above, a man were addressing *benge* on his own behalf he would keep the wing of the fowl and not send it anywhere. Accounts by Mission boys need very careful checking.

across in two places, leaving a little bundle of stalks some five or six inches long, which he binds round with another blade. He places this brush on the big leaf near the *benge* powder. He takes the two leaves of the *muwe* tree and, placing one in the other, he cuts the ends of both into a point at tips and stalks. This is for pouring the *benge* into the mouth of the fowl. He takes two other leaves and fastens them together, using the stalks as pins, into the form of a cup, which will be used to transfer a little water from the gourd to the *benge* powder. Next he takes his branches, and with a knife removes the outer covering of bark, leaving the bast in his hands. This he puts on one side to be used later as cord for tying the legs of the chicken. All is now ready, and he sits down to await the arrival of the others who are to be present and who are bringing the chicken.

There may be only one man or there may be several men who have questions to put to the oracle. Each comes with his chicken in an open-wove basket bent in and tied at the top. They follow the *Putu benge* to the chosen spot in the open bush and lay their baskets by his side. One of them, who has observed the food and sex taboos, now goes and sits opposite the *Putu benge* a few feet away from him. This man is the *sima benge*, and it is he who will address the *benge* in the stomach of the fowl. The other men, if they have not observed the taboos, or if they have wives who are in their menstrual periods, will not approach the *benge* but will sit down a long way off, though near enough to hear the words with which the *sima benge* will address the oracle.

They now commence to consult the oracle. The *Putu benge* takes a chicken and, drawing down its wings, he fastens them with feet enclosed between his big and next toes. He sits with the left leg outstretched holding the chicken, and tucked under it his right leg bent at the knee. He lifts the gourd at his side and pours some water into the leaf cup and thence into the leaf basin containing the *benge*. He pours just enough for the *benge*, after effervescence, to form a paste by absorbing all the water. He takes the little grass brush and twirls it round in the *benge*, which adheres to it, and places it on the leaves with ends cut into a point and folds the edges of the leaves together. He holds the grass brush enclosed in the leaves in his left hand and opens the beak of the chicken with his right hand. He tips the end of the leaves into the chicken's mouth and allows the juice of the poison to run down the leaves into

the throat of the fowl. He squeezes the leaves to press all the juice out of the *benge* and, whilst laying the brush on the ground, he bobs the fowl's head up and down to assist swallowing. The chicken remains between his toes, with its rump on the ground, facing him.

At this point the *sima benge*, having been previously instructed as to the facts of the case to be laid before *benge*, begins to address the magic in the stomach of the fowl. Henceforth, until the first part of the ceremony is over, he will continuously address *benge*. After some two minutes of address, the chicken will be given another dose of the poison. If it is a tiny chicken this will suffice, and the *sima benge* will continue to address the *benge* in its stomach. Larger fowls receive three or even four doses.

There is no defined set of words in which the *sima benge* will make his address. Indeed, as he speaks for some five minutes, and as the subjects of consultation vary, this would not be practicable. But the address, nevertheless, runs in traditional phraseology, and these phrases will be heard whenever *benge* is consulted, the rest of the address depending upon the nature of the case. There is no formula.¹

The man who is addressing the magic in the stomach of the fowl must ensure that it shall have all the facts of the case put before it, so that it may reach a decision based on full knowledge. Thus he is careful to mention over and over again the name of the man who wishes to consult the oracle, and he points him out to the *benge* with his outstretched arm. He will also mention the man's name and his father's name and his clan name, and where he lives. So also they inform *benge* of like details concerning any other persons of whom they may speak in the *sima*. They must lay clearly before the oracle all the other circumstances of the case, and exactly what question they require an answer to.

Thus we will take an instance of a man who wishes to marry a girl. I will give an actual case, though the words used in the address are only a précis of the speech actually delivered. The man would not undertake matrimony without the assurance of *benge* that it would be a successful and enduring bond.

¹ I have in this article used the native word "*sima*" or the English word "address" for the speech of the *sima benge*. The words "spell" or "question-spell" might legitimately have been used. The spell in all Zande magic is variable and contrasts with the set-formulae of Polynesia and Melanesia.



The *sima benge* tells the oracle that Zingbondo, of the Ambadimo clan, the son of Perenge, has come to consult it about his marriage. He lives in Ango's country, and wishes to marry Auwa, the daughter of Ngere, of the clan of the chiefs. Linde, of the Avundua clan, the son of Bangbi, has already paid ten spears for the girl, but she does not wish to marry him. She wishes to marry Zingbondo. Well, shall the father of the girl, Ngere, send back to Linde his ten spears and accept the ten spears of Zingbondo instead? Well if he does this, will his daughter die when she goes to live with Zingbondo, or will she live with him for five years, for ten years, always.¹ Now, *benge*, you hear the position, you tell us the truth. If all is well, if Auwa is Zingbondo's wife, you kill the little chicken, *benge*, you hear it, kill the little chicken, chief, you hear it, kill the little chicken

Benge mo gi e imi wili kondo gbia
Benge you hear it kill little fowl, chief
mo gi e imi wili kondo.
 you hear it kill little fowl

But if all is not well, if Auwa is not Zingbondo's wife, if she will die when she goes to live with him in Ango's country, you spare the little chicken, you hear it, *benge*, you hear it, chief, you spare the little chicken.

Mu kusi wili kondo mu gi e benge,
 You spare little fowl, you hear it *benge,*
mu gi e gbia, mu kusi wili kondo
 you hear it chief, you spare little fowl

Now, *benge*, it is a lie, you tell us the truth:

Zile du mu gumba ni lengo.
 Lie is you speak with truth.

There is no witchcraft here (he plucks grass and casts it behind him), you tell us the truth, Auwa is Zingbondo's wife, *benge*, do you hear it, *benge*, you kill little chicken."

¹ Though two questions are asked, whether Ngere shall return the spears of the first suitor and take those of the second suitor, and whether the marriage will prove successful, actually these are all part of the same question and there is no chance of confusion arising.

If Zingbondo was to marry the girl, the spears would have first to be returned to the former suitor and *benge* would have to agree to the newly-proposed marriage. Zingbondo would have obtained the father's consent before consulting the oracle.

It is in this vein that the *sima benge* will address at length the magic inside the chicken. I have given in Zande one or two phrases which occur again and again in the *sima*, terminating each bout of oratory.

Now if *benge*, in the above instance, consents to the marriage by promising its success, for *benge* can see into the past and the future, it will kill the hen. After the last dose of the poison the hen, by this time in a very perturbed state, is taken by the *Putu benge* from between his toes and held in the hand of his outstretched arm. Held by its feet the chicken, overcome by the poison, will often fall backwards, and the *Putu benge* will jerk it forward so that it faces him. The *sima benge*, during this critical minute, presses his address with more insistence, putting the case again to the magic and urging it vehemently and with gesticulation. If the hen is to die, it will soon give a few spasmodic shudders, and then is thrown into the grass, where it expires in spasms.

In this case it is well; Zingbondo can marry Auwa without any doubts as to the future. But if *benge* sees trouble ahead, that Auwa will sicken and die in her new husband's home,¹ then *benge* will spare the hen. For if the hen, held in the *Putu benge's* outstretched arm and jerked backwards and forwards, is not to die, it will show no great signs of distress, nor will it be seized with severe spasms. In this event the *Putu benge* will take a strip of bast and will tie it round the fowl's leg, so that it can easily be recaptured later, and will then toss it to the ground to run about and recover from the poison.

But in this case Zingbondo will not marry Auwa. It is unfortunate, but *benge* knows that only disaster will come from the marriage, for *benge* has seen it looming ahead.

The verdict of the oracle is not, however, final until a second and corroborative verdict has been obtained from *benge*. A complete oracle consists of two tests. The first test described above is called *bambata sima*.² The second test is known as *gingo*. The second test may take place directly after the first test, or it may be delayed for a considerable

¹ My friend, Dr. R. W. Firth, with whom I discussed parts of this paper, suggested to me that the consulter of the oracle had in mind not only the death of his wife but also such defects as laziness, temper, and other forms of incompatibility. This is probably so, but I had not made special inquiry into the question.

² When pressed, a native told me that *bambata sima* was the term for the first test. I am not sure that the term is always or even generally so used. The phrase means first address, and is useful to denote the first test in contrast to the *gingo* or second test.



period. In one instance I have known two years to elapse between the first test and the *gingo*, or second test.

Now, in the *gingo* the action of the *benge* must be opposite to its action in the *bambata sima*. If in the *bambata sima* the hen dies, then in the *gingo* the hen must live. If in the *bambata sima* the hen lives, then in the *gingo* the hen must die. In the *gingo*, or second test, the question is always asked in a negative form. Thus, to take the case already mentioned, in which Zingbondo wishes to marry Auwa. In the first test, as we have seen, *benge* killed the fowl and consented to the marriage. In the second test they will say to the oracle, "No, it is a lie which you have told us,¹ Auwa is not Zingbondo's wife. If you have lied to us kill the fowl, if you have told us the truth spare the fowl." If *benge* has lied, then it will kill the fowl again, if *benge* has told the truth, then it will spare the fowl. If the oracle had not agreed to the marriage in the *bambata sima* and showed its disapproval by sparing the hen, then they would have addressed it in the *gingo*, thus: "*Benge*, you have lied to us, Auwa is Zingbondo's wife. If you have lied to us, then spare the fowl; if you have told the truth, then kill the fowl."

The killing or sparing of the fowl do not give either a positive or a negative answer—that depends upon the form of the question asked.

If *benge* makes two different actions by killing one fowl and sparing the other it is a valid verdict, whether negative or positive; but if *benge* spares both fowls or kills both fowls, then its decisions are invalid for reasons which will shortly be explained.

3. (a) PROBLEM IN THE ADMINISTRATION OF THE BENGE.

There is little chance for the ethnologist to see *benge* by accidentally finding it in operation, as it is always held secretly in the bush in the early morning. The questions asked the oracle-magic are strictly private, and only the consultant's private friends are permitted to be present. But as the ethnologist gets to know a few of the natives well he will find that, so long as he is prepared to observe the rules of taboo and respectful behaviour in the presence of the oracle and does not laugh at its findings, he will soon be able to attend these ceremonies without great difficulty.

¹ In using the word "lie" to translate the Zande word *zile*, it should be borne in mind that the more correct translation would generally be "mistake." It means that the person who is referred to is in error, and one must judge from the context whether he is in error by ignorance or by intention. It is not impolite to say to a man *zile du*, it is untrue.

When he has attended several *benge* he will find that certain problems connected with the administration of the magical root and with the interpretation of its actions force themselves upon his mind. I always asked about these problems either directly after the oracle had finished, or even whilst it was in progress, from the bystanders.

The European who witnesses the administration of the doses of the poison may soon notice that the number of doses given to fowls of the same size vary. Normally, two doses are given to a tiny fowl, three doses to a pullet or cockerel, and four doses to a fully-grown bird. But the observer will notice that the *Putu benge* sometimes gives three doses to one poult, and then on the same morning two doses to another poult of a similar size. Or he gives two doses to one tiny fowl and three doses to another.

Now, at first I thought that the natives were "cheating," and that, wishing a positive rather than a negative verdict, they deliberately "got round" the chains of tradition whilst, at the same time, leaving the procedure intact. I had, however, entirely misjudged the natives, or rather I had read into their culture my own scepticism. For on my suggesting that the *benge* was not being administered properly, that if they gave three doses of *benge* to a tiny fowl, whereas two doses was the normal number, it might be expected to die from the poison, and that if they gave two doses to a poult when three was the normal number, it might be expected to live, I was informed that this was due to my ignorance of the magic, and that however much *benge* one gave to a tiny chicken it would not alter *benge's* verdict. If, for instance, you said to *benge*, "X is ill, if he is to live you kill the fowl, if he is to die you spare the fowl," and the magic saw that X was to die, however many doses of *benge* you gave to the fowl it would still be alive at the end of the oracle.

The discrepancy in the number of doses given to the fowls is due to a certain conventional rule in the administration of the poison and not to any attempt to influence the verdict of the magic. Thus if the *benge* does not seem to have affected the bird at all after two doses, although this is the normal number, they will give it a third dose. For they must see that "*benge na manga kondo*," that is to say that the oracle must be seen working in the hen if there is to be an answer to the enquiry.

On the other hand, if, for instance, during the *bambata sima* or the first consultation of the oracle *benge* kills the fowl so quickly and surely

that the certainty of its answer is made manifest to the observers, although they make a second or confirmatory oracle, the *gingo*, they may only give one dose to the tiny chicken instead of the normal two, as it would be merely waste of valuable *benge* to give it a second dose, since they know that *benge* would certainly spare the second hen since it had previously given so quick and definite an answer by the manner in which it killed the first hen.

It will be seen that by this plasticity of rule it is easier to account for the greater number of valid *benge*, that is to say, *benge* in the first part of which the hen dies and in the second part of which the hen lives, or in the first part of which the hen lives and in the second part of which the hen dies.

It also shows that whilst it would be wrong to suppose that in varying the number of doses the *Putu benge* is trying to "get round" the oracle, it is nevertheless true that the traditionally prescribed procedure of consulting the oracle allows a certain plasticity which the consulter makes use of. Thus if "A" wants to marry a girl and *benge* kills the hen at once, thus giving a certain and favourable answer to the first part of the question (shall "A" marry the girl), he will probably give a dose less than the normal number, since he wishes the hen to live, in the second part of the question (if you have lied to us kill the hen)—but he will be acting quite properly in doing so; whereas if *benge* spared the first hen and thus gave an unfavourable answer in the first part of the oracle, he will probably give the full number of doses in the second part of the oracle, as he wishes the hen to die, and again he will be acting quite properly.

Or to take another example. "A" wishes to marry a girl and consults *benge*, "if the girl is mine, *benge* you kill the fowl, *benge*, you hear it, you kill the little fowl." Now, if the fowl shows no signs of distress at all after consumption of the normal number of doses of the poison but acts as though it had never swallowed any at all, he may give it one more than the normal number of doses on the grounds that the oracle is not in operation. This will probably affect the fowl and possibly kill it, which is the action "A" desires, but he is observing the traditional rules in giving the fowl the extra dose.

On the other hand, if this strange indifference of the hen occurs in the *gingo* or second test, *benge* having agreed to the marriage in the first test,

then he will not trouble to give an extra dose to the fowl, and again he will be acting by the traditional rules in omitting to do so. For the *gingo* has not the same importance as the *bambata sima*, and if *benge* agreed to the marriage in the *bambata sima* it may be presumed to have given a correct answer unless a taboo has been broken or witchcraft has been at work, and therefore the second verdict may be assumed.

Thus in our first problem, concerning the variation in the number of doses (they never vary by more than one dose) we see that in this way traditional usage, by allowing a certain degree of plasticity, gives greater social utility to the oracle.

I may add that without special physiological observations it would be impossible to explain the manner in which *benge* works in chicken. As fresh water is added generally between two tests, and as the poison has been exposed for the period between them, it might be supposed that the poison would be more likely to kill in the first instance and to spare in the second instance. But often *benge* will kill the first fowl, spare the second and kill the third, so that the explanation does not seem to hold. But I have certainly noticed that when there are four or five separate questions to put to the oracle the natives are inclined to ask all the *bambata sima* first, and afterwards all the *gingo* instead of alternating them. In this case the physiological working of *benge* might be expected to give a larger number of valid verdicts than if another method was adopted. However, this point has only occurred to me when writing up my notes, and I have made no special observations in the "field" to elucidate it.

There is a section of *benge* root in the British Museum, which has been marked strychnine by the donor.

I shall have to make a short digression to discuss whether *benge* is to the native a poison at all. We have seen that the native will tell us how birds eat the flowers or fruit of the *benge* creeper and die from the effects. Also we shall see later that the natives will sometimes be heard to discuss whether their *benge* has deteriorated with age. Also any Zande will tell us that if we were to give a fowl which had died in the oracle tests to a dog, or if we were to eat it ourselves, the dog or we would die. These statements lead us to suppose that the Azande regard *benge* as a poison in our sense of the word rather than as a "magic."

However, I was once, with some freedom of imagination, trying to explain to a native that we, like themselves, have two kinds of "medicine" which would kill men, and that to the first of these the white man's Government had no objection; for example, the blowing of a magic whistle whilst uttering a spell. On the other hand, the white man's Government had strong objections to the second kind of "medicine," which you could just put in the victim's food or beer—as for instance, I ventured to suggest, if a Zande put a handful of *benge* into a man's beer. The native replied at once that if you did not utter the *sima* (spell) the *benge* would not kill him. Whenever afterwards I put this question to a native whether, directly or indirectly, "would *benge* kill without the *sima*?" I received the answer "No."

When I publish my full notes on magic I will show how many "medicines" which work naturally, such as the lethal medicine of the hair of the red ant-eater, which is placed in the victim's beer and sticks in his throat, or such as the fish-poisons which are used to kill fish in a pool, are all accompanied by the spell (*sima*) and the taboos (*sino*), and the traditional procedure of the magic without which they are useless.

It will be seen that the statements of the natives that *benge* does not kill in a natural manner but by the aid of the spell is contradictory to their knowledge that birds and dogs die from it and that it loses its power through age. Such contradictions are frequent in native thought, and we must not attempt to exclude them for the sake of symmetry.¹

I will suggest finally that the native in many of his customs and beliefs possesses knowledge which is sufficient to enable him to see that many of his beliefs are erroneous. The contradiction between knowledge and stereotyped and socially prescribed beliefs is common enough in our own society, and the process by which they are both kept intact is well known to psychologists in the phenomenon of dissociation. However, I hope to deal with this question in another place.

3. (b) PROBLEM IN THE INTERPRETATION OF THE ORACLE.

A second problem which arises from a descriptive account of the oracle is how the native under certain circumstances interprets its findings. The observer would be unlucky if he watched half-a-dozen *benge* and did

¹ It is commonly asserted by Europeans that the Azande are possessed of numerous malignant poisons. However, I believe these assertions to be quite incorrect.

not notice that on occasions *benge* will spare the hen which is then tied by the leg with the bast of a tree and let loose to run about in the grass, but later is found to have expired in spasms. To my knowledge the contrary never occurs, a hen which has fallen as though dead never revives.

When this happens the native is somewhat perplexed, for above all he likes a clear answer to solve his doubts and to decide his course of action. Whereas if *benge* first spares the hen and then kills it after the oracle has been given and accepted, he is once more thrown into doubt and indecision.

The first time I saw this doubtful oracle occur was in the case of a youth who very much wanted to marry a certain girl. In the first test *benge* spared the hen and gave a verdict against marriage. The boy was very distressed and those present condoled with him. In the second test, however, when the oracle was directed to give a confirmation of its previous verdict, it spared the hen again, that is to say that it contradicted its previous decision. This contradiction, as will be explained later, was considered as being probably due to witchcraft, and the oracle was consulted a second time, its first statements being regarded as null and void. In the second oracle, *benge* consented in both tests to the marriage. The youth was delighted, but on his return home the fowl spared in the *gingo* of the first oracle died from the after effects of the poison. Its earlier death would have meant a clear decision against the marriage, and the boy was uncertain how its belated death was to be interpreted. He consulted the older men, who said that it would be correct for him to marry as *benge* had given a contradictory decision at first, and this contradictory decision held good even if the chicken died later. But the youth was not satisfied, dread of the death of the girl if he married her, with all its unpleasantness and expenses, was too great for him to rely upon oracles in which there was any degree of doubt. He must have a clear decision before he undertook the marriage, and he determined as soon as possible to consult *benge* again.

I have seen several instances such as the one just quoted, and I have reached the conclusion that, according to native opinion, when *benge* acts in this manner it is because it must give a reply to the question as put to it by the *sima benge* in his address, but also wishes to say that it sees something outside the question. The native is not therefore satisfied

with a verdict of this nature, even where it is in his favour. *Benge* sees something, he may not know precisely what, which modifies its answer. He came for a clear lead from the oracle and he has received a modified verdict to his question. His doubts are not dispersed, and he will consult the magic again, after some days or weeks, for a clear answer.

3. (c) THE PROBLEM OF CONTRADICTORY VERDICTS.

To give a valid verdict *benge* must kill one hen and spare the other. If it kills both hens or spares both hens then its verdict is null and void. I do not know how it is that some hens die from the effects of *benge* and that other hens survive the poison, but it might be surmised that frequently it kills both fowls or that both fowls survive, and such a surmise would be correct. This is very annoying to the native, because he has gone to considerable trouble and expense for no purpose whatever. He is not nonplussed, however. For one of three reasons *benge* has lost its magic—it may be too old, or a taboo may have been broken, or witchcraft may have been in play.

About the first explanation little comment is needed. The *benge* has been kept too long, and they must procure fresh *benge* to consult the oracle again. Age is sometimes given as a reason for the failure of *benge* to give a clear verdict if in the first three or four questions of the morning it fails to kill a fowl.

More serious is the breaking of a taboo. To understand this explanation of *benge*'s deterioration it is necessary at the outset to grasp a fact, to be laboured again later, that *benge* is not to the native a "natural force" which can distinguish between truth and error, nor is it simply a powdered root which, when mixed with water, will sometimes kill domesticated fowl and will sometimes fail to kill them, and that as the fowl dies or lives so the natives agree to abide by the verdict. *Benge* is not a "natural force" at all, nor do I believe that it is regarded clearly and consistently as a poison capable of causing death by natural means. Nor is its trial upon a chicken a matter of luck by which they agree to abide. It is a treasured cultural possession, the knowledge of which was given to the Azande by God (*mboli*), which gains its magical power, the power which enables it to inform men about events in past and future hidden from the human mind, by its being gathered and kept by men who have observed all the restrictions of the food and sex taboos, and by

its being administered by the traditional procedure. If these taboos have not been kept, then *benge* is not "*benge*" at all, it is just a powdered root of a forest creeper found in the wooded regions to the south of the Welle river.¹

I cannot do better than let Bishop Lagae, my predecessor in the study of Zande customs, state the native view-point. Says he: "Le *benge* n'a donc de valeur aux yeux des Azande, que s'il est pur, indemne de toute souillure, cueilli et conservé avec toutes les prescriptions rituelles. Dans ce cas seulement il peut donner un oracle véridique. Si l'on n'observe pas ces prescriptions, le *benge* n'est qu'une poudre rouge vénéneuse, inapte à distinguer le vrai du faux, la culpabilité de l'innocence. L'observation des prescriptions prohibitives fait partie de son entité réelle. Le *benge* n'est spécifiquement du *benge*, que dans l'hypothèse où sa force n'a pas été étouffée par la non observance des prescriptions rituelles. En dehors de ce cas, le *benge* ne distingue rien, il ne dit pas la vérité" . . .

To-day, when all *benge* is acquired by an illegal and heavily punished system of "*benge*-running" between the British and Belgian possessions and exchanges of spear-money and goods for the magical substances have often to take place quickly, in secret and at night, it is not always possible to test the *benge* by a trial oracle. In consequence, the Zande traders of the Belgian Congo have not always observed the taboos of abstinence incumbent upon anyone who touches the *benge*, and the purchaser in the Sudan finds that he has been swindled, for instead of receiving a precious magical substance he has received a worthless red powder. He discovers this too late, when consulting the oracle. I have twice seen large quantities of this useless powder, purchased at considerable cost and at risk of imprisonment. It had to be thrown away as it was not magic, and as there is no means of rehabilitating the powder with magic. The breaking of a taboo is sometimes the explanation put forward if contradictory verdicts are given by newly-acquired *benge*.

A grasp of this fact, that *benge* is not a natural force, but is magic, or a cultural force, will also help us to understand the third possible and more generally accepted explanation of its failure to record valid verdicts.

Benge may be defeated by witchcraft—that is, the purpose of one great human possession may be defeated by another great human possession

¹ *Benge* should not be regarded as being in any way personified.

The White Magic of *benge* acquired by the perseverance and courage as well as by the self-sacrifice and abstinence of man may be negated by another heritage of man handed down by him from generation to generation, Black Magic. Reference to *mangu* (witchcraft) is usually the explanation given to account for the contradictory verdicts of *benge*.

In this case the consultation of the oracle will have to be abandoned upon that issue. However, it need not follow that witchcraft will interfere with other issues, nor that it will interfere with the question in hand upon another day, or even upon the same day, if the baneful influence of Black Magic has passed.

A fourth possibility may be mentioned here, but as it only arises in legal disputes, it is discussed more fully under the heading of "*Benge* as Legal Machinery," towards the end of this paper. Some men, very few, possess a type of magic, called *Zelengbondo benge*, which is able to influence the magic of *benge* so that a false decision is given in their favour.

3. (d) ACCEPTANCE OF VERDICTS.

As will have been seen from my account, the Zande puts his full trust in *benge*. For him it is a great heritage and he will often tell one :—

benge na gumbanga zile te, ga ani waraga du
benge does not speak error of us paper is,

benge does not err, it is our paper, for the native has learnt that the European is accurate because of his paper.

We have also seen that the findings of the oracle are, as it were, "fool-proof," and that whatever happens in the oracle-consultation, has its explanation at hand. Other oracles may make mistakes, but *benge* never. But it will naturally occur to the white man to ask what happens when the oracle gives a verdict which subsequently is proved to be wrong. Now, although what we have to say on this point also applies to a lesser degree to the other oracles, it had better be dealt with briefly and at once

Firstly, most oracles of *benge* are given about questions to which its answers cannot well be proved incorrect, for, in the case of one answer, the enquirer never makes the test, whereas, in the other case, the findings of the oracle are largely in accord with the workings of nature. Thus, if a man says to *benge*, "I shall build my homestead in this place, will I die?" and the oracle says, "Yes, you will die," then the native is not

such a madman as to take the risk, so that its verdict is not tested. On the other hand, if *benge* says, "No, you will not die," the probability is that *benge* will be usually right, because *benge* is speaking of the next few years and cannot be expected to vouch for the distant future.

Secondly, the questions which are asked of *benge* are mainly stereotyped; they occur in set social contexts. A Zande would not, for instance, ask of *benge*, "Will I kill meat if I go out hunting to-morrow?" This is not one of the questions which one puts to *benge*.

Thirdly, were *benge* proved in error by a test case to the White Man, to the native it would be an instance of witchcraft. For example, if *benge* said that "A" had killed "B" by *mangu* (witchcraft) and "B's" relatives killed "A" in revenge and then cut his stomach open and found no *mangu* (which is always located in the stomach), then I think that they would say that witchcraft was present at the oracle. I suppose that such cases do actually occur; but if you ask a native what they would say in this event, he will always tell you that such an example cannot occur, for if *benge* says that "A" is a witch, then, on opening his stomach, you will find *mangu*. It is one of those many questions which seem so stupid to a native wherein the White Man asks what would happen if such and such a thing occurred when, in his opinion, such and such a thing never does occur.

3 (c) ANALYSIS OF THE MAGIC.

Before I go on to describe other methods of augury, I will make a short analysis of the morphology of the *benge* magic, showing what are its essential characteristics:—

- (1) THE TABOO.—It has to be gathered and kept and afterwards consulted under strict taboos of sex and food. If one of these taboos is broken, *benge* ceases to be magic.
- (2) TRADITIONAL PROCEDURE.—*Benge* must be consulted in the traditional manner—the withdrawal to the bush; the stereotyped mode of mixing the *benge* paste and of administering it to the fowls; the regulated number of doses; the *sima* or long address to the magic; the *gingo*, or second and confirmatory part of the oracle; the prescribed mode of interpreting the action of the magic on the fowl.
- (3) SOCIAL CONTEXT.—*Benge* is not consulted haphazard upon all matters, but always in certain stereotyped social contexts.

This I consider to be the most important aspect of our subject, but its discussion is postponed till later in the paper, so that the social custom of all means of divination described in this paper can be treated together.¹

It may also be especially noted here that the magic of *benge* is known to all, and that all who possess the powder by purchase, loan, gift or by any other means of acquirement, can use the magic, and that any male, small boy or old man, or adult, may administer the *benge* so long as he has observed the food and sex taboos, and all have the opportunity to acquaint themselves with the traditional procedure. Women, however, are excluded.²

They are not even allowed near the magic for fear of depriving it of its powers. *Benge* is not, therefore, an "owned magic," and the only restriction upon its use is that of sex.

(4) (a) DESCRIPTIVE ACCOUNT OF THE DAKPA ORACLE.

We shall now proceed to the description of another method of augury, that known as *dakpa* (*sorokana dakpa*—consult oracle with *dakpa*). The procedure of the augury is very simple and its description will be brief. Moreover, I have only seen the oracle in use once, and my information is neither full nor well checked. It may be supplemented, however, from Bishop Lagae's account.

A person who wishes to consult the oracles upon some important matter and he cannot obtain *benge*, or upon some less important affair, or often as a preliminary to *benge*, will consult the "white ants" by placing branches from magical trees, the *dakpa* and *kpoiyo*, in an ant-hill and seeing which of the two the termites will eat.

This method of consulting the oracles is very popular amongst all Azande, especially amongst women, partly because it costs nothing and is simple, needing no elaborate apparatus such as *benge* necessitates, and partly because it is reliable. Many methods of augury require human agency to manipulate them or are themselves a form of human activity.

¹ See page 39 ff.

² Actually there is a woman in Ngere's country who practises *benge*, but she is the only one I have heard about. As far as I can remember she is a widow who lives by herself. The reason given to me for the exclusion of women was that it must be assumed that women will always have had sexual connection with somebody, if not her husband. This, however, was only the statement of one man—possibly a cynic.

This, the Azande realise, has its drawbacks ; whereas the ants, as they say, do not listen to all the talk which is going on outside in the homesteads, but only hear the question put to them and will give an unbiassed verdict.

The oracle must be consulted under ritual restrictions. The observances are less strict and less clearly defined than those governing the procedure of *benge*. No one would be so stupid as to consult the termites on the day after he had had sexual intercourse or on the day after he had eaten the *mboiyo* or *morombida* vegetables or smelly flesh such as the elephant or fish, or indeed any meat kept for two or three days and inclined to smell. But still many men would risk consulting the oracle if they had abstained from such forbidden foods for 24 hours. Others would prefer to allow two days to elapse after indulgence in the tabooed foods or sexual intercourse. Also most men would be content if they abstained from the more risky dark-skinned animals such as the water-buck, the wild pig and the eland, whilst others, more careful, will extend their range of restriction.

They always consult the termites in the evening towards sunset. The man will go to a termite-hill near his home and one which he knows has not been deserted by the termites. He will not take branches of the *dakpa* and *kpoiyo* shrubs with him, as these are very common and he will be certain to find them near the termite-mound, but, arrived at the mound, he will look round for these two trees and will cut a branch from each. Then, taking the iron-hafted shaft of his spear, he will dig in the top of the hill and remove the surface earth, thus exposing the blind termites which much resent this disturbance. He will be careful to avoid their sharp claws, and will look for one of those big downward-running tunnels which are found in these hills, and he will take one branch in one hand and the other branch in the other hand, and on seeing the termites :—

<i>i</i>	<i>na ya</i>	<i>we</i>	<i>ako</i>	<i>angbali</i>	<i>u</i>
They	say	thus	oh	Termites	he
<i>akpi</i>	<i>gi</i>	<i>gana</i>	<i>dakpa</i>	<i>li</i>	<i>u</i>
will die	this	year	dakpa	eat,	he
<i>ekpinga te</i>		<i>kpoiyo</i>		<i>li</i>	
will not die		<i>kpoiyo</i>		eat.	

This is what a man will say in addressing the termites if he has come to consult about a sick friend as to whether he will live or die. When he has addressed the termites, he places the sticks, one in each hand, into the tunnel and there leaves them, placing a few lumps of termite-earth round them, and returns home.

He digs a hole in this manner if he is to consult the termites called *akiedo* and the termites called *abariba*; but if he is to consult the *abio* and *ngbaiimo* termites he will not dig a hole, but will simply place the branches on the path near the termite-hill, on that side where he sees that the termites have a run.

Early next morning he will go to the termite-mound to see whether they have eaten the *dakpa* and left the *kpoiyo* or eaten the *kpoiyo* and left the *dakpa*, or whether they have eaten both branches or have eaten neither of them.

If they have eaten the *dakpa* alone it is invariably a bad omen. In answer to the *sima* above it is a reply that the sick man will die this year. If the termites have eaten the *kpoiyo* alone it is invariably a good omen. In answer to the *sima* above it means that the man will not die this year. In either of these two cases the oracle should be consulted again, this second consultation corresponding to the *gingo* in the *benge* oracle. I believe that the same form holds for both, so that if the termites have eaten *kpoiyo* in the *bambata sima*, then they must eat *dakpa* in the *gingo*. When the *gingo* is held it will take place preferably in another termite-hill, as it is not wise to ask the same termites too often or they will not give an oracle at all.

If the termites do not eat either of the two branches, then the Zande says *ami na ka ka*, "they are doubtful," and therefore will not give an answer, or even that they just do not wish to give an answer. In this case the man will go another night to a different termite-hill and repeat the *sima* and procedure of augury.

Or it may be that the termites will eat both the *dakpa* and the *kpoiyo*. Lagae says that in this instance "Si les deux bâtons sont rongés inégalement, la présomption penche du côté de celui qui a été rongé le moins. Si donc le *kaow* (*dakpa* ?) est attaqué moins que le *kpoiyo*, l'augure est plus ou moins favorable d'après la différence qu'on constate." I was told that if both shrubs were eaten then the oracle

was invalid, and that this might be due to the breaking of a taboo, but that it may more generally be attributed to witchcraft, or that it might just be due to the fact that the ants were hungry and were more intent on satisfying their hunger than answering the oracle.¹

If the Zande considers that it is Black Magic working against him he will be very angry and consult first the *iwa*, another process of augury presently to be described, and then *benge* as to who is using magic against him, and when he has discovered the name of the man he will ask a friend to take the *dakpa* and *kpoiyo* branches with him to the owner of the witchcraft. He will ask him why he wishes to do ill to the man who is consulting the ants, and will get him to blow water on to the *dakpa* and *kpoiyo* to remove the black magic before a new attempt is made to address the termites.

It seems, however, that some men lose faith and temper with the particular ants of a termite-hill, and after they have eaten both *dakpa* and *kpoiyo* twice, he will then proceed to give them the branches without first pronouncing the address (*sima*). If they eat both again he believes that he has "scored off" the ants by deceiving them. He says that they just eat because they are hungry and have not listened to his question.

If a man has not observed the taboos he may consult the oracles by proxy. A boy will go with him and will cut the *dakpa* and *kpoiyo*, will place them in the path or within the termite-hill, and will address the termites. Next morning, however, the man himself will come and see what verdict the termites have given him.

Whilst the branches are in or near the termite-hill the consulter of the oracle will not talk about the affair at all, as to do so might disturb the termites and involve a wrong verdict. Also when the verdict has been given it would be highly improper to throw away the pieces of branches into the bush. They will be taken home and placed in the roof of the hut or in the verandah, or, better still, in one of the ancestral shrines, where the visitor to a native homestead will often see them. If a man, who had received a favourable omen about a future event, were to throw away the *dakpa* and *kpoiyo* sticks, he might easily affect the manner in which the event will actually turn out.

¹ Here again we have a rational reason amongst irrational ones just as in *benge* age as well as the breaking of a taboo and witchcraft was a reason for the invalidity of the oracles.

4. (b) ANALYSIS OF THE MAGIC.

We shall now, as with *benge*, make a short analysis of the main characteristics of the magic of *dakpa* :—

- (1) THE TABOO.—As in *benge*, the oracle must be carried out under the observance of taboos. If the taboos are broken the termites will not give a valid verdict.
- (2) THE TRADITIONAL PROCEDURE.—The oracle must be consulted in the stereotyped manner, namely, at nightfall; with the *dakpa* and *kpoiyo* and with no other tree; with the correct type of *sima*, corresponding with the exact method of inserting the woods; the prescribed means of interpretation of the action of the termites must be used.
- (3) SOCIAL CONTEXT.—This must be left for discussion in conjunction with other methods of oracle-takings, when its importance will at once be seen.

Here again, as with *benge*, the magic is known to everyone, and everyone may consult the termites without payment. In the case of *benge* there was an actual bar to women using the magic. In the case of *dakpa* this is not so, and the magic is very widely used by women in their affairs owing to its ease and cheapness. Even children ask the termites about their little troubles.

5. (a) DESCRIPTIVE ACCOUNT OF THE IWA ORACLE.

In many ways the next type of oracle to be described is the most interesting. In *benge* appeal is made to a magical powder administered to hens. In *dakpa* appeal is made to the termites. Whereas in *iwa* appeal is made to a small wooden instrument into which magic has been rubbed, and which is made by man and worked through his agency. All Azande agree that it is not so reliable as *benge* and *dakpa*, "*iwa* makes many errors," they say. But then it has one great technical advantage over *benge* and *dakpa*, for they can only answer one question, and in the case of *benge* there is the cost of valuable magic powder and two fowls, and in the case of *dakpa* the oracle takes a whole night to function, whereas "*iwa* tells many matters."

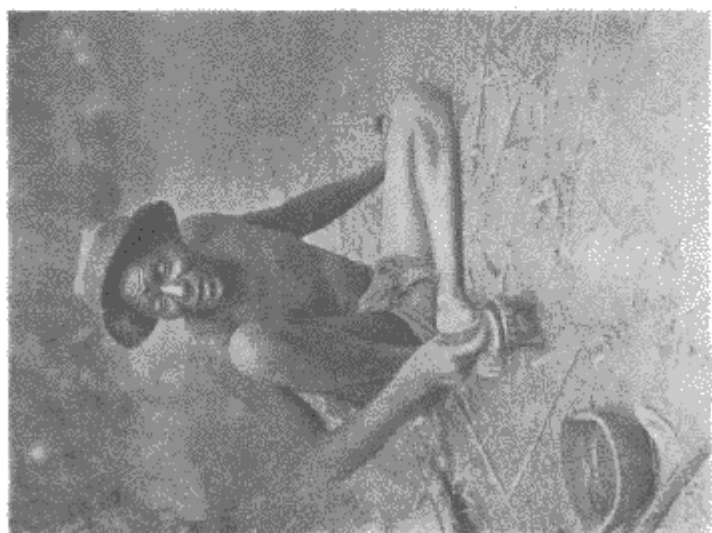
For instance, if a man thinks, as he generally will in any misfortune, that someone is injuring him with black magic, he can always consult

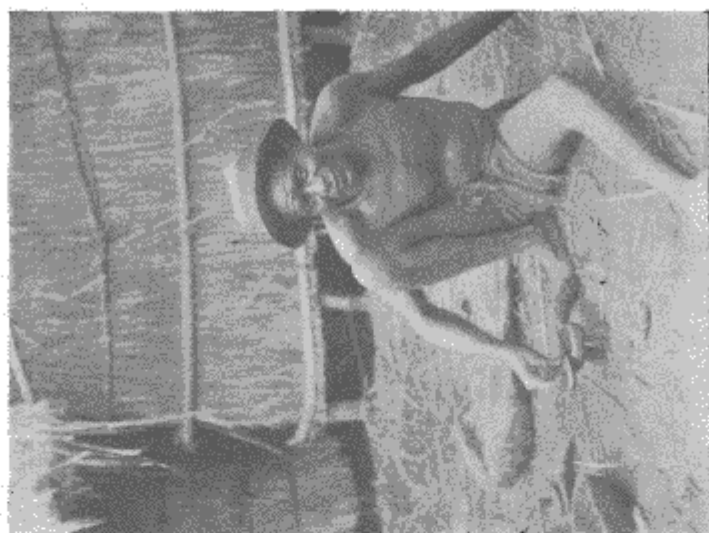
benge or *dakpa* or both, and receive confirmation or rejection of his suspicions. But he cannot very well go through all the names of the people whom he thinks may be injuring him to discover whether each one is using black magic against him by these long and, in one instance expensive, methods of augury. This is where the little wooden instrument *iwa* comes in useful. He can run quickly through the names of suspected users of Black Magic, and having discovered by this means the responsible individual, he can either inform him or, if he considers the affair important enough and wishes to be on sure ground, he can first check the verdict of *iwa* by using *dakpa* and checking *dakpa* by consulting *benge*. For the different oracles have their order and system, and one always consults *iwa* before *dakpa* and *dakpa* before *benge*, and never in a reverse order. *Benge* is always final.

The *iwa* is a miniature table-like construction; it is carved out of the *doma* tree, so often used in magic, or from the *kukurahu* tree. It is cut from one piece of the tree and has a round or oval flat surface, incised with knife-cuts, and is supported by two legs and a long tail. It stands about six inches high, and in length is from six to twelve inches. The instruments vary in size. The two legs are called *undu hu*, its legs, and the long tail, which is used as a handle in manipulating the instrument, is called *sa ha*, its tail. Over the table-like surface of the instrument is fitted a little round head, to which its flat surface is neatly proportioned. A barkcloth covering is tied over the head of the *iwa*. The *iwa* is also sometimes called *gbaga* and *bulu*, though I am not certain whether these are the names of trees or not. The main piece of the instrument is called *na ha* (its mother), and the movable head is called *wi-li* (child).

While the instrument is being made, from the moment when the man goes into the bush to look for a suitable tree from which to carve the *iwa* with an adze, he should observe the taboos of food and sex, as we have seen in the cases of *benge* and *dakpa*. He must avoid sexual connection, the eating of pungent flesh, and loosening vegetables.

Lagae says that after the wood has dried in the sun he will take some gum which flows from the *kpai* and pluck a small shrub, called *banzwa*. He burns the *banzwa* and mixes its root with the *kpai* gum, and rubs this carefully over the *iwa*, and then places on it the wooden lid-head and binds it round with barkcloth. It must be placed apart for two or three days where no one who has not observed the taboos will touch it;





after which it may be used. To use the *iwa*, it is necessary to have observed the restrictions with regard to women and food. A man must not have had connection with a woman for four days previous to manipulating the instrument, and he must not have eaten fish nor elephant flesh for a like period, nor *mboiyo* and *morombida* vegetables for two days. However, these periods of abstinence are variable.

Lagae says: "On peut néanmoins se libérer des prohibitions alimentaires par la précaution suivante: on calcine un morceau de viande d'éléphant et on frotte le *iwa* avec les cendres. On peut faire de même pour le poisson. Cela se fait une fois pour toutes." This practice is unknown amongst the Azande of the Bahr-el-Ghazal, perhaps because they very rarely see the flesh of elephant or fish.

Bishop Lagae also says that the Azande, in the Congo, having taken off the cord and cloth, previous to manipulation, scrape the bark of the *mbugare* with a knife on to the surface of the *iwa* already smeared with the gum of the *kpay*. Others use the cinders of the *willizaganduhu*, a little thorny brushwood which grows on the termite-mounds. Both of these substances cause a froth on the surface of the *iwa*, and such a froth must be raised for proper usage. He says that these are only two of the many medicines used for this purpose.

The Azande of the Bahr-el-Ghazal use the small yellow fruit of a wild tomato, *gbakatuna*, which they squeeze, or the twigs of the *yudepia* tree, which they grate with a knife on to the table.

Then they take the head of the *iwa* and dip it into a gourd of water and apply its flat bottom to the table-top of the *iwa*. The moment the water touches the medicine squeezed or grated on the table, it causes it to froth and bubble violently.

This is the moment for usage. The operator sits down with his legs bent and his right foot resting on the handle or tail of the instrument to keep it steady whilst he uses his right hand to take the head of the *iwa* between his thumb and first finger, firmly, and to make a few preliminary jerks which send the head slithering easily over the table. The question is now put by the operator to the oracle. He taps *iwa* on the head and says, perhaps:—

" <i>iwa</i>	<i>mi</i>	<i>akpi</i>	<i>gi</i>	<i>gana ?</i> "
" <i>iwa</i>	I	will die	this	year ? "

He then makes short jerks with his right hand, and the lid will either slither easily over the table of the *iwa*, in which case the answer is "No, you will not die this year." or the lid will stick, and no amount of similar jerks will remove it, and it has eventually to be pulled upwards with considerable force, in which case the answer is "Yes, you will die this year." That is to say, that if the lid sticks the answer is in the affirmative; if the lid does not stick but slides easily, the answer is in the negative.

Or the little lid may run about from side to side and round and round instead of going straight forwards and backwards. This means that the oracle is uncertain: "*Si na ka ka*" they say.

Strictly speaking, as in *benge* or in *dakpa*, a second and confirmatory trial should be made. In this case he will ask, if the lid has stuck in the first trial signifying that the answer to the question "Will I die this year?" is "Yes," the question again in a negative form. "It is untrue, I will not die this year?" The wood runs smoothly backwards and forwards giving the confirmatory verdict of "No," that is, "No, it is not untrue you will die this year." Just as in *benge*, if the first hen dies then the second hen must live, or *vice versa*, if the first hen lives then the second hen must die, for the verdict to be valid; so in *iwa*, if the first jerks with the lid result in sticking, then the second series of jerks must run smoothly backwards and forwards, and, conversely, if the first series of jerks make the lid run smoothly, then the second series of jerks must result in a sticking of the lid, for a valid verdict.

Strictly speaking, this is the correct procedure, but in daily use one of the oracles is generally held to be sufficient and the next question is then asked. This omission of the second part of the oracle is partly due to the fact that in all very important matters the confirmation of *iwa* is sought by *dakpa* and by *benge*, and partly owing to the fact that the second trial invariably upholds the verdict of the first trial for a reason soon to be given.

Thus, in contrast to the lengthy processes of *benge* and *dakpa*, *iwa* gives the oracle in a few seconds, and a large number of questions dealing with a variety of subjects can be answered quickly in succession.

There will often be two or three persons near by when the *iwa* is being consulted and each will take the opportunity of consulting the oracle about their affairs. One will want to know who has been using witchcraft against him resulting in a sore foot, another who has been

preventing him from killing animals by witchcraft, another who has been using the same malign power to hinder his wife from having children ; for *iwa* is "par excellence" the oracle for discovering the *boro mangu*, or witch. Marriage affairs, journeys, illness and many other matters will similarly be asked.

Whatever questions a man wishes to put subsequently to the oracle, generally he will, as a matter of course, begin by asking : *mi akpi gi gana ?* (I will die this year ?) or simply *mi akpi ?* (I will die ?) Such a question has a traditional technique of its own. The operator plucks a few blades of grass and makes with them a circle in the air, just above the earth, to indicate a grave to the *iwa*, and then casts the grass behind him, before working the magical instrument.

At this point I had better draw attention to the fact that the *sima* is not always spoken to the instrument directly. When the man who is manipulating the instrument wishes to address it he taps it on the head and asks it the question. Often, however, the man who is manipulating the instrument will not address the *iwa* which hears the question put by the enquirer to the manipulator. On the other hand the manipulator will often make a long address to the *iwa*.

I will now give an example of a consecutive series of questions concerning the same affair, which were asked at an oracle consultation at which I was present.

The wife of Zingbondo, the son of Bagbe, both father and son being chief's deputies, wished to consult *iwa* about her daughter, who had refused to marry her espoused husband, had been beaten by her father for this obstinacy, and had, much to her mother's anxiety, run away from home and had not been seen for two or three days. The first question put to the *iwa* was, "Is the girl dead ?" The lid went smoothly backwards and forwards giving the answer "No." She next asked, "Has the girl gone to stay with relatives ?" The lid stuck and refused to move to the operator's jerks, thus giving the answer "Yes." She next asked, "Shall I go and try to find her ?" The *iwa* answered "No." Her last question was, "Will she return home within three days ?" The lid stuck, giving "Yes" as an answer. The oracle was consulted in the afternoon and the girl came back to her mother the same evening.

This example gives us an excellent illustration of the somewhat wide questions put to the *iwa*. Having been informed by the oracle

that the girl had run away to her relations, I suggested we should ask it which relations, giving the names in turn of those who lived near. I was, however, informed that this was an improper question to ask *iwa* and that the oracle could not be expected to know the affair in such detail. In the same way no native would have asked *iwa* whether the girl would return to her mother to-morrow. They will always ask a question of this nature to within two or three days. I have seen a large number of *iwa* oracles, and when I was able to follow the questions in the native language I found that they were always of this general wide nature. I used to test this opinion by asking straightforward narrow questions, such as the native does not ask. For example: "Will it rain to-morrow?" or "This afternoon I am going to see the chief Gangura, will I find him at home?" or "I am going out shooting to-morrow, will I kill meat?" The answer to these questions was usually, "I do not know," that is, the head of the *iwa* went from side to side and round in circles; whereas if I asked a general question, such as the native always asks, I invariably received a straightforward oracle of "Yes" or "No," and usually the subsequent event proved it to be a correct one. It must be remembered that unless the questions were put in a stereotyped form, as in *benge*, the oracle would lose its social utility.

THE PROBLEM OF CHEATING.

I have not the slightest doubt that the operator of the *iwa* cheats. Firstly the second confirmatory oracle, unlike *benge* and *dakpa*, invariably supports the previous verdict. This, in itself, is convincing enough. Moreover, the answers are always given in accordance with the findings of a reasoned consideration of the questions asked; that is to say that the *iwa* answers "Yes" or "No" just as I should have answered when, knowing all the relevant facts, I had made a decision on the grounds of probability. I used to test this when watching the oracle upon many occasions by making a quick judgment on the grounds of probability and by seeing whether the oracle agreed with my conclusions.

Also, having learned to use the instrument, I have discovered that it is possible to regulate the movements of the lid on the table-surface of the *iwa* by means of pressure and the manner of jerking the lid in such a way as to make it go round or from side to side or straightforward or stick firmly. Such cheating is beyond detection by the observer.

Now, if the operators do intentionally cheat it must be borne in mind that they do not cheat themselves but other people, which, of course, is quite a different matter. Only a small percentage of the population are possessors of the *iwa* and, though they may oblige their friends by consulting the oracle free, they may normally expect a small payment before they begin to operate the instrument. If this small source of income is to be kept, their *iwa* must have a local reputation for the correctness of its oracles, and I am convinced that the owners regulate the oracles in accordance with a reasoned judgment of what will in all probability happen.

At the same time I should not like to say how far this "cheating" is "unconscious," that is how far the nervous jerkings of the instrument, held between the thumb and forefinger, and the mental reaction in the mind of the operator to the question which he has just heard, work in concord without the intermediate mental process (as "I must make the lid stick") corresponding with the purposive manipulation of the instrument. This is a very difficult problem. I believe that the owner of the *iwa* also consults it about his own affairs.

Naturally the question of cheating is a very interesting one and I made many enquiries into it. The observer will soon realise that such oracles as *iwa* which function directly through human agency and still more those oracles, not described in this paper, in which man himself or the spirits are the source of inspiration, have a place in native culture far below the greater oracles which function through non-human agency, such as *benge* and *dakpa*.

To what extent does this cultural arrangement of the oracles in order of merit correspond with the individual's outlook? Every Zande will tell you that *iwa* is in no way reliable, like *benge* and *dakpa*. It has to give so many oracles and sometimes an *iwa* will make mistakes. They will also all admit, if asked directly, that some operators cheat but that no good operator will cheat and if a man did so his *iwa* would not tell him the truth and no one would go to it for an oracle. Their answer amounts to no more than that they know that it is possible to cheat but that people do not normally do so. Their reaction to the question is quite different from their shocked negative to the question whether a man would cheat with *benge*.

But only some *siwa* (plural of *iwa*) make errors, others will always be correct. The correctness of an *iwa* depends upon the instrument not becoming cold (*zele*)—(that is, lose its magic), and upon the operator possessing correct magic to enable him to operate the instrument successfully.

If a man's *iwa* makes many mistakes he will realise that it has become "cold," and, being *zele*, has lost its magic. This may be due to the breaking of one of the food or sex taboos, or it may be due to the operation of the *iwa* too often with women looking on, but generally this "coldness" of the instrument is attributed to *mangu* (Black Magic or witchcraft), that malign influence by which all man's cultural ends and ambitions are likely to be thwarted. However, in this instance the injury can be remedied, the "coldness" removed, and the magic rehabilitated.

They take the *iwa* and place *ngwa iwa* (medicine of *iwa*) between the lid and the table-surface, and they bind it round with barkcloth. They dig a hole in the path along which people are often passing, or better still at the cross-paths, and place the *iwa* in the hole and cover it up with earth and smooth down the place so that no one will see that a hole has been dug there. Before covering the *iwa* they address it, saying "You are *iwa*; why do you lie? tell the truth." The many persons who pass unwittingly over the instrument remove the "coldness." If a man is aware that the *iwa* lies buried he will go round the spot and not over it, since he does not wish to take part of the "coldness" on himself.

After two days the owner will dig up his *iwa*, and having burnt some *benge* in the fire, he rubs the soot of it on the *iwa*, so that it may tell the truth just as *benge* tells it, and he addresses to the instrument the *sima* or spell, thus:—

"*iwa mu gumba lengo na benge.*"

"*iwa* you speak truth with *benge.*"

He then puts some fresh *benge* on the table-surface, binds it up with barkcloth, and places it under the verandah of his hut for five days. After this the magical instrument may be expected to work properly and to tell the future or past correctly.

I believe that this method of burying the *iwa* is also used sometimes, either alternately or complementary to—I am uncertain which—observation of the food and sex taboos whilst carving out the instrument with an adze and drying it in the sun.

MAGIC OF WORKING THE ORACLE.

A man cannot expect the *iwa* to tell the truth unless he has himself received the proper magic to operate it. For, unlike *benge* and *dakpa*, a man must first have acquired the magic to operate the oracle successfully. Here, again, it may well be pointed out that the oracles do not in themselves possess the virtue of telling hidden matters, but that *iwa* only acquires such virtue through the observance of the full ritual restrictions, through adherence to the traditional usage, and through the possession by its operator of the right magic.

A man who wishes to operate the *iwa* will therefore first buy the magic from some man who possesses it, probably from a *binza*, or professional magician. The owner of the medicine will place some of it in a small pot and bring it to the boil, in oil, over a fire. Whilst it is boiling he will utter the spell. He repeats over and over again the name of the man who wishes to buy the magic, and makes movements over the pot with the thumb and forefinger of his right hand as though he were operating the instrument *iwa*. He addresses the magic in the pot with much repetition and variation on the following theme:—

<i>ngwa</i>	<i>nga</i>	<i>mo</i>	<i>ngwa</i>	<i>iwa</i>	<i>nga</i>	<i>mo</i>	<i>mo</i>	<i>gumba</i>
magic	are	you	magic	<i>iwa</i>	are	you	you	speak
<i>lengo</i>	<i>a</i>	<i>gumba</i>	(<i>limo</i>	<i>ho</i>	<i>nga</i>	<i>liwe</i>) ¹	<i>liwe</i>	<i>mu</i>
truth	speak	name	its	is	<i>liwe</i>	<i>liwe</i>	you	
<i>gumba</i>	<i>lengo</i>	<i>a</i>	<i>gumba</i>	<i>banzua</i>	<i>mu</i>	<i>gumba</i>	<i>lengo</i>	
speak	truth		speak	<i>banzua</i>	you	speak	truth	
<i>a</i>	<i>gumba</i>	<i>mu</i>	<i>gumba</i>	<i>unzunzu</i> .	<i>kara</i>	<i>kara</i>	<i>mu</i>	
speak	you	speak	correctly.	it	boils.		you	
<i>gumba</i>	<i>unzunzu</i>	<i>mu</i>	<i>gumba</i>	<i>lengo</i>	<i>a</i>	<i>gumba</i>		
speak	correctly	you	speak	truth		speak		

The recipient of the magic now pays a half-piastre or a piastre or a small ring or a small knife, which is dropped into the pot.² Without this payment the operations cannot be continued, as the pot will break and the magic will be lost. The purchaser then begins to stir and to utter the spell over the magic in a similar manner. As in all such magic amongst

¹ An explanatory interpolation by my informant. *Liwe* and *banzua* are two of the medicines in the pot.

² It is a very common feature of Zande magic that the payment is part of the traditional procedure, having its set place in the sequence of the ceremony.

the Azande the stirring of the magic (*i na woraha*) in oil is a very important part of the proceedings, and when magic is being paid for the payment precedes the privilege of being allowed to stir the magic and utter the spell.

When it has boiled for some time the unabsorbed oil on top is poured off into a gourd or leaf-cup and the solid part of the mixture remains in the pot. The owner of the magic now takes the oil which has been drawn off and rubs the purchaser's hands with it, and also his own hands and the hands of any other person present who has in the past received the medicine. They all drink some of the oil from a little leaf-cup, and finally he rubs the *iwa* with the oil.

If he is a *binza* or professional magician, the owner of the magic will possess a horn of waterbuck or hartebeeste, or of some other large animal of the bush, which is filled with a black paste composed of roots of plants and oil. He takes a long spoon-stick into the black medicine, and drawing some of it out, mixes it with the magical substance in the pot and then eats some of it himself and gives some to the purchaser to be eaten from the spoon drawn across his mouth.

The main part of the ceremony now commences. The owner of the magic takes his knife from its sheath and makes incisions with the point on the right hand and right foot, near the big toe, of the purchaser, for these parts of the body come into contact with the *iwa*. He makes incisions in his left foot, since he may meet with evil influences on the path before operating the instrument. Into these incisions he rubs a little of the medicine from the pot, as also into the table of the *iwa*. He himself will also take the opportunity of making fresh incisions in his own hand, and so also will any persons who have been through the ceremony in the past and who wish to take the opportunity to absorb fresh magic. They then eat the remainder of the magical substance.¹

(5) (b) ANALYSIS OF THE MAGIC.

An analysis of the *iwa* oracle-magic shows us a similar structure to those of *benge* and *dakpa*.

- (1) TABOO.—The food and sex taboos must be observed during the making of the instrument and prior to its use. A breach

¹ The purchaser only receives magic of the *iwa*. He is not taught the composition of the medicine, for which he would have to make a large payment.

of these taboos will destroy the power of the magic, which can then be resuscitated only by a new and complete magical process.

- (2) TRADITIONAL PROCEDURE.—The traditional technique and order in working the oracle must be upheld. The correct medicine must first be given to the *iwa*, it must be addressed in the stereotyped phraseology of the oracle; the traditional interpretations must be adhered to.
- (3) SOCIAL CONTEXT.—The social setting in which the consulting of the augury *iwa* plays its part as a preliminary to certain social acts. This is to be discussed presently.
- (4) The operator must have taken the proper magic to enable him to manipulate the oracle.

Iwa is not itself an owned magic. On the contrary, the taboos, the traditional procedure, the *sima*, many of the medicines for placing on the oracle table, are known to all. But the medicine of the operator is known only to a limited number of men, and its use must be bought by a small payment. Once more there is an actual sex division in the use of the magic, women being acquainted with it but not using it.¹

6. (a) DESCRIPTIVE ACCOUNT OF THE MAPINGO ORACLE.

There are as many means of telling hidden affairs in which man is the agent, such as the medicine-men and men in whom the spirits of the dead dwell, as there are means in which some external agent is the oracle-giver, but they are outside the scope of the paper.

There are also several machine-oracles little used amongst the Azande such as the *makama* and the *doma* fruit, the former being part of the equipment of the *binza* or medicine-man, which we will not describe here. Also we shall here pass over the oracles which are in use amongst the Azande who border on foreign lands, such as those employed by the Baka, Moro, Bellanda and other tribes.

The only other oracle which we shall describe in this paper is the *mapingo*. The *mapingo* is so simple that it is widely used, either to enquire into small matters or more especially as a preliminary to one of the greater oracles. Women use the oracle much and even children make it to enquire into their little affairs. Lagae says "Les Azande ne

¹ One woman in Ngere's country is said to use it. See page 23.

pratique pas le *mapingo*, très en honneur chez les Mangbetu et les Abarambo," but it is in common usage amongst the Azande of the Bahr-el-Ghazal.

All the machinery needed are three little pieces of wood, about half an inch long and with rounded sides, from the *bilikpa* tree (the oracle is sometimes called *bilikpa*) or the *badangi* tree, or the magical tree *doma*, or the magical tree *zelengbonde*, or the homely vegetable *gbanda*. If there is only one question to be asked, three small pieces of wood are sufficient, but if there are two problems, then six pieces will be required, and so on. But one of these trees always grows near the homestead and no trouble is expended in providing the material of the oracle. The consulter takes the little pieces of wood and places them, two, side by side, as a base, and the third piece resting on the other two. He then addresses it

<i>bilikpa</i>	<i>nga</i>	<i>mu</i>	<i>du le.</i>	<i>mi</i>	<i>akpi</i>	<i>gi</i>
<i>bilikpa</i>	are	you	here	I	will die	this
<i>gana</i>	<i>si</i>	(a) <i>gbata ka</i>	<i>mi</i>	<i>akpinga le</i>	<i>si</i>	
year	it	will scatter	I	will not die	it	
<i>ra</i>	<i>uru</i>	<i>za</i>				
remains	sun	in position.				

The oracle is consulted in the evening just before nightfall, and the little wooden piles, in number according to the number of questions asked, remain in a clearing at the edge of the hut-space bordering the garden, till morning comes. If during the night something has scattered the pieces of wood so that the little piled-up structure has fallen, then, if addressed as above, the answer is "You will die this year." But if the night has passed without the little sticks having fallen from their previously arranged position, then the answer is "You will not die this year."

6. (b) ANALYSIS OF THE MAGIC.

As the oracle conforms in its structural characteristics to the characteristic form of *benge*, *dakpa* and *iwa*, we may condense the analysis.

- (1) TABOO.—*Mapingo* must be carried out under the observance of sex and food taboos.
- (2) TRADITIONAL PROCEDURE.—It must be made with the usual woods proper to the oracle and must be carried out in the

stereotyped manner and time with *sima* and method of interpretation.

(3) SOCIAL CONTEXT.—It has its social milieu (*see* pp. 37 ff).

It is like *benge* and the other oracles in that it is "unowned magic." It is known to all. No expenses are involved and there is no sex bar to use.

7. GENERAL ANALYSIS OF ORACLE-MAGIC.

We have described four methods by which the Azande discover matters hidden to man. We have tried to show what the Zande thinks and does in the many peculiar occasions which arise from the natural workings of the oracle. We have tried to estimate his trust in the various forms of oracle and to show how the plasticity of the rites maintains his confidence in, and upholds the social utility of, the magic.

We have seen that none of these oracles have magical powers in themselves, neither the scraped and dried roots of the *benge*, nor the wooden instrument *iwa*, nor termites, nor the three sticks of the *mapingo*, but that they exercise their magical powers only as a result of man's abstinence and knowledge of tradition.

We have remarked that the oracle-magic is not owned magic, but that knowledge of *benge*, *dakpa*, *iwa* and *mapingo* is known to all or can be learnt without payment. All adult Azande know what taboos they must keep, and how to manipulate, address and interpret the oracles. In *iwa* alone is there a slightly different connotation, for in *iwa* there is a special magic in which lies success in using the oracle, and that can only be acquired by purchase. But this is a quite separate magic from that of the oracle itself.

We have noticed that the morphological structure of all these oracle magics is the same, that they all depend for their virtue upon knowledge of the correct implements, upon their being carried out under taboos, and in the traditional sequence and manner of use, upon the *sima* or address being uttered to the magic in stereotyped phraseology and form, but not in fixed formulæ, and upon the findings of the oracle being interpreted in accordance with a definite set of rules.

We shall now see that the occasions of the consultation of the oracles are a social setting wherein the oracle has its special ceremonial place in the oracle of economic, legal, religious and social acts of everyday

life. We shall do this by first giving as briefly as possible two descriptive examples of the way in which one finds the oracles functioning in their social contexts and then by giving a condensed analysis showing the large range of economic and ceremonial acts with which the oracle-magic is associated and in which it plays its rôle.

8. SOCIAL FUNCTIONS OF ORACLE-MAGIC.

(a) DESCRIPTIVE ACCOUNT OF FUNCTION.

I give the matrimonial history of Kamunga to show how *benge* plays its rôle in the social context of marriage, but I must point out that he was in my service and, consequently, far wealthier than the ordinary Zande who has not the means of becoming such a Don Juan.

Kamunga is about sixteen years of age. When I met him first he had been married for about two years to a girl, called *Nabani*. *Benge* had in the *bambata sima* agreed to the marriage, and for some reason the *gingo* had been postponed. *Nabani* had only lived with Kamunga for a few months during these two years, because her brother (her father was dead) would not let her remain permanently with her husband, but had exacted many presents from him upon the promise that *Nabani* would shortly take up residence with him as a permanent union. In this way he had exacted from Kamunga clothes, a box, tin cooking vessels and other articles of trade. When Kamunga became impatient and asked his wife's brother why his wife had not come to join him, he replied that he had consulted *benge* in the belated *gingo*, and that it had said that *Nabani* would die if she went to live at Kamunga's home at Yambio.

Kamunga now entered my service and changed his residence and demanded his wife. Her brother said that he had twice consulted *benge* with reference to new addresses, and still *benge* said that his sister would die.

Whilst affairs were in this impasse Kamunga decided to take another wife, *Nalihe*, daughter of *Bambina*, in the district of *Bagomoro* (Place of Hunger), where we were then living. The consultation of *benge* with regard to this marriage has been referred to already in this Paper.

- (1) *Benge* spared the first fowl, and the second fowl was also spared in the oracle but died later in Kamunga's home. The verdict was, therefore, considered as invalid (see p. 18).

- (2) *Benge* was again consulted and killed the first fowl and spared the second fowl, thus consenting to the marriage. But the belated death of the fowl in the first oracle made Kamunga nervous, and he decided to ask *benge* again (see pp. 18 and 19).

Such was the position when Kamunga and I went to stay in the neighbourhood of the homestead of Nabani, his first wife. Nabani's brother tried to extract more gifts from Kamunga, which he would have given had I not, unwisely, as an anthropologist, forbidden him to do so. I suggested he should consult *benge* again, but he said that this was quite useless, as *benge* was quite clear in its verdict against the marriage. Kamunga said that he would himself consult *benge*, and the brother of his wife agreed to let his sister live with her husband for a few days. At the same time the brother of Nalihe, his second wife, came to see him, so that he had the opportunity of consulting *benge* about both marriages.

- (1) *Benge*, by sparing the first fowl and killing the second fowl, once again reiterated its refusal to the marriage. Kamunga was very upset, but as Nabani was unwell at the time he feared that she might die whilst living with him, and next morning he sent her home for good and demanded the return of his twenty spears.
- (2) *Benge* agreed to his marriage with Nalihe, his second wife, by killing the first fowl and sparing the second fowl. The marriage to Nalihe was thereupon confirmed and settled. Kamunga was thus left with one wife, and about three weeks later he decided to take in marriage another girl whose name I forget, but whom we will call No. 3.
- (1) *Benge*, on being consulted, spared both hens, and its verdict was invalid. A taboo had been broken and *benge* was *zele* (cold).
- (2) On another day, *benge* was again asked, and killed the first hen and spared the second hen, thus consenting to the marriage. Kamunga paid eight spears to the girl's father and became affianced to the girl.

Wife No. 1, Nabani, has returned to live with her brother, and Kamunga is trying to regain his other thirteen spears. Wife No. II, Nalihe, is now living happily with Kamunga. Wife No. III had not, on my departure from the country, yet come to live with her husband.

Before we go on to describe a second example of the social rôle of the oracle, there are a few points in the above account which require elucidation. Firstly, we see how *benge* acts as a legal force in giving validity to the bond of marriage. I have heard discussion on marriage in which the parents have been trying to regain their daughter—not all the spears having been paid—but in which the husband points out the fact that *benge* has definitely consented to the marriage as his strongest argument for his retention of the girl. *Benge* acts as a binding force to the social contract of marriage. Conversely, as in the case of Kamunga's first wife, where the oracle has not been completed, the girl's guardian is able to keep her at home and exact presents from her husband. I may add that there is no ceremonial of marriage amongst the Azande.

Secondly, we see another means by which the oracle allows the native to elude its findings without breaking any traditional rule. He may take the girl to his home upon the verdict of the *bambata sima* and indefinitely postpone the *gingo*. Also in the *sima* they will always mention the place of the husband's home, so that if the *benge* declares against the marriage, they can consult it again on the grounds that change of residence alters the circumstances which were mentioned in the original *sima*.

Thirdly, it appears that the Zande is not above saying that he has consulted the oracle and has a verdict for or against the marriage, when he has never asked *benge* at all. It is therefore thought better either for both parties to consult the oracle or for a representative of one party to watch the oracle of the other party.

In the case just considered we have described the function of *benge* in the most important of human social bonds, those of marriage. This is a clear matter-of-fact reality. In the second example which we shall give we shall describe the function of *benge* in a case outside actuality, but in the realms of emotional life.

I was staying in the homestead of a blind and aged man, named Gami, an important chief's deputy. During one of the public dances and séances given by the medicine men of the district, one of the medicine men said that he saw by his magic that Gami would die this year, and that his death would be due to his wives, who wanted to be rid of him. News of this declaration was brought in the evening to the old man, who at once consulted *iwa* as to which wife was trying to kill him by *mangu* (witchcraft).

This is as far as I followed the affair, but as it was known to the natives I had no difficulty in receiving an account as to what would happen in the future. Gami will consult *dakpa* and *benge* to check *iwa*'s accusation of his wife.

If *dakpa*, and later, *benge* support *iwa*, then he will consult *iwa* as to who shall inform his wife. He will also ask *benge* whether his wife stands alone in this matter, or whether there is someone behind her. If she stands alone, he will enquire whether he will live if his wife blows water (the Zande method of counteracting witchcraft).

We suppose that *benge* says "yes" to these questions, that his wife stands alone, and that he will live if she blows water. The friend, an elderly man, chosen by *iwa*, now goes with the *sve kondo* (chicken's wing)¹ on the end of a stick, and places it on the ground in front of her. He tells her that *benge* says that she is injuring her husband and that she must show her goodwill by blowing out water from her mouth on to the wing of the fowl. As she does this, she says: "If indeed there is *mangu* (witchcraft) in me, then may it be cooled." When she has blown the water on to the wing of the fowl, she tells the messenger to go back to her husband and say to him that he must consult the oracles again.

If after some days *benge* tells him that his wife is still injuring him with *mango*, the process is repeated. This may happen two or three times, and the woman will feel so miserable that she will go to a distant *bakumba*, or chief's deputy, and ask him to make an *gbo benge* or special test with the *benge*.

The *bakumba* will tell her to go home and after a few days he will either send to Gami to tell him that *benge* spared the fowl and that his wife is no longer acting against him, or he will send the wing of the fowl to the woman, showing that *benge* has killed the fowl and affirmed her guilt. In the former case the husband Gami will have to pay five spears to the *bakumba* for making the test, in the latter case the burden of payment will fall on the wife's relations.

We need not go into other aspects of this case than the use of the oracles. I have said that the story was outside the realm of actualities

¹ When any *benge* is finished, the consultant places one wing of the dead bird on the end of a stick. The feathers of the wing are spread out like a fan. He always takes this to his hut and, in the case of ordinary questions, it remains stuck between the grasses in the roof of his hut. In cases of witchcraft it is always sent to the witch to be dealt with as here described. In cases where the consultant of the oracle is not present at the oracle, the wing is sent to him to inform him of the verdict, as in the text on page 8.

and in the world of emotion. Old age, blindness, sexual impotence, and the youth of women are indeed facts from which spring the fear of death, jealousy of wives, suspicions of sons and neighbours, all the emotional setting in which our story is woven.

In the case of Kamunga we saw how *benge* acted as a binding force in the social contract of marriage. In the case of Gami we see also how *benge* acts as a legal force regulating the means by which an old man renews his hope and conquers his fear. *Benge* gives authority to each step he takes, decides who is the witch, whether she is alone, who shall go to her, will he die if she blows water, and makes the dangerous accusation of witchcraft into a socially controlled procedure at which no one can cavil. We see also how it calms the emotional unrest of man. Nothing is more restless, helpless and dangerous than a man racked with fear, doubt and hesitation, bound to engage himself in some activity to settle his fears but not knowing what form of activity will disperse them. But *benge* dictates to him his course of action along traditional and socially harmless lines and *benge* gives him an object upon which his emotional unrest can spend itself.

We shall shortly return to this point, when we will discuss the social function of oracle-magic, but first we must describe one aspect of *benge* which we have barely mentioned.

(b) BENGE AS LEGAL MACHINERY.

We have left the legal functions of *benge* till the end of our paper in order that the account may run consecutively with the other social functions of the oracles and because the *benge* oracle in cases of law presents certain peculiarities. We shall begin by giving a descriptive account of *benge* in its rôle of law, in the narrow sense in which we use the term in Europe, before we discuss its rôle of law in the wide sense of binding sanctions.

We have already pointed out that only a chief can make an official oracle in cases of civil and criminal dispute. Any Zande can, indeed, consult as many oracles as he pleases but he may not act against another man on their findings. His chief must first make an official test with the *benge*.

All that we mean by Courts of law, charges, counsel for prosecution and for defence, juries and verdicts are for a Zande summed up in the procedure of *benge*. The chief does not hear the case, he does not call

witnesses, he does not balance evidence nor pronounce the verdict. All these processes he leaves to *benge*.

We will describe what happens in one of the most serious and one of the most frequent civil actions in Zande society, the action against witchcraft. Now, to the Zande, disease, wounds, death are due not to natural causes but to the malign activities of "witchcraft" or to the power of "medicine." If a man dies he has been killed either by *mangu* (witchcraft) or by *ngwa* (magic). The oracles are consulted and *benge* will say that the dead man was a victim of *mangu*, whereupon his relatives prepare to avenge his death. But the highly complex and organised Zande society allow no one to take vengeance on his own initiative or on the initiative of his social group, but vengeance is directed along prescribed channels. For the relatives of the dead cannot act on their own *benge* verdict but will inform their chief, who makes an official test of the case with *benge*. If *benge* kills the first fowl and spares the second fowl then the *puta benge* will send his chief the wing as a sign of guilt and the chief will authorise the injured relatives to take revenge or accept compensation. The verdict of the oracle is checked eventually by the opening up of the stomach of the man and within *mangu* (witchcraft) will be discovered, either after the man has been killed in revenge, or in the event of compensation being accepted, then at his natural death.¹

I will give one more example for purposes of subsequent analysis. "A" says that "B" has committed adultery with his wife, and "B" denies the charge. "A" goes to the chief and upon "B" reiterating his denial, *benge* is left to decide which of the two is speaking the truth and which the lie. The loser will have to pay the expenses of the oracle, being a fee of 10 spears or even 15 spears to his chief.

I do not wish to discuss features of these cases which do not concern our subject of oracles.

Sometimes in the past a man or woman would drink the *benge* himself or herself instead of the fowls. My notes on this ceremony are incomplete, and I shall, on my return to Africa, obtain a first-hand account from a very intelligent native who himself underwent the ordeal. Meanwhile I shall rely very largely upon Lagae, his contributions to our

¹ Of course to-day the white man allows no killing in revenge nor payment of compensation. I have never seen a stomach opened to discover *mangu*, but it is still frequently done in secret.

account being easily marked by the tongue in which they were written. Says Lagae: "L'épreuve du *benge* se fait parfois directement sur un homme ou une femme, soit parce qu'ils contestent la réponse d'un augure véridique qui a proclamé leur culpabilité, soit, parce que le fait dont ils sont accusés est d'une gravité exceptionnelle. Cela dépend, en somme, de l'appréciation et de la sévérité du chef.

"Cette épreuve se fait comme suit. L'accusé s'assied à terre. On fait une préparation de *benge* plus dilué que s'il agirait d'une épreuve sur les poulets. Le *putabenge* prend une feuille, la replie pour en faire un godet, puise de jus de *benge*, environ cinquante centimètres cubes, sans y mêler la marc, et fait boire cette potion.

"Le *Sima benge* commence alors à interpellier le *benge*, en disant] *benge, benge*, qui est dans le ventre de cet homme, dévoile la vérité. Si cet homme est vraiment coupable, tuez le, qu'il tombe. Si c'est un mensonge, s'il n'est pas coupable qu'il survive, qu'il ne chancelle pas et] aille ramasser une à une les ailes de poule plantées à terre.

"Entretiens on a placé, à une distance de quelques mètres un nombre variable d'ailes de poule, ou même des bâtonnets. Selon la sévérité du chef, on en met un nombre que varie de dix à vingt, à une distance de quelques pas l'une de l'autre.

"L'accusé est tenu d'aller les ramasser. S'il chancelle et tombe au cours de cette opération, il est reconnu coupable. S'il réussit à ramasser le tout sans tomber, son innocence est claire et nette. Dans les deux cas, l'oracle est définitif.

"S'il tombe en proie à des conclusions, le chef a le droit de la faire achever sur place. Généralement il autorise les amis du coupable à l'emporter et à lui administrer un contre-poison, on utilise, à cet effet l'écorce du *koyo* pilée pour en dégager la victime. Le jus de l'écorce du *koyo* est, paraît-il, un vomitif. Si la victime parvient à rendre le *benge* assez rapidement, il a des chances d'échapper à la mort. On va également coucher la victime dans la vase, ayant soin de recouvrir tout le corps sauf la face. Ce procédé est jugé assez efficace par les indigènes. Néanmoins la mort est fréquente.

"Celui qui a résisté à l'épreuve du *benge* et n'a pas chancelé, conserve toute assurance. Sa palabre est bonne; le *benge* n'a pas voulu le tuer. Il s'en va toutefois se coucher au frais, près d'une rivière, dans

un endroit vaseux, et y reste jusque dans la soirée. On n'omet généralement pas de lui administrer une potion de jus de *kpyo*, en guise de vomitif."

I will supplement this account with notes from the ceremony amongst Azande of the Bahr-el-Ghazal. I was told that a person would drink *benge* only in grave issues, such as adultery with the wife of a chief or plotting against the life of a chief with black magic. They first unwind the coils of the man's hair and ruffle his hair so that it all stands up. They then place a log of wood on the ground. The man drinks the *benge*, the *Putu benge* rings a bell, and then utters the *Sima* or address to the magic in the stomach of the man. They then throw the bell to a distance, and whilst they beat on the wood the man ran to pick up and return with the bell. His failure or success in doing this proved his guilt or innocence. If the man returned with the bell and later died there was apparently no redress, but my informants would not readily admit that such an event ever occurred. I was told that if the man was proved guilty he was usually hacked to pieces there and then by the chief's deputies, since the crime was a grave one. But I must add that I never found it of much value to enquire into past events, which it is impossible to observe to-day, since the native has only a limited interest in them.

There is a magic, *zelengbondo benge*, which can be used to influence *benge*. All my informants agreed that it is never used except in legal disputes or criminal actions. The magic is cooked in oil, and as the magician stirs it he says the spell :—

<i>zelengbondo</i>	<i>benge</i>	<i>nga mo i</i>	<i>sima</i>	<i>kondo</i>
magic	(of) <i>benge</i>	are you they	address	fowl
<i>tipa re pati</i>	<i>benge</i>	<i>yo i di gi</i>	<i>kondo</i>	
about me near	<i>benge</i>	in they take this	fowl	
<i>ti li mo li i di</i>	<i>ru u kura</i>	<i>a kura</i>		
in name my they	take you (<i>benge</i>)	it survives		
<i>ni wene sale</i>	<i>i di gingo u ima</i>	<i>a ima</i>		
with good for me	they take gingo it dies	dies		
<i>ni wene sale</i>				
with good for me				

The magic is known to few, and is regarded by the Zande as Black Magic. Though it is powerful, I was told that it would not help a man in a case where he had, himself, to drink the *benge*, and my informant quoted the case of a *bakumba* who had sexual intercourse with one of the wives of the great chief Gbudwe (d. 1905). This man was known to possess the magic *zelengbondo benge*, but he died in the ordeal nevertheless.

Also there is always a danger of being discovered in using the magic where the oracle is giving its answers through fowls. The hen will show peculiar distress, and will keep on falling as though dead and then getting up again. Such behaviour may lead the *puta benge* to suspect that the magic *zelengbondo benge* was used by the accused to influence the *benge*. He will at once put the question to *benge* whether the accused has used this magic. If *benge* kills the fowl immediately, thus giving an affirmative reply, then the *puta benge* will inform the chief. I was told that death was the invariable punishment for tampering in this manner with the machinery of justice.

There are two points in this description to which attention must be drawn. Firstly, we must note the position of the chiefs in the *benge* context. Chieftainship amongst the Azande is very pronounced and, in consequence, we might expect to find, as we do, that the mould of society leaves its form on the institution of the *benge* oracle. Lagae says that in the past, so the Azande told him, *benge* was known only to the Avongara chiefs, and he commendably quotes his information :—

<i>gu</i>	<i>pay</i>	<i>nga</i>	<i>pa</i>	<i>benge</i>	<i>si</i>	<i>aenge</i>	<i>ti</i>
that	affair	is	affair	<i>benge</i>	it	originated	from
<i>ki na</i>	<i>agbiya</i>		<i>kungbwe</i>		<i>Azande</i>	<i>gbwa</i>	
only	chiefs		ordinary		Azande	just	
<i>i</i>	<i>ahinanga</i>		<i>pa</i>	<i>benge</i>	<i>mbata</i>	<i>te</i>	
they	did not know		affair	<i>benge</i>	before.		

This statement is probably incorrect. It is denied by all my informants, and Lagae himself adds "peut-on prendre cela a la lettre?" However this may be, the chiefs have a leadership in the *benge* magic. Only they can make an official test by the oracle, and for this they are paid ten spears, or sometimes fifteen spears.¹ The Zande chiefs, like

¹ To give some idea as to the value which this sum represents I will add that 20 spears is the normal number handed over in marriage in compensation to the parent of his bride.

other aristocratic possessors of the legal machinery, find "justitia est magnum emolumentum." On other occasions, such as in war or in public religious ceremonies, the chiefs consult the oracle officially. Moreover, the chiefs possess the actual material of the magic in far greater quantities than commoners, or even than chief's deputies. We have seen that either the chief organised the *benge* expedition into the Congo, or he was a part shareholder in the undertaking. There is no doubt that the special association of *benge* with chieftainship greatly enhanced the power of the Avongara.

The second point to which we shall draw attention arises from the white man's attitude towards the oracles. I have sometimes heard white men say, "but there is no justice in the *benge* method." We need not here enter into the ethics of justice, but one can re-state this criticism in another and more scientific form. What is the social utility of *benge* as legal machinery? It is true that the judgments of *benge* are always accepted as final, but if the evildoer and the righteous man stand an equal chance of civil and criminal conviction, however satisfactory in other respects the legal machinery of *benge* may be, it would hardly be socially useful, but the reverse. The answer to this difficulty is to recall a phrase already quoted, and which I have so often heard on Zande lips:—

<i>benge</i>	<i>na</i>	<i>gumbanga</i>	<i>zile te,</i>	<i>ga ani waraga</i>	<i>do.</i>
<i>benge</i>	does	not speak	error	of us	paper is

In our own society the guilty man can make a reasoned calculation that he always has a chance of escaping conviction, whereas no Zande would admit that the guilty had a chance of eluding conviction unless they possessed the magic of influencing the oracle. They will tell you, if you press the question, that a man who is clearly guilty is not such a fool as to allow the case to go to *benge*, as he will then have to pay, not only compensation to the party he has injured, but also the heavy court fees to the chief.

But we cannot dispose of the problem quite so easily because, if the Zande criminal knew that he had no chance of hiding his guilt, there would appear to be no reason for legal cases, whereas these are frequent. We must remember, however, that probably by far the greater number of cases concern black magic. Now, in these cases the accused naturally believes himself to be innocent, as witchcraft is probably never practised at all, and he is willing to make the *benge* test. What are the feelings of

an innocent man when *benge* denounces him it is difficult to say. If you ask him he will probably say, "If there is witchcraft, let it be cooled. I have no ill will. See I blow water. It is finished." I do not think the native is sceptical of the findings of *benge*; indeed, all the evidence goes to show that he is not. Men and women have been eager, not reluctant, to drink the magic themselves to show that they are not witches, or to cut open the stomachs of their beloved dead ones to prove that the family are not a family of witches, for witchcraft is hereditary.

The fewer number of cases concern such actions as adultery. Here the accused can have no doubt as to his own innocence or guilt. But if guilty and he agrees to the *benge* test, it must not be supposed that he is in any way sceptical about the oracle, for to think this would be to imagine that man's actions are based solely upon reason, which we all know by introspection and observation is not so. He emotionally rebels against submitting to punishment or death without a struggle and it is to this emotional reaction, and not to a reasoned scepticism, that we must attribute the contradiction between his beliefs and his behaviour.¹

LEGAL FUNCTIONS OF ORACLE-MAGIC.

We have already given consideration to the manner in which the oracles act not only to tell hidden matters and to give to man confidence in his undertakings but also to direct his activities into ordered social channels and to give sanction to activities which are binding on himself and others. We have shown in the case of Kamunga how the consultation of the oracle acts as a stabilising force on the bonds of marriage (see page 41). We have shown in the case of Gami how emotional unrest finds its outlet not in activity disruptive to society, but in a manner sanctioned by the social institution of the oracles. Indeed, in whatever instance we find the oracles at work we shall find that they not only act as passive informants but that they are active agents amongst the binding social sanctions which compose Zande law. I will give one more example of the manner in which the sanctions work and will then leave this aspect

¹ I have already pointed out in this Paper that we shall often find a mixture of rational opinion in conjunction with irrational beliefs, and I call attention again to another example here. I once asked a man, named Bagbiyo, a man considered by everyone as a witch, whether he was one or not. He indignantly denied the impeachment, and when I asked him how it was that his neighbours were always sending him the wings of the fowls killed by *benge*, in affirmative answer to the question "Is Bagbiyo using witchcraft against me?" he replied that the reason for this was that they always asked *benge* about him and not about other people.

because it requires discussion in connection with the entire range of Zande magic, which we do not attempt to describe in this paper. I have explained how the relations of a dead man act (page 45). They perpetrate what in another context is a heinous crime, killing a human being by magic. But in the context of death this is a pious and laudable action which they are compelled by social usage to undertake. If you ask a Zande whether the relatives of the man who is slain by magic will not take a similar line, he will reply that they can do nothing because *benge* had told the avenger that their relative was a witch and that the avengers could have acted in no other way than the way in which they did act. In this manner the oracle gives sanction to social acts.

SOCIAL CONTEXTS OF ORACLE-MAGIC.

This we regard as the most important aspect of our subject, but it is also the most difficult and the one in which we feel the least satisfaction in having attempted to elucidate. As the magic is practised in secret it is always difficult to find out which type of oracle would be used in any particular social context and its exact place in the sequence of events which form the contexts. We know, nevertheless, that oracle-magic forms the prologue to all the more important social, economic, legal and religious acts of a native's life. Without the oracle no economic work of magnitude can be started; no crisis in man's biological and social existence is unaccompanied by one or more forms of divination; no big religious ceremony would be held without first consulting the oracles; the oracle-magic forms the whole machinery of justice.

But since these oracles have their order and sequence in the complicated social structure of the Azande, so they should be described in relation to the activities in which they play their rôle. It is only in their full context in actual life that this function can be clearly demonstrated. But it is important to bring all these social occasions together into a condensed analysis to focus sharply the part which the magic plays in everyday life.

In the crisis of biological development, the "rites de passage" of life, one of the major oracles is always consulted. Before the birth of a child, both father and mother will consult *benge* and *dakpa* as to the dangers of delivery to mother and babe. Before the father takes the

step of giving a name to his infant, he will ask *benge* to assure him that it will live. Before the cutting of the foreskin in the circumcision ceremonies, sometimes a mortal operation, the boy's circumcision tutor, and, I believe, the father and the operator also, will consult *benge* whether the boy will survive the cutting. No man will ever enter upon the contract of marriage, nor will any girl's parents allow her to live with her husband, without first having consent from *benge*. No man will enter the secret society of *bili* without *benge*'s assurance that he will pass safely through the rites of initiation. When sickness and pain threaten a Zande he will at first have recourse to *iwa*, *dakpa* and *benge* to discover who is injuring him with Black Magic, so that he may be cured and healed. When the cloud of death is hanging over him he will ask the oracle whether he will die. When a man has died his grief-stricken relatives will rely upon *benge* to tell them how he has died, so that they may be avenged, and later to assure them that vengeance has been made.

In the important economic undertaking of building a new homestead, a man will probably consult *mapingo*, *dakpa* and *benge* before he decides on a site. He will always consult the oracles before planting his main crop of *Telebun*, upon which he relies for his daily gruel and his beer, and often it will be necessary to find out by the same means who is responsible for the failure of any of his domesticated plants, so that he can arrange for the evil influence to be withdrawn. The Zande will ask *iwa* where he is to make his *gbaria* or hunting-square, a task involving a great labour. Again, if his hunting is unsuccessful, he will have recourse to the oracles to know why.

In time of drought the chief will obtain advice of *benge* before he orders the solemn and communal ceremony of offering the first fruits upon the rocks to God.

In time of wars or migrations, the direction of advance, the day of fighting, the success of the venture, will all be foretold by the oracle-magic.

There are many other occasions of less moment upon which the oracles, particularly the lesser oracles, are consulted.

But the social contexts I have given, embodying as they do the main biological, social and economic activities of a Zande's life, sufficiently illustrate the function of oracle-magic in its social milieu.

In all the situations I have given the Zande must consult the oracles, not only to satisfy his own cravings, when doubt and hesitation shake his resolve and paralyse his actions, and, when his aims and ambitions are threatened by the dark cultural force of evil, black magic, which is for ever frustrating his designs, not only do the oracles give him assurance that he may proceed to his work and social ventures with confidence, but also they give him sanction or legal power to begin them.

For it is not only from choice, but from social compulsion, that he consults the oracles, and their dicta are for him binding social obligations.

A SHORT ACCOUNT OF MEIDOB.

By E. Lampen.

THE Meidob Mountains which in places reach heights of 6,000 feet, are isolated in the North west Corner of Darfur. The Jebel lies well inside the desert of Northern Darfur being a good day and a half's journey north of Madu, the nearest of the Berti wells to the South. To West and East one can travel four or five days over a rolling plain bare of all except tufted grass and low bushes, and across the sand-stone plateaus of Taiga and Haitan before finding permanent water supplies in Northern Dar Zaghawa or in Kababish country. To the north the plain extends waterless to Bir Natrun.

The nearest neighbours of the Meidob are the inoffensive and un-enterprising Berti tribe with whom they have little traffic. In fact the Meidob's contact with the outer world remains very limited, an occasional visit from Kababish herdsmen in the northern *gizu*, a visit from the Zayadia for the purchase of salt cake from Malha, the annual tribal drove to Omdurman to raise their taxes from the markets, and very occasionally a call from the Darfur Bir Natrun salt caravan for water on its return journey. The last, which perhaps in earlier days gave them almost their only contact with the outer world, has now no significance for them, since the Egyptian caravan no longer comes south of Bir Natrun. Melik Gami' has a curious old hollow iron sceptre which he says he bought from the Egyptian merchants. Perhaps one ought not to omit mention of the infrequent Goraan raids in which the Meidob have given as much as they took in punishment.

The hill is as isolated and desolate in appearance as it is in position. It is linked by a thin strung line of small hills to the more picturesque Tegabo Hills in the South West, and to the deserted Teiga plateau on the West, but on all sides the final approach to the hill is across the treeless, almost shrubless, plain. As one arrives at the outer wall of the hill it divides into a number of smaller hills lying at the foot of a main massif. After threading ones way through these smaller hills across lumps of lava or flat broken flags one arrives in nearly every place at a steep wall

of 100 — 300 feet high. The wall is intersected by stony gullies, some of which are well-bearing, or by black sandy wadis in one or two cases, and all paths to the roof of the mountain lead up one of these for a distance and then zigzag up the steep bank to the top.

Once on the main massif the ascent to the heights in the centre and north is almost continuous. The track crosses bare up-lands, boulder strewn and with a few stunted bushes and sharp featured hillocks, creeps along-side a gorge with a perpendicular wall 100 feet high, winds among the larger red stone peaks and precipitous crater hills, drops to a black sandy wadi which now runs between stone walls and now opens on a tiny bay with a village on it.

The whole hill forcibly reminds me of Doughty's description of the Kheybar plateau.

Villages and people in the centre of the hill are few and there is only one well there at the foot of a drop of some fifty feet in the stone floor of a gorge.

The other wells and springs are all, with the exception of Malha, in deep wadi gorges near the points where they debouch on to the plain, and the cattle, which go for the unusually long period of 3 days unwatered in summer to enable them to visit the distant plain pastures, show an amazing agility in scrambling down the dizzy broken paths to the wells.

Malha deserves a word by itself. It is a large crater, perhaps a mile across and 300 feet deep, the lip lying flush with the plain and is joined to the main massif on the South West by a low and very ragged lava field. The sides are precipitous. When I visited it first there was no path fit for any camel not locally bred. With much labour one path was cleared which can be generally used. The others are goat tracks not even used by the neat-herds.

At the foot of the walls are two clear springs, lower a ring of trees, then a bare stretch of ground with slightly salt wells, and a small salt pool in the centre. In the pool are always a number of stakes on which the salt cakes and which are then withdrawn. Tiny patches of reeds fringe the pool.

Malha crater bulks largely in the minds of the Shelkota section who inhabit the South West portion of Meidob. A huge *haraz* tree on the floor of the crater with square lava blocks standing around is their ancient

council ground. Another bare rock on the North West side of the crater is one of the sacred stones in the hill, and certainly was worshipped by the Meidob until very recently. They are naturally, as professing Mohammedans, unwilling to admit any surviving traces of such a practice, but I believe binding oaths are still made on stones. The Meidob record with considerable satisfaction that some Zayadia who struck the stone with whips in Ali Dinar's time suffered so severely from camel sickness that they were glad to propitiate the offended power with large sacrifices in the crater. The crater is naturally supposed to be haunted by spirits.

More alarming must have been an event which occurred in the time of Ali Dinar. As the Meidob were watering round the pool, which in those days extended up to the ring of trees below the side walls, the water with loud gurgles disappeared, all save a tiny puddle of mud in the centre. When the frightened herdsman came next day, the water was slowly coming back. The same thing had happened in the previous generation. Melik Gami' Kheir told me that he had heard as a young man that many generations ago fire had come out of the crater and destroyed many persons and cattle. Also that once a red bull came out of the lake and drank down all the water.

The tribe themselves are divided into four sections; Shelkota in the South West, Urti in the North, Turrti in the West and on the Northern slopes of the Tegabu Gebels the Wirdato, closely allied to the Shelkota.

The tribe seem to be agreed on the fact that they came from the river, some saying more definitely Dongola, in the past. Their story is that they occupied Gebels Meidob, Tegabu and Teiga. The latter though now deserted and waterless has grave mounds of the same type as are to be seen in Jebel Meidob but these, which are always clustered round the foot of the hill, the Meidob do not claim as those of their ancestors. From Teiga they migrated to Goraan and Bedayat country, and the Meidob claim a doubtful affinity with one of the Bedayat tribes.

The Royal line in Shelkota is of the third dynasty. The first dynasty comprised 19 Kings. There is a representative of this line still alive.¹ The story is that the *wakil* of the last king of this line bribed the reigning Fur Sultan to give him the throne.

¹ Ahmed Tilo of Kabonja.

This *wakil* founded the Tesetti line. The last king of the Tesetti line had a nephew who stole a *naga* from the Zayadia. By Meidob custom the succession to the throne is matrilinear, and this nephew was the heir. The king called on him to restore the *naga*. His nephew refused. Thereupon the king disinherited him in favour of his son, the first of the Aurungide line. The Tesetti family were however given the overlordship of their own section of the tribe and hold it until this day.¹ Melik Gami' Kheir told me they are to hold it in perpetuity and that he cannot dismiss this Omda.

We come to historical times with the accession of King Bagari, the seventh of the Aurungide line, who was contemporary with Sultans Hussein and Ibrahim and Zubeir Pasha. Until his reign the Shelkota kingdom passed peacefully from each king to his sister's son. In Bagari's reign a usurper Ainyumba Daifani held the throne for a year, but Sultan Hussein intervened and suppressed him.

Bagari in his old age died and Ahmed Aingeru succeeded. Bagari's name is still held in respect in Jebel Meidob. His successor was an honest but weak monarch. Unfortunately he found himself faced with a situation in which these qualities were of little avail. The Mahdi had just begun and Ahmed Aingeru went to El Obeid to greet the Mahdi. His mission was not in response to any movement among his tribe who even today are only nominally Mohammedans. If he hoped to find support for an insecure throne he mistimed his venture, for he returned to find that Tukrasi of the male line had raided the Zayadia, seized 1,000 camels and defied Sultan Yusif when ordered to restore them. This exploit, so congenial to all Meidobis, encouraged Tukrasi to seize the throne. Whether Gami' Kheir, the heir to the throne, had started this feud by taking Tukrasi's wife is not established, but the old king speaks with a bitterness of Tukrasi which suggests that he may have wronged the latter, or perhaps only reflects his feelings of 40 years ago when he found Tukrasi accepted as a popular hero by most of his tribe and he himself confined to the stony wadi of Shekaka.

Ahmed Aingeru at this stage retired from a struggle in which he had no heart, and Gami' succeeded to the name of king and to a tiny corner of his territory.

¹ Gabir Zariaba, present Omda of Dar Kirra.

Meanwhile new powers had succeeded the fleeting figures of the later Fur Sultans in Fasher, and Gami' Kheir appealed to Osman Gano. Osman Gano solved Gami's immediate problem by executing Tukrasi, but Gami' had invoked the interest of an ally of whom he would gladly have been quit in later years.

The Shelkota section had been weakened by these internal disputes. They seem to have held from earlier times a predominance over the still wilder kingdom of the Urti Mountains in the North, but now the Urti king Ali Eisa established a supremacy, and called himself king of the Jebel. Such titles were apt to involve inconveniences in the Mahdia and Ali Eisa found himself called to Osman Gano's Court at Fasher. Gami' Kheir took advantage of his absence to lay the foundations of the position he now holds.

Osman Gano soon ordered the Meidob to form part of the great army of Darfur tribes which was being sent to the East. Gami' Kheir and many of his tribe paraded in Fasher, and were taken in bonds as far as Ergud, where the waterless desert between there and Gebel Meidob was supposed to have effectively cut off their retreat and they were released. The whole party however broke away across country leaving those who fell behind to die by thirst.

This experience did not encourage the Meidob to have further dealings with the Mahdists, and they awaited events in their hills. The Ta'aisha leaders sent the Berti with their Jehadia to punish the disobedient hillmen. The Meidob however drove the unwarlike Berti back through the Tagabu Hills, and one may still see the huge rocks with which they blocked the precious rock wells. A reinforcement of Jehadia sent by Mahmud Ahmed however drove back the Meidob and gradually the ring of watering places all round the hills was occupied. Finally the only permanent water in the heart of the Jebel at Aitcho was also seized and guarded. The Meidob lived precariously on water they stole from the wells at night until the rains, when their melon crop saved them. After this however Melik Gami' Kheir took the opportunity of Mahmud's departure to Jebel Nuba to make peace with Abdel Gadir Dalil. He had to hand back more than 100 rifles captured, but by his resistance he had virtually established himself as paramount king in the Gebel over Melik Fertisha (still alive) of the Urti and Melik Adam Kosongo (died 1925) of the Turrti.

Mahmud returned about 1892 to Fasher and insisted on Melik Gami' and the Meidob accompanying him to Omdurman. Ali Eisa accompanied them. They spent the summer at Um Ruwaba and went down to Omdurman in winter. In Omdurman Melik Gami' Kheir finally felt strong enough to throw off all allegiance to Ali Eisa. If the loyalty of the tribe was in doubt their difficulties were settled by the death of the latter at the Atbara.

The Meidob like so many of the indigenous Darfur tribes did not go out to fight at Omdurman, and fled on the day of the battle.

When Melik Gami' Kheir arrived at Meidob he found that his regent Rahma Gomo had been unable to contend against one Merzuk, sister's son to King Ahmed Aingeru and therefore with a claim to the throne, which he reinforced by publishing a report that Gami' was dead. He could not however stand up against Gami' in person.

Since that day their history has been uneventful. No one can be surprised that a tribe which has known its neighbours solely as enemies should still consider that other people's cattle are an excellent source of wealth if they stray too near the Jebel. What is more amazing is the strict regard for truth shown by most of the tribe. To lie is a disgrace to them, and having caught a Meidobi thief one rarely has to look for the evidence, which in most cases would be unattainable. They are a light-hearted people and when they can overcome the disadvantages of speech and timidity they display a humour much more kindly than the hard type of wit which appeals to the Arab. Their outlook is from a very insular point of view. The hospitality of the aristocracy is generous. Whether it is owing to these characteristics or to others which have escaped my notice or mention they have been popular with all English who have visited them.

On the difficult question of their race I will not say much. They undoubtedly believe they came from Dongola, their speech contains words which policemen from Dongola with me have recognised, and I believe I am correct in saying that matrilinear succession was in force in Christian Dongola before the arrival of the Mohammedans. In appearance the tribe are not unlike the Zaghawa, but are more bearded. Further investigation would require the direction of an expert. I can find no evidence of their ever having been Christians. Their recent and

still lingering religion seems to have focussed on three points, sacrifice and worship before sacred stones and trees, a great harvest festival, and resort to wise women as oracles. There is one magnificent tree near Malha with a small enclosure round it which I have always believed to be a sacred tree, but I could obtain no definite information of it or of any other. Sacred stones are more common. I have spoken of that in Malha crater. Another I have seen in a gorge of the Wadi Goldonut. It was covered with smaller stones which passers-by placed on it for good luck. There are several such. There is also a cave in a hill called Jebel El Nahas in Dar Turrti where barren women are accustomed to bring an offering of flour. The cave originally held the *nahās* (war drum) of the Turrti which arrived on the back of an untended camel one day at the hill. The drum disappeared less mysteriously when the Mahdist who seem to have had an insatiable appetite for such insignia, conquered the Gebel.

The harvest festival which I have not seen has been described by Mr. MacMichael. It takes place at a certain fixed time (the first week in October in 1926) and the Shelkota and the Urtti have each their assembly place, that of the former being close by Gebel Morgan. The young men, with unclipped locks whom Mr. MacMichael describes are at all times a common sight in the Jebel.

The sacred women or *todis*, who used to divine by throwing shells on the ground still exist and no doubt are still consulted. All Meidobis are very shy of speaking of their old faith, and are ashamed of their backwardness in the practice of Mohammedanism. But there is no doubt that the great majority of the tribe are still animists at heart.

Matrilinear succession is however still a potent force in Gebel Meidob. Originally this succession extended to all forms of property as well as to heirship to the throne. Of recent years however inheritance has always been from father to son, but a present is given by the son to his father's sister's son who would in old days have been the heir. The practice however has been maintained in succession to the throne (particularly in the Shelkota line, *see* Appendix II), and Melik Gami' is not anxious for his own son Mohamed Sayah, the Government nominee, to succeed him, as to him there is something unlawful in such an idea. I have noticed also that in selecting a new Omda he prefers the succession to be

in the female line. The story of the origin of the custom is that an early king was saved in battle by his nephew when deserted by his sons and so left the kingdom to the former. When I have put the matter to them, Meidobis have always agreed that the real reason is that under the loose moral code which prevails in the Jebel, the daughter's son will have more chance of being a true scion of his line than will the son's son who may be a bastard, without his father being aware of it.

The marriage tie is lightly regarded save as a compact which involves a payment of a dowry. Conjugal infidelity is not considered a serious matter, and after any festival something approaching promiscuity takes place. The dowry is not large, six sheep are given to the bride's paternal uncle as a betrothal portion and 15 to her brothers and cousins (father's sister's sons) on marriage. The bride's mother will also get a present.

The division of labour between men and women is concerned almost entirely with the animals, cultivation being negligible throughout the Jebel. Camels graze at a distance in the patches of *gizw* pastures around the hill. The universal camel brand is a horizontal line across the buttocks below the tail. Sheep hardly less than camels are here animals of the desert and can go 3 days unwatered. These are tended by the boys and young men for the most part who live houseless under the shade of the desert shrubs and taste nothing but milk. Goats being hardy enough to find a living on the sparse grass of the Jebel are tended by the women and children in the hill villages. The cows are likewise driven into the villages each night and are in the women's province until the fresh grass in the Gebel is exhausted. The women thus tend the cattle which need the more frequent watering and which return nightly to the villages. Camels and cows have adapted themselves with amazing agility to the steep hill tracks and the latter come galloping down to the wells without mishap by paths on which a man would go with caution. Great herds of donkeys roam apparently unowned across the Jebel, but though indistinguishable to a stranger's eye the women sort them out when they come down to the wells for water and load them with the large Meidob waterskins tied one over the back and another suspended from it below the belly.

I never saw donkey saddled in the Gebel nor tended by any save a woman. Chickens are not kept in the Gebel.

In fact one of the great difficulties in trekking for long in Meidob is to find food and fodder. Their cultivations are negligible in size and such grain as they import is for *merisa* and not for bread. *Merisa* and meat are the staple foods of the Meidobi. Beyond these and milk the traveller is not likely to receive much hospitality. Even milk is not easy to obtain except at one of the carefully concealed villages and in the evening; for here as in all Darfur the natives seem unable to milk a cow unless the calf is by, and usually one finds the calves in the village and the cows at the wells by themselves.

Their villages as I have said are usually carefully concealed in some glen among the hills, and present a most ragged appearance. Their method of house building is unlike that of any other Darfur tribe. They start by placing four uprights about 12 feet high at the corners of a square whose sides are perhaps $1\frac{1}{2}$ metres. These they make firm by cross pieces at the top. Against this stand they prop long branches resting on the ground, and so close-packed that even when uncovered with grass the dome-shaped house of logs gives a good shade. They then throw grass over the wood-work, but without any attempt at thatching, only inserting thorn twigs as a rule to keep it from slipping off. The house is remarkably roomy within. A usual plan seems to be that which gives them three rooms.

 The divisions are made of upright logs. Most houses have before them a little stand of logs containing a shelf on which they put their water-skins for coolness. The people themselves dress similarly to the other non-Arab Darfur tribes and show their liking for a bright colour, though the men do not deck themselves out in such gaudy colours as the Fur love, possibly because they have been less in contact with the towns where such stuffs can be bought. In fact though they are one of the richest tribes per head in Northern Darfur they have few luxuries of any sort. Clothes are usually rusty, and many still wear skins for an upper garment; the women do not wear silver ornaments with the profuseness of those in Arab tribes; sugar and tea are used in a very limited circle. The usual garment for men is the short *jibba*, the large garment with wide open sleeves being favoured by the leaders. The women wear the universal blue robe when they can afford anything better than the home spun cotton, which they buy in the Berti *süqs*; some wear only skins. Now-adays there is little if any weaving in the Gebel. The women seem to have no peculiar ornaments.

Their weapons also they seem to have borrowed from other tribes and they know only the spear, the rifle and occasionally the ugly Zaghawa *kurbāḡ*, a sinister looking throwing knife with two curved tongues branching from the main blade.

They are not great hunters possibly owing to scarcity of game in the Jebel and their lack of horses to run down the oryx *leucoryx* outside. Mountain sheep are found on Gebel Meidob itself and on Teiga to the west, but I never heard of a Meidobi killing one of them, or of the odd kudu. I have been told of them rounding up oryx by driving them into one of the creeks running into the high Teiga plateau and there spearing them.

The Meidob dance deserves a word of notice. The women all collect in a group and continue jumping straight up in the air. The men, each with his spear, stand some fifty yards off. Then one by one with a kind of hop skip and jump they advance towards the women and form a jumping group opposite to them and there they continue until most have fallen out through exhaustion. This they repeat indefinitely. There is a modified form of the dance for old men who lunge with short sticks at the women instead of jumping.

Music is confined to the pipe of oryx horn. I have heard three tunes, including the shepherds' song and the Urti "National Anthem." One of the most pleasant memories I have of Gebel Meidob is that of stopping in an apparently deserted wadi at night and hearing a shepherd boy piping.

Meidob native names are largely those of animals; Tigl, Kubbsb, Naga, Nimr and Tor being the most common Arabic equivalents.

APPENDIX I.

SHELKOTA KINGS. (AURUNGIDE LINE.)

Toké.	Byeri
Buéri.	Bagári.
Abiad.	Ahmed Aingeru.
Idris.	Gami' Khair.
Belugo	

URRTI KINGS.

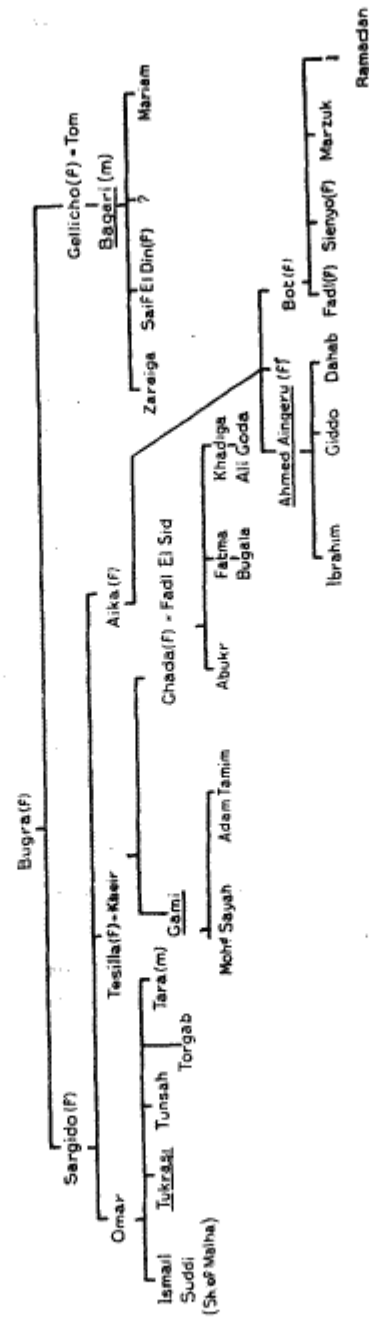
Uchuringé.	Hashim Sarraf.
Shatti.	Ezeirik Eisa.
Abukr.	Fertisha Eisa.
Hassan.	Ali Eisa.
Tille.	Mansur Suliman.
Tawdirri.	Hamid Suliman.
Ougir.	Mansur Suliman (reinstated and
Kolginde.	again deposed).
Adila Wad Tawdirri.	

TURRTI KINGS.

Timlig.	Adam Said Kosango (reigned 98
Koiniono.	years).
Urro.	Abdullahi Hassan.
Said.	

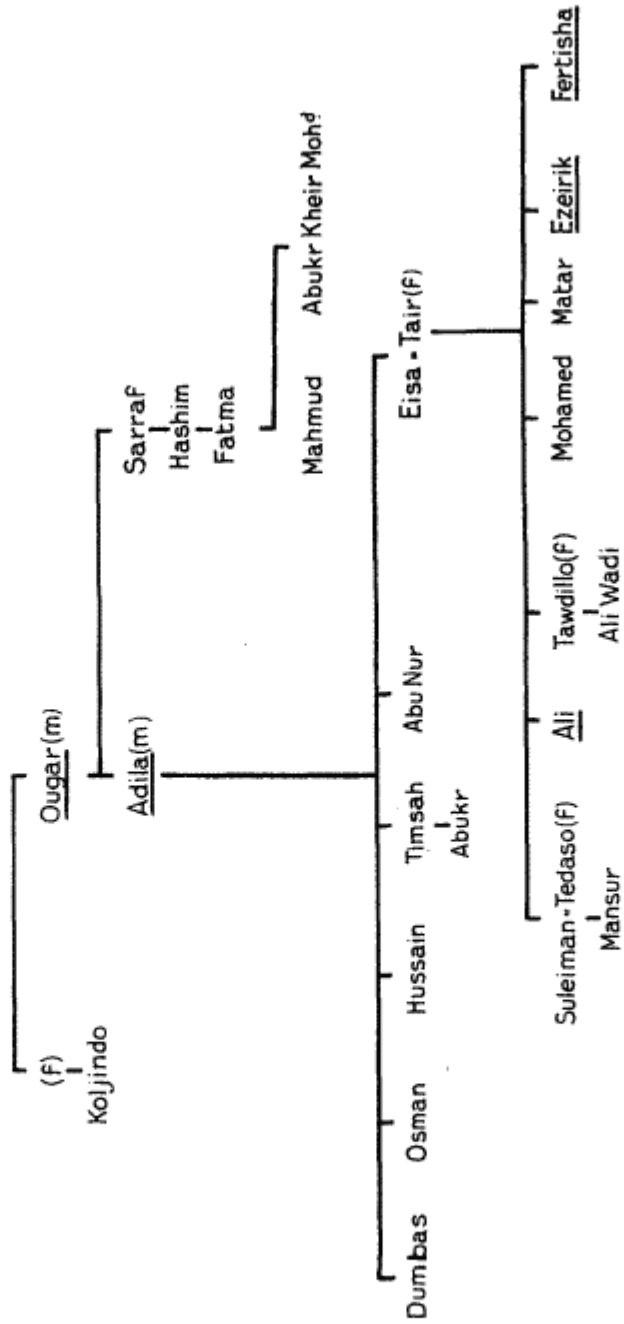
APPENDIX II

Shelkote Family tree. Aurungide line. m = male. P = Female. Kings under-lined.



APPENDIX III.

Urrti Line.



THE GAME-BIRDS AND WATER-FOWL OF THE SUDAN.*

By W. Wedgwood Bowen.

(PLATES I and II.)

* Continued from SUDAN NOTES AND RECORDS, Vol. IX, No. 1, p. 124.

III. THE SANDGROUSE. FAMILY PTEROCLIDIDÆ.

Key to the species of Sandgrouse occurring within the Sudan.

- Tail wedge-shaped, middle pair of feathers distinctly longer than the succeeding pair and acutely pointed at their tips (*see* Plate I, Fig. 1, *a* and *b*) ; 16 tail-feathers. Wing narrow and pointed (*see* Plate I, Fig. 2, *a*). Male without white on the forehead, and without a broad bi- or tri-coloured pectoral band ; throat washed with yellow. Diurnal in drinking habits ... See 1.
- Tail rounded, or fan-shaped, middle pair of feathers not longer than the succeeding pair and rounded at their tips (*see* Plate I, Fig. 1, *c*) ; 14 tail-feathers. Wing somewhat broader and rounded at the tip (*see* Plate I, Fig. 2, *b*). Forehead of male white, crossed by a black bar ; a broad bi- or tri-coloured band across the breast ; abdomen narrowly barred with black ; throat not washed with yellow. Crepuscular in drinking habits ... See 6.
1. Middle pair of tail-feathers greatly elongated (*see* Plate I, Fig. 1, *a*) ... See 2.
Middle pair of tail-feathers not greatly elongated (Fig. 1, *b*) ... See 4.
2. Abdomen chestnut, a single narrow breast-band ... Chestnut-bellied Sandgrouse (male)
Abdomen black with buffish bars ; a narrow broken breast-band ... Chestnut-bellied Sandgrouse (female)
Middle of abdomen black, without barring ; no breast-band ... See 3.
3. Breast uniform ... Senegal Sandgrouse (male)
Breast spotted ... Senegal Sandgrouse (female)
4. Breast spotted ... See 5.
Breast barred ... Crowned Sandgrouse (female and young)
Breast uniform ... Crowned Sandgrouse (male)
5. Abdomen and flanks black barred with buff ; upper parts barred with black ... Chestnut-bellied Sandgrouse (young)
Centre of abdomen black, flanks uniform whitish buff ; upper parts spotted with dull black ... Senegal Sandgrouse (young)
6. Sides of throat and upper breast narrowly barred with black ... Lichtenstein's Sandgrouse.
Throat and upper-breast uniform sandy buff ... Four-barred Sandgrouse.

NOTE ON THE DISTRIBUTION OF SANDGROUSE IN THE SUDAN.

In the two previous parts of this paper, those dealing with the Bustards and the true Game-Birds, maps were given to illustrate the approximate, or probable, distribution of the various species occurring within the country. These maps were based upon the available records, but to a large extent they were founded on guess work, and are, therefore, only provisional.

The distribution of the five Sudan species of sandgrouse conforms to such a remarkable extent with the avifaunal divisions, as propounded by Chapin and Lynes, that a general avifaunal map is here given (Plate II) instead of one illustrating merely the ranges of the five species, and references are made in the text to the particular divisions in which any one species may be expected to occur. The map is reprinted from my "Catalogue of Sudan Birds" (Sudan Gov. Mus. (N.H.), Publ. No. I, 1926) and, as was stated in the introduction thereto, is, in its main divisions (indicated by the broad red lines) a repetition of a small portion of the Avifaunal map of the Ethiopic Region as propounded by Dr. J. P. Chapin (Amer. Nat. LVII, 649) and modified slightly by Admiral Lynes (Ibis, 1925, p. 761, and 1926, Plate VIII). The minor divisions are my own, made with the help and expert advice of Messrs. G. W. Grabham and A. A. R. Boyce, of the Geological and Survey Departments.

I. THE CHESTNUT-BELLIED, OR SINGED SANDGROUSE, *Pterocles senegalensis senegalensis* Licht

Description

Male.—Length 13 inches, wing 7.2, tail 6. Upper parts, head and breast sandy buff, with a greenish tinge on the back; feathers of the scapulars and wing-coverts tipped with blackish chestnut, giving the whole an irregular broken-barred effect. Flight feathers brownish black, inner webs and tips of secondaries creamy white. Tail sandy buff, indistinctly barred with black; 16 tail feathers, middle pair greatly elongated (see Plate I, Fig. 1, a). Throat washed with orange-yellow; a narrow black band across breast, edged with white in front; rest of under parts chestnut. Bill and toes pale slate grey; iris dark brown.

Female.—Upper parts sandy buff, barred somewhat irregularly with black. Wings and tail as in male. Top of head and neck sandy buff streaked with black; sides of face and throat washed with pale orange yellow. Breast sandy buff spotted with black and with an irregular broken band of black; rest of under parts black, narrowly barred with pale sandy rufous.

Distribution

Senegal eastwards through the Nile valley to Abyssinia. In the Sudan, the drier northern provinces only. [Arid (scrub) and arid (Acacia-grass) on Map, Plate II.]

Sub-species

A form, *P. s. erlangeri* (Neum.) takes the place of typical *P. s. senegalensis* to the east, ranging from Arabia to north-western India. Southward two other races occur: *P. s. somalicus* (Hartert) in Somaliland and northern Kenya Colony, and *P. s. olivascens* (Hartert) in the Killimanjaro and Ukamba regions of Kenya Colony.

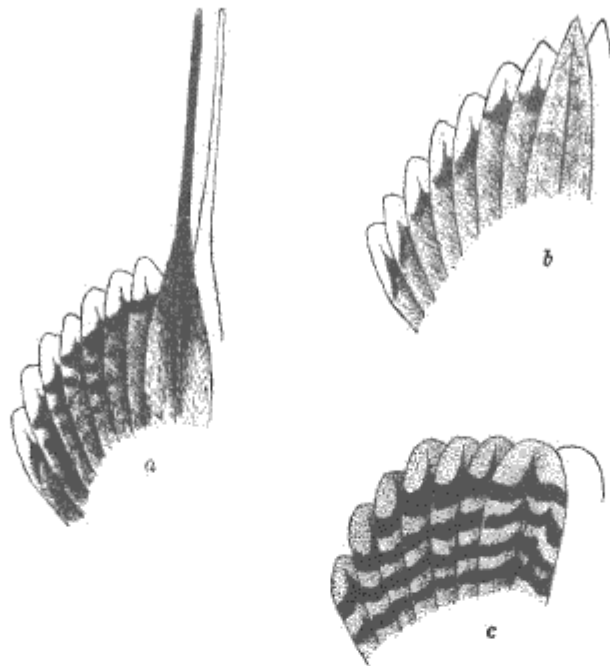


FIG. 1.—Right half of tail of : *a*, *Pterocles senegallensis* ; *b*, *P. coronatus* ; *c*, *Nyctiperdix lichtensteinii*.

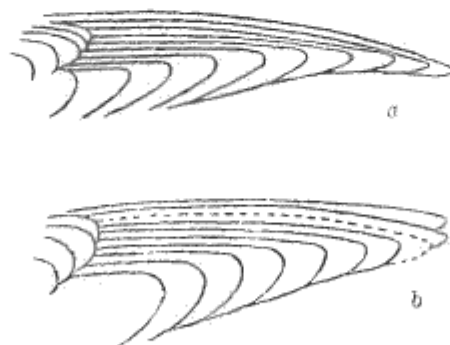


FIG. 2.—Right wing of : *a*, *Pterocles senegallus* ; *b*, *Nyctiperdix lichtensteinii* (third outermost primary missing in specimen, but indicated by dotted line in figure). Both figures reproduced from Amer. Museum Novitates, Number 273, September 6th, 1927, by courtesy of the American Museum of Natural History.

This is the commonest of the three species of sandgrouse that visit the rivers during the early morning to drink at the edges of suitable sand-bars and islands. Usually about 75 to 80 per cent. of the majority of sportsmen's bags consists of this species.

Inhabitants of the dry, thin scrub-desert country of the north, these sandgrouse nevertheless keep within flying distance of the river. To what distance they penetrate out into the desert each morning after drinking it is difficult to ascertain. Butler (3) estimates this at fifty miles at least, and probably much more. During the rains, when inland pools are formed they, no doubt, spread much further and are seldom seen at the river's edge.

In the early morning, parties of these birds are frequently observed feeding on the seeds of weeds and grasses growing on the fallow cultivated lands and thin scrub of the riverside. The weed "amioga" (*Tephrosia apollinea* D. C.) is, according to King (19), the favourite food, and wherever this weed flourishes sandgrouse may usually be seen feeding. Between the hours of seven and nine each morning with clockwork-like regularity they flock to the river to drink, flying sometimes singly or in pairs, though more usually in flocks of fifty to a hundred or more. Wheeling and circling at a great height for some time before alighting at the water's edge, they choose always the gently sloping sandy edge of some convenient sandspit, or island, to which each morning they return with never-failing regularity. A few seconds are spent, usually, in pecking around at the water's edge, then a hurried drink and away back into the desert they fly. Sometimes a further short period of feeding at the riverside cultivation and scrub is indulged in before they make their way out into the desert to lie up, in scattered flocks, during the heat of the day.

"On several grassy flats near the river" in the White Nile region Witherby (20) records that a number of these sandgrouse "were to be found all day, and they seemed to live and feed there in preference to the arid tracts. But at these spots there were always other individuals, which came down from the desert in the usual way to drink in the morning, and flew back again at once, and others again which came from the desert and after their drink settled down upon the grassy flat."

At least in the hottest days, if not throughout the summer, and possibly also occasionally in the winter, they come to water again in the late afternoon, though at this time there is never so marked a flight as

at morning. During the night they become more gregarious, no doubt as a means of protection from the ravages of their prowling nocturnal enemies, and Stuart Baker (22), writing on the Indian sub-species, remarks upon the difficulty with which they are surprised and the comparative scarcity of feathers and other tell-tale signs of nocturnal encounter.

The characteristic, penetrating, double call-note, uttered constantly during flight, is usually heard long before the birds come into view, thus providing the sportsman ample warning of their approach. This, together with the massed formation of flight and the persistence in coming to the same spot each morning to drink, does not enhance the merits of this species as a sporting bird. More often than not, even when a bird on the very outskirts of the flock is picked, two or more fall to a shot. They take a fair amount of hitting notwithstanding, and many a wounded bird escapes the sportsman's bag only to perish in the desert. As an example of its tenacity for life I recall once seeing a bird whose abdominal wall had been torn open by a shot, yet it continued to fly, with intestine hanging out streamer-like behind, until nearly out of sight (watched through a powerful pair of binoculars) before it fell in the desert.

The breeding season of this and other species of sandgrouse in the Sudan is in spring and early summer, and at this time they are protected by law. Rothschild and Wollaston (21) found eggs of this bird on several occasions in Berber Province in March. The eggs, three in number, though sometimes only two, are laid usually in a slight depression in the desert, seldom with any cover above, and with little, if any, lining of grass; they are somewhat long and cylindrical, slightly glossy, and of a greenish-white ground, spotted and blotched with dull and deep purplish brown. Average measurements (22), 1.45×1.03 inches. The ground-colour is somewhat variable, being sometimes pinkish-stone colour or pale olive-brown.

Incubation is performed by the female during the day and by the male at night. He it is who, by saturating the feathers of his breast at the river's edge, conveys water to the young who remain far out in the desert until able to fly. This habit is well described by Meade-Waldo (23) from observations made on captive birds, as follows:—

“Between the years 1895 and 1915 sixty-one broods of Sand-Grouse were hatched in our aviaries. Almost all the eggs laid were fertile and hatched, and about two-thirds of the young were reared. The Sand-

Grouse were of three species—*Pterocles alchatus*, *P. exustus* (*P. senegalensis*), and *P. arenarius*. The great majority were of the first species, only seven broods of *P. exustus* and three broods of *P. arenarius* being reared. The breeding habits of all three species being precisely similar. The female sitting by day and the male by night, incubation lasted about twenty-three days, but was influenced by the weather—in very hot weather *P. exustus* hatching in seventeen days on one occasion. The young are carefully attended by both parents, but are strong and feed themselves from the first. Water is conveyed to the young in the following curious manner, by the male only . . . The male rubs his breast violently up and down on the ground—a motion quite distinct from dusting—and when his feathers are awry gets into his drinking-water and saturates the feathers of his underparts. When soaked he goes through the motions of flying away, nodding his head, etc.; then, remembering his family is close by, he would run to the hen, make a demonstration, when the young run out, get under him, and suck the water from his breast, the appearance being that of a mammal suckling her young. The young pass the feathers through their bills, and keep changing places until the supply becomes exhausted.

“Until the young can fly *they take water in no other way*, and the cock gives it to the young *only*.”

II. THE SENEGAL OR SPOTTED [SANDGROUSE, *Pterocles senegallus* (Linn.)

Description

Male.—Length about 13 inches (to tip of tail), wing 8, tail 5·4. Upper parts sandy-buff; scapulars, greater wing-coverts and secondaries dull brown tipped with buff; primaries pale buff, shading to brownish-black towards the tips. Outer tail-feathers brown with broad white tips; middle pair sandy-buff, greatly elongated and dusky black at the tips; 16 tail-feathers. Lores and a band encircling the back of the head pearly-grey; throat and sides of neck washed with orange yellow. Under parts, sandy-buff, slightly greyer on the breast; centre of abdomen black. Bill and toes lead coloured; iris brown.

Female.—Entire upper parts and breast spotted with black; lacks the grey on the head and neck; otherwise somewhat similar to the male.

Distribution

North Africa, from the Algerian Sahara to Egypt, Arabia and Somaliland, eastwards to Northern India. *In the Sudan*, the northern, arid half only. No sub-species are recognizable. [Arid (scrub) and arid (acacia-grass) on Map, Plate II.]

Although coming to water at the same time and usually to the same sandspit as the preceding species, this sandgrouse cannot be said to associate with it, for the individual flocks are invariably of one kind or the other. Never, in the many hundreds of flights watched, have I seen a mixed flock. Compared with the chestnut-bellied bird, from which this species may readily be distinguished on the wing by its larger size, more direct flight, and paler under surface, it is a much less common bird. Seldom is it observed other than in pairs or threes and fours, and, in consequence, as a sporting bird it ranks high. From the crowned sandgrouse its differentiation on the wing is not so easy, though fortunately as the ranges of the two coincide only in the extreme northern provinces, confusion of the two is only likely in such regions. The elongated tail-feathers, paler colouration of the wing quills, and black patch on the belly in this species are diagnostic characters often visible at considerable range in the field.

In general habits this and the following species are rather similar to the preceding *P. senegalensis*: feeding in and around the scrub and cultivation of the riverside in the early morning, coming to drink regularly at about 8 in the morning and then retiring out into the desert to lie up during the heat of the day. According to Rothschild and Wollaston (21) even out in the desert this species keeps apart from the others and seems "to prefer thick bush rather than the more open desert."

The breeding season coincides with, and the nesting habits are similar to, those of the preceding species; the eggs, also, are somewhat similar in colour and general form. Stuart-Baker (22) gives the average measurements of 20 eggs from various localities in India and North Africa as 1.66 inches $\times$ 1.12.

III. THE CROWNED SANDGROUSE, *Pterocles coronatus coronatus* (Licht)

Description

Male.—Length about 11 inches, wing 7.1, tail 3.2. Very similar in general appearance to the male of *P. senegallus*, from which, however,

it may be distinguished at a glance by the absence of elongated central tail-feathers (see Fig. 1, *b*), by the black around the gape and by the absence of black on the belly.

Female.—Rather similar to the female *P. senegallus*, but may be distinguished by the short tail, and by the broken black barring which takes the place of the regular round spots in the latter.

Distribution

The Algerian Sahara east to Tripoli, the Wadi Natrun region of western Egypt and the northern Sudan. *In the Sudan*, as far south as Dongola Province and the desert regions of northern Kordofan. [Arid (scrub) on Map, Plate II.]

Sub-species

A form, *P. c. atratus* (Hartert), which differs but slightly, takes the place of the typical African sub-species in north-western India.

This sandgrouse takes its name from the supposed crown—two black bands, one on either side of the forehead—in the male. It is an inhabitant of the most desert regions of the northern provinces, and is for this reason the least known of the three morning-drinking species. In general appearance it is very similar to the Senegal bird, from which, in the field, it may usually be distinguished by the absence of black on the abdomen, by the shorter tail and somewhat darker wing-quills. The relatively short middle tail-feathers of this species, in contrast to the great elongation of these feathers in the preceding species (see Fig. 1, *a* and *b*), lead W. L. Sclater (25) to separate generically all the short-tailed birds under the name *Eremialector*. This division, in the writer's opinion (26), is not a natural one and should not be adhered to.

Like the preceding species, this sandgrouse feeds in the vicinity of the river early each morning before repairing to the gently sloping, sandy point of a near-by island, or sand-bar for its customary morning drink. Again, according to King (19), it may occasionally betake itself to the riverside cultivation, or scrub, to feed in the late afternoon. Within its range it is a somewhat more common bird than the Senegal sandgrouse and flies more often in small flocks or parties of 15 or 20.

The breeding habits are similar to the two previous species, and the eggs are of typical sandgrouse shape and colour; measuring 1.58×1.07 inches [average of three, given by Stuart Baker (22)].

IV. LICHTENSTEIN'S SANDGROUSE, *Nyctiperdix lichtensteinii*
lichtensteinii (Temm.)*

Description

Male.—Length 9.7 inches, wing 7, tail 2.8. Upper parts and chest pale whitish buff, closely barred with black. Forehead, lores and superciliary stripes white; a wide black band crosses the forehead just in front of the eyes; a small, oval, black spot above each eye. Head and throat more streaked and spotted, than barred, with black. Outer webs of the outer secondaries almost entirely white, with four, or more, oblique black bars; rest of flight feathers brownish black. Tail rounded and distinctly barred; 14 tail-feathers (see Fig. 1 c). Upper breast yellowish buff, divided in the middle by a narrow, dark, chestnut (sometimes black) band and separated posteriorly from the rest of the under parts by a black band, giving the breast a three-banded appearance; rest of under parts narrowly barred black and white. Bill brownish flesh colour; iris brown; feet whitish yellow.

Female.—Like the male, but lacks the white and black on the head and the bands on the upper breast.

Distribution

The northern, arid half of the Sudan. [Arid (scrub) and arid (acacia-grass), possibly also to some extent penetrating the Savana belt, see Map, Plate II].

Sub-species

In the central districts of the Sahara a race, *N. l. targius* (Geyr.) occurs. Another form, *N. l. abessinicus* (Geyr), of doubtful distinction, takes the place of the typical Sudan bird in Eritrea, Abyssinia and northern Somaliland; while further south, *N. l. hyperythrus* (Erl.), inhabits southern Somaliland and perhaps northern Kenya Colony, and *N. l. sukensis* (Neum.) the drier, inland parts of Kenya Colony. Eastwards, through Arabia to Beluchistan and Sind, the species is represented by the race *N. l. arabicus* (Neum.);

Owing to the distinctly crepuscular habits of this and the succeeding species, they much less often take a place in the sportman's bag than do any of the three diurnal drinkers. It is a relatively scarce bird, occurring sparsely throughout the arid scrub regions of the northern provinces.

*For use of the generic name *Nyctiperdix*, A. Roberts, *Annals Transvaal Museum*, VIII, Part 4, Oct. 30th, 1922, pp. 195, 196; genotype *Pterocles bicinctus* Temminck, see Bowen (26).

King (19) describes it as rather resembling the English partridge in its habits in that each covey occupies a certain small area in which it may always be found. Butler (6) writes on its habits as follows :—

“These beautiful Sand-Grouse were fairly plentiful in the Khor Arbat and at Jebel Bawati (Red Sea Province). I saw little of them in the daytime, beyond flushing a few occasionally among the rocks, but every night small parties of them came flying down to the Khor to drink, until considerable numbers were collected along the stream. They did not arrive at the water until dusk was merging into darkness, but continued to come until after 8 p.m. Indeed, it was most difficult to see to shoot even the earlier birds, as they flew low, and the high hills shutting in the khor prevented me from getting them straight against the skyline. The call of the species is a sharp, clear double whistle, like ‘quittoo! quittoo!’ repeated two or three times, and by 8 o’clock this, and an occasional rattle of wings, sounded on all sides, long after the birds themselves had become invisible.”

Lynes (2), telling of the habits of this bird in Darfur, says it “came in numbers in the regular Sand-Grouse fashion in troops of varying size, to drink at the water-holes and crater lake in Meidob, and at Madu and Sayah at the slopes round the well-holes.

“The birds came in to drink very late in the evenings and early at dawn; those at the wells almost in the dark, as A. L. Butler describes in the Red Sea Province, and with the same rather Wigeon-like whistle note. There was also a little double croak, perhaps made only by the females or reserved for the breeding season only. The extra early and late visits to the wells were clearly made in order to avoid the ceaseless stir of folk and beasts there from dawn to dusk; but the birds had perhaps been wiser to take their chance in daylight with the Weaver-Finches, Doves, and such-like, and thus avoid the hair-springs with which small boys took considerable toll of the Sand-Grouse, for these could not have been set among the trampling herds, and everyone is much too busy then to bother about birds or to be bothered by the sporting requirements of the *walad*.”

The above-quoted excellent descriptions of this species leaves little, or nothing, for me to add from personal experience of these birds either at Erkowit, in the Red Sea hills, or at the wells and khors around Kassala, at both of which localities they were common. It seems doubtful whether

this species ever drinks at the sloping, sandy edges of the river, so necessary to the requirements of the three diurnal birds. On several occasions I have lain in wait for them at such locations as are known to be frequented regularly by *senegallus* and *senegalensis*, from dusk well on into the night, but always without result. Once I disturbed what, from the call-note, I judged to be a covey of these birds drinking at the trough of a *sagia*, which had but a few minutes earlier closed down for the night. It is at such places—wells, water-holes, troughs of *sagias*, and pools in *khors* with high banks—rather than at the open river, that this species seems to drink by preference.

Perhaps one of the best accounts of the habits of this species is that given by Blanford in his "Geology and Zoology of Abyssinia" (quoted by Stuart Baker, 22): "This bird," he says, "has precisely the same habits as the closely allied *P. fasciatus* of India. It is rarely, if ever, seen on open sandy places, like *P. exustus*; it keeps to bush and thin tree jungle, and is usually found solitary, in pairs, or at most two or three pairs together. I once came on a considerable flock in January, and possibly at that time these birds may collect in large numbers, but in May, June, July and August it was rare to see more than four together, excepting about watering-places. When disturbed the Sand-Grouse rise with a sharp cackling cry, affording a very difficult shot. It does not rise high, and usually settles again after a short flight. All kinds of *Pterocles*, as is well known, fly to water at particular hours in the day, the hours varying with different species. *P. exustus* drinks about 9 a.m. and 4 p.m. In the present case the drinking hours are at daybreak in the morning, and at dusk in the evening, as is also the case with the Indian *P. fasciatus*, the crepuscular habits of which are mentioned by Jerdon ("Birds of India," Vol. II, p. 498), and have been noticed by myself also. In the semi-desert country west and north-west of Massowah, in which *P. lichtensteinii* abounds, and there are but few places where water is found, the scene at each spring of an evening, after a hot day especially, is very interesting. At Saati, Ailat, and Ain, there was a constant rush of these birds from sunset till dark, and again in the morning before sunrise. Singly and in small flocks, uttering their peculiar "queep-queep" like note, they flew up and down the watercourse on their way to and from the water, keeping only a few feet above the bushes and low trees, the noise of their wings being heard in the dusk before the birds themselves appeared. Like

all other Sand-Grouse, they are excellent eating, the flesh being rather hard but of delicious flavour, and our party used generally to shoot a few each evening, not an easy matter, for the great swiftness and power of wing possessed by these birds rendered them, in the dusk especially, by no means easy to shoot."

The food of this, as with other species of sandgrouse, appears to consist entirely of small seeds. Butler (6) records the crop of one examined by him as being "full of the seeds of an acacia."

Little has been recorded on the breeding habits of this species. Lynes (2) found its breeding in Darfur in February, in which month he obtained specimens of a female laying eggs and a juvenile just fledged.

The egg is described by Stuart Baker (22) as being of a "dirty yellowish stone colour, or earth colour, rather profusely covered all over its surface with largish blotches of dirty vandyke brown, and with others again underlying these of dull lavender grey. It is of a dull, glossless surface, with a texture comparatively rough to both touch and sight," and measures 1.70 × 1.20 inches.

V. FOUR-BARRED OR PAINTED SANDGROUSE, *Nyctiperdix quadricinctus lowei* (Grant)

Description

Male.—Length 9.5 inches, wing 7.5, tail 3.75. Somewhat like the male of *lichtensteinii*, from which it may readily be distinguished by the absence of barring on the throat and upper breast. A white band, bordered in front by one of dark chestnut, and behind by one of black, crosses the breast (a fourth band is said sometimes to be present). Wing-coverts and secondaries crossed by a single black bar, margined on both sides with white; innermost secondaries with numerous black bars and no white ones.

Female.—Like the female of *lichtensteinii*, but lacks the barring on the throat and upper breast.

Distribution

Upper Nile valley, south to the northern part of Uganda. *In the Sudan*, from Kordofan and Fung Provinces southward. [Savana I, II, III and IV, and arid (acacia-forest) on Map, Plate II.]

Sub-species

The typical form, *N. quadricinctus quadricinctus* ranges from Senegal eastwards to the Lake Chad region. East of this the present form, which is the only race, takes its place.

The name "four-barred" is really a misnomer, as only three breast-bands are the rule. According to some, it is the barring on the wing to which the name refers; in either case the character is not an apparent one, and "Painted Sandgrouse" is a far more appropriate common name.

This beautiful bird is the southern counterpart of Lichtenstein's sandgrouse; it is an inhabitant of the savanna regions, penetrating the arid districts only where the dry acacias have reached their most luxuriant growth, as in the southernmost parts of Darfur and Kordofan, and in the Rahad-Dinder-Setit country of Fung and Kassala Provinces. Hawker (27) found it "on the edge of the scrub near the river" in the White Nile region, but did not notice it south of Renk, nor north of El Dueim. Butler (3) writes of its distribution as follows:—

"This handsome Sand-Grouse seems to be entirely a bird of the black cotton-soil and thorn-scrub, and does not appear to occur on the sandy deserts at all. It does not range so far north as the other species, nor have I ever seen it in anything approaching the same quantities. It is, however, tolerably common in the bush on the White Nile, Sobat, and Bahr-el-Ghazal, and on the Blue Nile, Rahad, Dinder, Atbara, and Setit. It is generally met with among thorn trees, in pairs or small parties."

Lynes (2) gives a similar account of its distribution, as follows:—

"As on the White Nile, south of Fashoda, in Darfur, a bird of the richer bush and light woodland country; evidently a savanna-belt species not found in the arid except where the former protrudes, as it were, to the northward of its general 10° latitudinal border, as it does somewhat in Central Darfur, S.E. Kassala, and E. Sennar, the Rahad-Dinder-Setit country, etc."

Like *N. lichtensteinii*, this species is crepuscular in its drinking habits. Lynes (2) says, in Darfur, it "flighted down to drink at the open pools in small troops of six to twelve, chiefly in the evening, starting regularly about twenty minutes, and finishing about fifty minutes, after sunset. On each trip they only stayed a few minutes at the water,

then returned as they had come. The birds took in a lot of water—one, a female laying eggs, shot on her return journey, drained out nearly a sherry-glass full. Their drinking-places here were in spots little frequented by people, and the youth of Kallokitting caught numbers of birds with hair-springs at the water.

"When the first showers came in May, these birds drank at little pools of rain-water lying on rock-slabs, perhaps glad to be no longer tied to a routine spot.

"In mid-June we had numbers in the more open spots of the Kulme woodlands undergoing their complete moult; these birds all cleared out as they got their fresh plumage before the grass grew up, probably going to drier ground to the northward.

"In flight it is a more silent bird than the other two (*P. senegalensis* and *N. lichtensteinii*), but when flushed rises with a harsh gabbling sound."

South of the Sudan, Sir Frederick Jackson (28) says:—"On the Upper Turkwel it arrived at dusk, and at the same drinking place with *F. lichtensteinii sukensis*, but it was quite impossible to distinguish one from the other. Specimens of both were obtained by standing close up to the river bank, and shooting as they approached low down against the sky-line, like driven birds at home, or by a chance pot-shot at the water's edge when they were quite invisible." In the Sudan, however, there are few places where the ranges of the two species overlap sufficiently for them to be confused.

Butler (3) found it breeding in fair numbers on the Dinder River in March, 1903. He says: "On the 19th, while tracking up a wounded bull buffalo, I came on a nest containing two tiny young in down—pretty little blackish-brown things marked with whitish lines. On the 20th, I took a clutch of three fresh eggs, and on the 24th another clutch of three, slightly incubated.

"It might be supposed that the pinkish colour of the eggs of this bird would render them conspicuous on the black cotton-soil on which they are laid. As a matter of fact, all that I saw were deposited among the scattered fallen leaves of a species of *Bauhinia* (Camel's Foot Tree) which dry to exactly the same clay-pink as the eggs, and among these leaves they are very difficult to detect."

Later, in 1907, Butler (4) again found this bird breeding in the Bahr-el-Ghazal, where he took a clutch of three fresh eggs at the Pongo River on February 7th.

At Kallokitting in mid-April, 1920, Lynes (2) says: "This species was common, and dispersed for breeding on a dry bush-grown plateau adjacent to the swamp. . . ."

"We found no nests here, but on 16 February, 1921, on a similar piece of ground in north-eastern J. Marra, we disturbed numbers of birds, one of which rose at our feet from a single egg.

"We could find no more nests; and since next day nearly all the birds were gone, and the egg was deserted though we had carefully avoided touching it, I concluded it to have been a premature laying."

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SOME AUTHORS OF THE SOUTHERN SUDAN.

By G. O. Whitehead.

NOTHING proves so thoroughly that the ability to write interestingly is not such a very uncommon gift as books of exploration. There is hardly one among those Europeans who opened up the reaches of the Upper Nile who has not a book of some sort to his credit. It is not true that they all wrote well; some were the merest amateurs. Baker at his worst writes like a schoolboy, Mrs. Petherick writes with a strong reminiscence of the novels of her period, Emin is tiresome when he tries to be humorous, and Casati or his translator show how little feeling they had for the style appropriate to native legends when they speak of an elephant as "the great pachyderm."

Faults of style are not their only shortcoming. In point of craftsmanship, and in matters of accuracy and information, there are only two that can be said to be good, and they are superlatively good—Schweinfurth and Emin. Both of these men had the meticulous conscience of the scientist; they observed with care, and described with precision. Schweinfurth, too, was an artist, and his illustrations stand out among the extremely indifferent illustrations of all the other books.

They wrote interestingly because their subject absorbed them. They were far too busy crowding their note-books with all kinds of miscellaneous information, and applying their knowledge to bring order and meaning into the immense range of facts that they collected, to take much trouble to describe their own subjective impressions. Hence, with the exception of Stanley and Casati, there is little deliberate effort at fine writing.

We would not miss any of those books we have, and there are many others, now probably scarce and difficult to obtain, that we should like to read. Where are the "*Annales de Voyage*," by Andrea de Bono, a Maltese ivory trader, to be found? and where "*Le Fleuve Blanc*," by Jules Poncet, one of two brothers who traded in the Bahr el Ghazal somewhere in the sixties? and where are "*Travels East and West of Gondokoro*," by

Father Morlang? which would give us perhaps our earliest information about the Nyangwara and the Lokoya. Perhaps some day the *Sudan Notes and Records* will collect a representative set of such early works, and rescue the first accounts of Nilotic tribes that now lie buried in the transactions of German geographical societies.

Part of the charm of this literature of the Sudan lies in the diversity of its authorship. There is a succession of the most various nationalities. They come and go through the pages of these books—some to achieve fame and some to disappear into the obscurity of a footnote. Dr. Edward Schnitzer, of Antivari, emerges a little later as Emin Pasha, while the romantically-named adventurer, Alphonse de Malzac, is neither remembered as the founder of Rumbek, nor as a “monster of iniquity,” nor as a good botanist, all of which things he is said to have been.

Perhaps the first Europeans to write anything about the Southern Sudan were the Austrian missionaries, who in the year 1848 came down the Nile to found their stations of Sante Croce in the Dinka country and Gondokoro among the Bari. By about 1860 their stations were being given up, and Baker gives a sad account of the breaking-up of Santa Croce, which was happening just at the time he was sailing south to the assistance of Speke and Grant. We know little beyond their names—Knoblecher, Morlang, Ryllo, and others. Anonymity seems to have pursued them. The earliest account of the Bari was written by them; several of them contributed the result of their labours to an Austrian professor, Dr. Mitterrutzner, who, with the help of a young Bari brought to Europe, compiled a grammar and dictionary of the Bari language. When this work was translated into English its authorship was omitted, and the one substantial material result of their ten years' labours and sufferings thus unacknowledged. Considering how little comparative material existed at that time, the accuracy and scope of this grammar is surprising, and in any work on Bari it cannot be neglected. But a dictionary is a barren ground for gleaning personal details of its authors. A strange figure (Abu Suliman) appears in several of the grammatical examples, and questions are asked about his goings and comings. This, it may be explained, was the nickname by which Father Knoblecher, evidently a favourite with the natives, was known all up and down the Nile.

John Petherick, who was the first Englishman to trade on the White Nile, and was for a short time Her Majesty's Consul, published two books, "Egypt, the Sudan and Central Africa," in 1861; and "Travels in Central Africa," in 1869.

The latter book is interesting for two reasons: in the first place, it contains a long account, from Petherick's side, of his quarrel with Speke and the Royal Geographical Society on the question of how far he fulfilled his undertaking to meet Speke at Gondokoro on his journey from the Lakes; and secondly, Mrs. Petherick, who collaborated with her husband and was a far more picturesque writer than he, provides us with a pleasant study of a very adventurous but always uncompromisingly Victorian lady.

When we read her diaries and letters we can almost imagine that we behold that 60-year-old correspondence which she addressed to her sister, Mrs. McQuie, of Blundell Sands, Liverpool. She wrote with a curious inversion of phrase, to emphasise those emotions that she so easily and constantly felt. She drew with accomplishment, copied plants and flowers, collected geological specimens, more because they were pretty or curious than for any other reason, and always called her husband "Petherick" or "Peth."

Their travels occupied the years 1862 to 1864, and even for those days they seem to have met with more than their share of illness and disaster. "I am convinced," says Mrs. Petherick, in the early days of her stay in Khartoum, "that, to a certain extent, health is in our own hands—regular exercise, no abandonment to the noon hour's sleep usually indulged in by residents here, moderate living, rising before the sun, going to bed some three hours after its setting, and a careful regard to the chills and heat of the country. Flannel, heretofore my detestation, is indispensable." They took with them "cases of dainties, such as arrowroot, sago, oatmeal, brandy, port wine, and raspberry vinegar." These were only to be opened "when any of us were ill."

But flannel and raspberry vinegar were poor weapons against tropical disease, and their party suffered severely.

After a tedious voyage up the river into the Dinka country, the Pethericks decided, because of the obstruction of the sudd, to send on

one boat to Gondokoro, and to travel themselves by land, through the Aliab, Mandari, Shir, and Bari country, coming into Gondokoro from the west.

The party started off on August the 1st, 1861, to make a journey of between two and three hundred miles. They were not to reach Gondokoro until February 20th of the following year, a few days after Speke and Grant had arrived. At the head of their column marched a soldier, bearing on a lance a small Union Jack which Mrs. Petherick had made. "The dress I wore was practical: a short thick linsey petticoat, leather gaiters, strong boots, cloth jacket, leather gloves, and straw hat without a veil—that would soon have been torn off; round my waist was buckled a five-barrelled revolver pistol secured in a small pouch. Petherick was heavily armed: "a pair of five-barrelled revolvers at the waist, a double-barrell rifle slung to the saddle, and a five-barrell revolver rifle in hand, quite ready for action."

At last they struggled down the valley of the Luri. "Gondokoro and the boats were visible, but my eyes could hardly discern them, so full of tears were they From this place a beautiful prospect presented itself: the mountain Belinga and a fine range of hills were on the opposite side of the noble river, and Mount Kerack, thickly covered with trees, rose on our right. The negroes, rich in cattle, drove their herds into zeribas (cactus fenced), there to be milked, and afterwards were let out to pasture again. At 3 p.m. Zambae returned, accompanied by several of our people from the boats, which awaited us, not at the ferry, however, but a mile or two lower down the river, and nearly opposite the position we had taken up. From the men we heard that Captains Speke and Grant had arrived but four days previously at Gondokoro. How great was our joy they were safe, and had accomplished their grand mission! Eager to greet them, we pushed on, and in less than an hour were on board our *dahabyeh*, the "Kathleen." We had not seen her since she sailed from Korosko on September 4th, 1861. The servants approached to kiss our hands and offer felicitations, their eyes full of surprise as they looked upon me, and a murmur of 'Miskeen' ('poor thing'!) I heard. I knew not how great was the change in my appearance until I approached a mirror; it was then evident, startling even myself: "A woman clothed in unwomanly rags, skin red-browned, face worn and haggard, hair scorched crisp, and

clad in a scanty dress of gaudy calico, purchased from one of the soldiers ; this was the object reflected. How comfortable and home-like the cabins looked with couches, tables, &c. Luggage of the travellers, Speke and Grant, writing and drawing materials were scattered about, as they had just left the ' Kathleen ' for a stroll, when the summons was received that the ' Kathleen ' was to be despatched to meet us. As we approached Gondokoro, the Catholic Mission house (unfortunately now abandoned) was looked upon with intense interest : it was well situated on an eminence, some fine sycamore trees made picturesque the high pointed straw *tookuls* nestled around them, and a flotilla of boats, with flags of many nations, enlivened the usually deserted bright, glorious river. Arrived at the bank and the *dahabyeh* moored, Captains Speke and Grant, accompanied by Mr. Baker, stepped on board. How much there was to relate, but how far out in their calculations both Captain Speke and Petherick had been as to the date of their probable meeting ! Mr. Baker invited us to dine on board his *dahabyeh*. Speke and Grant were also his guests. Pleasant, indeed, was it to sit once more at a comfortably appointed table, and refreshing was the tea served—so long untasted by us. I had not then the heart to break to Captain Grant the sad tidings we had for him, but the following morning I gave him the letters entrusted by his relatives to our care."

It was not until October the 2nd, after their return to Khartoum, that Mrs. Petherick wrote to tell her sister the whole sad story of her husband's breach with Speke.

"MONA DEAR.—I begin a letter to you, hoping that I may have the strength to write so that you may understand me . . . We are both very ill, but dear Petherick has been well-nigh death . . . Last Saturday, towards sundown, Foxcroft (accompanied by Ibrahim) rushed into the saloon, crying ' Backsheesh.' Thinking he came for the reward promised if my gazelle, which had been missing three days, was brought, I gave the few dollars. Foxcroft, very pale, said, ' I bring you news of a post ; it has arrived, and there is a bag for you.' Sister, dear, I had weeks ago made a vow that when a post for us was brought, even ere the bag was opened, an order should be given to slaughter a bullock for our people. Whilst this was issued, in my trembling hands I held the bag. At last the cloth was cut, when paper after paper fell out for Baker, Baker ! then came letters for Baker, until Petherick said, ' Be

a brave old girl, this is Baker's post : ' but I could not be brave, and fell fainting to the ground.

" They tell me I remained all night unconscious, and when morning broke I was still in my day dress, and noon had long past ere I was made to comprehend that *there were* letters for us—they had covered me with them, trying thus to restore me. The first which I opened was in the fair writing of our mother, and at the top of the page was a golden bit of hair, attached by a thread to the paper, and I knew that my Frances, of whose marriage I received tidings at Gondokoro, was a mother . . . Oh, Mona, what anguish have we caused you.

" It was not until the eve of the second day that all the letters were read, then came the reaction for Petherick : all thought that he was dying ; someone came and cut off his hair, and then they cupped the back of his head . . . Is it possible that Speke can so have acted ? It seems incredible that he should impugn the honour and integrity of Petherick : my heart is filled with bitterness.

" Speke, thus to treat Petherick, must surely appear to the public as most ungrateful conduct—he not to say a word that everything we had was placed at his disposal . . .

" I cannot tell you my feelings : Petherick, so honest and true himself, believes everyone the same, and would not listen to my fears that Speke and Baker wished us not well.

" They dined with us ; and a tremendous ham which we brought out from England was cooked : this we always said was to be done when we met Speke. During dinner, I endeavoured to prevail upon Speke to accept our aid, but he drawlingly replied, ' I do not wish to recognise the succour dodge ' : the rest of our conversation I am not well enough to repeat. I grow heart-sick now, as I did then, after all our toil. Never mind, it will recoil upon him yet, his heartless conduct. I soon left the table and never dined with them again ; I became ill, and did not hold up my head for weeks, though the morning they left I managed to go to their boat to bid them ' God speed,' and to impress upon Speke how obliged I should be if he would, as soon as possible, convey the intelligence of our well-being to our friends at home : how kindly he did so !!! "

The Pethericks spent a year (June, 1863, to June, 1864) in Khartoum : in this unhappy time, for Petherick's trade had proved unsuccessful,

and his Consulship was abolished, friendly, warm-hearted Mrs. Petherick found consolation in the friendship of Miss Tinné, who lived for a time on Tuti Island, and of her relation, Miss Von Capellan, who died in Khartoum. Later, Mrs. Petherick met another interesting figure, Lady Duff Gordon, that brilliant and sympathetic observer of native life on the Lower Nile.

If Mrs. Petherick was a typical Victorian lady, Sir Samuel Baker was a typical Victorian gentleman, with his full share of these foibles that make the age a little ridiculous, and also of those great qualities which give it its claim to be one of the most glorious of our national eras. He joined to his magnificent constitution a soldier's eye for country and a hunter's eye for game, a strict sense of discipline coupled with a talent for genial leadership, solicitude for those under his command, with an absolute determination to have his own way, complete fearlessness, and an unshaken belief in the superiority of his own class and race to that of any other in Europe or in Africa. Such a character was a guarantee of success. The natives found him a splendid leader and champion, while the Nubian traders feared and respected him.

At the same time it was his love of domination that landed him in almost as many difficulties as Emin's habit of daily vacillation, though with less unfortunate results. Thus from the first all who had a stake, and it goes without saying, a dishonest stake, in the fortunes of Central Africa, did their best to delay and hamper his every plan. They opposed him because they saw that he was not a mild and remote naturalist like Schweinfurth, nor a methodical geographer like Junker, but a leader, who, however harmless the projects of discovery that he announced, could not be happy unless he was fighting for a cause, and pitting his strength and will against another's. This cause he found in the suppression of slavery, and though he professed to be only a private traveller in the sixties, the Arab traders of Khartoum and Gondokoro were right in their intuition that he was the kind of man who would look with a quick eye on their doings, if wrong in their assumption that he was a spy. And their fears were fulfilled when he returned in the 70's with the rank of Pasha, and the authority of the Khedive to establish an orderly Government in the Equatorial provinces of his kingdom.

Consequently, even on his first journey, difficulties that never confronted his contemporaries were constantly put in his way. His method

of dealing with a refractory escort was to interview them with a cocked rifle in his hands, "five double-barrelled guns loaded with buckshot, a revolver, and a naked sabre as sharp as a razor" laid on the angerib on which he sat; while behind him stood his servants, also holding double-barrelled guns, and Mrs. Baker to point out any man who made a suspicious movement.

But if he alienated the traders, Baker delighted the natives with his gallant actions. He would pursue a runaway slave on his horse, so as to shield him from the shots of the Turks, who did not dare to fire when they might as easily wound Baker as the slave, return with the man holding his horse's mane, refuse to allow the Turk either to shoot or beat him, and be acclaimed by the porters with shouts of delight, which if he did not understand he rightly grasped meant a salute to his gallantry.

Baker as an author has very much the same qualities as Baker the explorer. He has no art or delicacy of style, but he tells a good story in vigorous language.

Who could resist such an opening as this: "Where shall we go?" said the men, just as the order was given to start. "Who can travel without a guide? No one knows the road." The moon was up, and the mountain of Belignan was distinctly visible about nine miles distant. Knowing that the route lay on the east side of that mountain, I led the way, Mrs. Baker riding by my side, and the British flag following close behind us as a guide for the caravan of heavily-laden camels and donkeys. We shook hands warmly with Dr. Murie, who had come to see us off, and thus we started on our march in Central Africa on the 26th of March, 1863."

Then follows a chapter that must rank high in the literature of exploration. Baker rises to his theme: the romance of the African night, when the moon is high and the villagers are dancing, the difficulties of the road, the trees with thorns like hooks, the rocky khors, the over-laden camels, the apathy of the porters, and his own determination to go on at all costs. Travelling by night, Baker had outstripped the

NOTE.—Baker says: "I was regarded by the Latookas as their friend for having saved their man, and they grinned their approbation in the most unmistakable manner as I rode past their line, shouting, 'Morrté, morrté mattat'! (Welcome, welcome, chief!)" "Albert Nyanza," Vol. I, p. 191. If the porters were Loteoya and not Latutea, as Baker says, the words meant "Great chief, great chief, chief." Morrté (Bari Mor) means paramount chief.

traders' party who, he feared, might raise the Latuka against him should they reach Lyria first. On the second morning of the march, Mrs. Baker and he rode ahead of the caravan through the pass of Tollogo. "The valley of Ellyria was about four hundred feet below, at about a mile distant. Beautiful mountains, some two or three thousand feet high, of grey granite, walled in the narrow vale; while the landscape of forest and plain was bounded at about fifty or sixty miles distance to the east by the blue mountains of Latuka. The mountains of Ellyria was the commencement of the fine range that continued indefinitely to the south. We were now in the very gorge of that chain."

They were sitting by the road congratulating themselves on outstripping the Turk when they heard the approaching sounds of a caravan. "We could distinctly hear the men's voices, and we rejoiced that they were approaching the last remaining obstacle—that one ravine passed through and all before would be easy. I heard the rattling of the stones as they drew nearer, and looking towards the ravine I saw emerge from the dark foliage of the trees within fifty yards of us the hated *red flag and crescent, leading the Turks' party!* We were out-marched."

Baker's next book, "Ismailia," never quite catches the adventurous, care-free spirit of the "Albert Nyanza." Baker was no longer a traveller, but a general, and the indiscipline of his troops and the hostility of the people he had come to help, were enough to dishearten and defeat a lesser man than he was. But even when he had triumphed over both these difficulties he found himself betrayed by the very authorities who sent him, and Abu Saoud, his chief opponent and a big slave trader in the south, whom he had had arrested¹ in Cairo, appointed as assistant to his successor.

While Sir Samuel Baker was struggling to make the position of the Khartoumers impossible in the Southern Sudan, his great contemporary, George Schweinfurth, was placidly living with them in their zeribas, or travelling with them on their expeditions, while he collected the information that enabled him to write his great work, "The Heart of Africa." Schweinfurth was not a partisan, but a naturalist, and he was inclined

¹NOTE.—To effect this Baker, on his return to Khartoum, stopped "at the large tree which is within five miles of Khartoum by the short cut across the neck of land to the Blue Nile." From there he sent a message to the Governor to telegraph to Cairo, before any one learnt of his arrival and could warn Abu Saoud. The large tree mentioned is presumably the one now called Gordon's tree.

to study men as he studied plants. Both, he felt, were the creatures of Nature; he liked to observe how the long-legged Nilotic seemed to evolve—a human stork—in response to his surroundings, how the Bongo and Zande were a coppery red like the tinge of their ferruginous soil, and how native music seemed to echo all the moods and tones of the orchestra of the elements. He was never so happy as when he was spending long days in collecting. “When I had seen all the labours of the kitchen garden complete, I was free to abandon myself to the full delights of the flora. Up with the sun, I used to take one or two of my people with me to carry my portfolios and my arms, and in the safe vicinity of the Seriba I explored the woods for hours together, returning about noon with a whole treasury of floral wealth. My table at meals never failed to be well supplied, and I was treated as bountifully as in Africa I could be. I enjoyed sitting in the shade of some spreading tree, while I proceeded to analyse, to classify, and to register, the various novelties which I was perpetually finding. Later in the day I was in the habit of wandering out alone over the plains, whilst my servants at home busied themselves in renewing the paper for my *hortus siccus*, and in pressing out the plants afresh. This labour of the day was often carried on till quite late at night: it was repeated so often that my collection increased to a very considerable extent; roll was piled upon roll; everything most carefully stitched up in hides ready to go along with me on my farther journey, and to be carried across deserts and seas until they could finally be deposited in the magazines of science.”

Schweinfurth belonged to a type of scientist that is not common to-day. The nineteenth century was the golden age of amateurs, studious men of independent means, who were free to follow a line of study in whatever direction they liked. Junker, and in a sense Emin, belonged to that tradition. They had not specialised on any one department to the exclusion of all others. They were botanists, geographers and ethnologists, and their zoology included the study of animals, birds, and insects. They were all voracious collectors and untiring classifiers, natural philosophers with an insatiable German capacity. Schweinfurth had more instinct for style and proportion than the other two. He never wrote obscurely or dully; he kept his science well in the background, a thing that Emin could never do, and fused the whole of his immense knowledge in a leisurely and easy narrative. Perhaps it was the

destruction of masses of notes at Seriba Ghattas on December 1st, 1870, that forced him to write from recollection. It was certainly that incident that moved him to the most eloquent passage in the book :—

“As the sun sank, we began to make a search for anything that might have been spared amidst the still glowing embers of the huts. I had saved little beyond my life. I had lost all my clothes, my guns, and the best part of my instruments. I was without tea and without quinine. As I stood gazing upon the pile of ashes, I could not help reckoning up the accumulation of my labours which had there, beneath them all, been buried in this hapless destiny. All my preparations for the projected expedition to the Niam-Niam; all the produce of my recent journey; all the entomological collection that I had made with such constant interest; all the examples of native industry which I had procured by so much care; all my registers of meteorological events which had been kept day by day and without interruption ever since my first departure from Suakin, and in which I had inscribed some 7,000 barometrical observations; all my journals, with their detailed narrative of the transactions of 825 days; all my elaborate measurements of the bodies of the natives, which I had been at so much pains and expense to induce them to permit; all my vocabularies which it had been so tedious a business to compile; everything, in the course of a single hour, everything was gone, the plunder of the flames.”

“During the Paris Geographical Congress of August, 1875, I came into personal contact with those three bright German stars of African Exploration, Nachtigal, Rohlf, and Schweinfurth; and by them my attention was directed towards Dar-For, a region at that time presenting geographical interests of the first importance. I accordingly selected as the goal of my future activity this land still shrouded in the veil of an awe-inspiring mystery.”

Thus Dr. Wilhelm Junker opens his “Travels in Africa,” in three volumes. He was Schweinfurth’s successor, and after a period in Dar-For, turned to the exploration of the Nile-Congo divide, where he did the bulk of his work. His book is a trifle dull, partly because much of it is occupied with local topography, which can hardly be interesting unless the reader knows the district well, and partly because he had not the gift for selection Schweinfurth had. Nevertheless, it is a mine of

information, and should be treated as such, and used for reference rather than read for enjoyment.

He gives a rather fuller picture than his contemporaries of the administrative and social background of those days, and the conditions in Khartoum. Khartoum was then a curious patchwork society. Turkish officials, rich merchants who had made their money in the south by methods that nobody enquired into too closely, European consuls and travellers, with a preponderance of Austrians, were all jostling each other in developing and ruling the Sudan, unconscious of the black cloud which was in a few years to blot out all their schemes and envelop the country for fifteen years. The Mahdia gives that period a remoteness that invests its least details with a strange interest. Khartoum was only half Europeanised in those days. At one evening party Junker would be entertained by the strains of Verdi's "Aida," and at another listen to the band playing a Bari song set to music by Consul Hansal. Wealthy pashas, copying the fashions of Europe, would borrow the magnificent dinner-service, which had once belonged to the unfortunate Miss Tinné, and had been left by her to the Roman Catholic Mission.

It is in this society that we catch almost our first glimpse of Emin Pasha. He arrived in Khartoum on the 3rd of December, 1875, and gave himself out to be a Turk educated in Germany. In the mornings he might be seen returning from the suk with his modest household purchases; in the evening he would play chess with Giegler Pasha, or entertain the company by playing Chopin and Mendelssohn on Hansal's piano.

The career of Emin Pasha has a unity that the lives of the other authors of the Sudan lack. Baker's discovery of the Albert Nyanza was only an incident in a distinguished career: Stanley had rescued Livingstone before he rescued Emin. But the whole scene of Emin's rise, career, and fall is set in Central Africa. A lucky appointment brought Emin to Lado as the medical officer of the Equatorial Province: later he was made use of by Gordon as a diplomatic agent, and at last, on the suggestion of Dr. Junker, was appointed by Gordon to be Governor of the Province. It was before Emin became famous, and for the most part while he was at Lado, that he made his lasting contribution to the scientific literature of Africa, and wrote the great series of letters which are his chief monument. As an author, however, Emin is almost

unquotable ; and though we may admire his accuracy, his knowledge, and his persistent curiosity, he is difficult to read. If he had any views about style, he must, like the French author, have taken the Code Napoléon as his model. To cut out every superfluous word, to suppress every personal sentiment, and to describe with fastidious accuracy—this was his ambition. In this, as in most other things, Emin was a complete contrast to Stanley. Stanley is too easy to read ; comparatively ignorant of science he made up for his lack of precise knowledge by thunderous passage of description ; but his eloquence is bombast, and it is refreshing to turn from his profuseness to the frigid accuracy of Emin.

At Lado, too, Emin made his closest friendships. He always liked entertaining guests, and they were invariably impressed by the order and comfort with which he surrounded himself. There was the garden on which he lavished such care, the neat little dispensary for Vita Hassan, and his own room piled with books, instruments, and specimens. He went about his work conscientiously and methodically, attending the sick every morning, sitting cross-legged in the divan hearing cases and reading correspondence, and in the afternoon retiring to the delight of scientific work. In the evening he might meet his subordinates for coffee and conversation, or Junker might bring out a few carefully-cherished cigars, and they would discuss the situation interminably—Lupton's fate in the Bahr-el-Ghazal, their own chances, and the possible arrival of the steamer that never came.

Emin's little oasis of civilization was soon invaded by movement that had overwhelmed Khartoum and the north. He held his own, drew in his outposts, organised a defence, and stirred the admiration of the people at home. It was decided to relieve or to rescue him. A plan that at first aimed at the personal assistance of Emin quite naturally grew in scope, and other objects and motives crept in. It is fair to suppose that the East African Trading Company hoped for some advantage by rescuing a man who talked about "Sarawaking" his province. At any rate, from the moment that his rescuer appeared on the shores of Lake Albert began that series of disappointments and recriminations, both personal and national, that were only to subside when Emin made his final exit into the depths of the Ituri forest.

The relief of Emin Pasha is a sad and confused story, and the difficulties of communication—the long delays, the journeys to and from

the Lake, the plans put forward and abandoned—all complicate it. But certain points emerge clearly enough. The rescuers did not find what they expected to find. Equatoria was not a model province administered by an efficient governor; instead it was rotten with intrigue and disaffection. The 1st Battalion was in revolt, and the nominally loyal 2nd only obeyed Emin in so far as they wanted to. And Emin was not frank about this state of affairs. It is clear, too, that Emin was infinitely below Stanley as a leader of men, and that Stanley found him impossible to deal with. The truth was that Emin did not know what he wanted, and in any case disliked making up his mind. He only knew that Equatoria gave him the work he liked, that he did not really wish to leave it, and that behind the admirable sentiment of loyalty to his friends and subordinates, and the determination never to desert them, he sheltered himself from the hateful necessity of making a decision.

In this situation Emin was no match for Stanley. His precarious authority so clearly did not exist, the slight duplicities and indirect methods that seemed to serve well enough with Soudanese and Egyptians were so out of place; the grave and courtly manner, the punctilious correctitude, the solicitude for science and civilisation, the devotion to duty—in a word all those elaborate defences of the essential weakness of Emin's character crumbled away before the ruthless Stanley. In this uncongenial atmosphere Emin grew more and more unhappy. At first he had thought to hold his own. He had been flattered by offers of an appointment under the East African Company, and had written with pride in his journal that it was the most memorable day of his life. But he soon found a different level; under the stress of criticism which once or twice broke out into painful conflict, he retired into silent reserve and the hobby of his life-time, where at least he was an acknowledged expert. But even here he found himself derided as a scientist, of whom Stanley said, with a very unscientific contempt, that even "vermin" did not come amiss to him. At last Emin gave up the unequal struggle and begged to be left behind when the expedition should reach the house of his friend Mackay, the missionary. Yet there was to be one more unforeseen and dramatic turn in his career; one might almost say, so appositely did the event happen, that Emin still had one more shot in his locker. On the very night of the public dinner in Zanzibar, at the height of the congratulations and complimentary speeches which covered this

personal drama of bitter conflict, a most extraordinary accident took Emin beyond the reach of his rescuer. He fell out of an open window into the street below. He lay closely isolated in hospital, watched over by German friends, while Stanley and his servants were refused or repulsed. In these circumstances Emin had a strange revulsion of feeling in favour of what he had for so many years foregone—home ties and national sentiments. Perhaps he saw a chance of escape away from the domination of Stanley, away from employment, back to research and collecting, back to the life he knew and loved, and the only one he was fit for. Perhaps he burnt to distinguish himself, to wipe out the silent taunts that he had felt aimed at him, to prove to Stanley that he was not the "vain and spoiled child" that he had called him. Perhaps, too, he thought in this way to turn the tables on Stanley; if Stanley had wanted him as a trophy in his triumph, or to use him as a pawn in some political game, he should be disappointed.

Jephson gives another version of this decisive moment :

"On the morning of December 28th I went over to Bagamoyo and remained with Emin till the next day. He seemed delighted to see me, asked why we had not been over oftener to see him, for he said : 'You know, though the Germans are my countrymen, I can never think of them in the same friendly way as I think of you, of the Expedition who have rescued me, and who have been through such dangers and difficulties with me.'

"I told him that several times we had proposed to come over to see him, but that we were either told by the doctors that he had had a relapse, and that it was inadvisable to see him, or that there were no German steamers available. He seemed to be extremely angry when he heard this . . .

"I sat long with Emin that day and talked with him. I told him that Parke had said that if he could be carried on board the mail steamer, and accompany us, he would be well before we got to Suez. Emin shook his head and sadly replied : 'I know it, and I wish I could go with you, but I cannot.' It was no use urging him after that ; but we sat and talked of the experiences we had passed through together, of his future, and that of the little Farida. Emin seemed overcome by a profound melancholy ; he complained of the noisy position of the hospital, surrounded

as it was by native shops, and several other things which annoyed him; he repeated how he wished he was going with us, but again said that he could not . . .

"In parting, he held my hand in both his, and told me how deeply grateful he was for what we had done for him. He said: 'You I shall never forget, for you have been my companion and friend through these months of our imprisonment together—those months which were the worst months of my life.'

"It seemed as if he was taking a long good-bye, and, profoundly touched by the inexpressible sadness of his tone, I once more urged him to come with us. Again he shook his head and said it was impossible, so I sadly bade him good-bye and returned to Zanzibar.

"From Zanzibar, Aden and Egypt I have written to him, but from that day to this I have had no word from him."

Jephson surmises that "a will stronger than his own must have compelled him to act against his better nature," the will presumably of the German Commissioner, Major von Wissman. However that may be, Emin threw over the offers of employment made by the East African Trading Company, accepted the German offer, and headed an expedition of a semi-political nature into the region of Lakes Tanganyika and Nyanza. He, who was by temperament so cold to the ideals and ambitions of aggressive nationalism, became its agent. For a time he had the warm glow of sharing the emotions of his fellow-countrymen. He was made a member of his old club, entered into correspondence with old friends, ordered fifty German flags, contracted treaties and established stations. But the mood was a phase. He was an impracticable diplomatist, and disregarded the instructions of his superiors. The Anglo-German Convention of 1890 should have curtailed his activities; but he pushed further into the interior. He fell back into his old habits; for a time he seemed happy as he wandered about the banks of the Victoria Nyanza collecting and recording as he used to do in the old days at Lado. But disaster fell upon his expedition; his companion Stuhlmann fell ill, small-pox attacked his men, food and porters grew difficult to find. Emin was ill, half-blind, and unbalanced. He struggled on, mechanically repeating the old habitual formula of his being. He was murdered on October 23rd, 1892, probably at the instigation of Arab traders, whom

he had punished. The last entry in his journal were the words : "the barometer is rising rapidly."

The two books of Casati and Jephson : "Ten Years in Equatoria" and "Emin Pasha: the Rebellion on the Equator," are little more than appendices to the story of Emin's career. Beyond the light that they throw on that tangled affair, they have but little interest. Casati is a rhetorical and sketchy writer ; while Jephson tells a plain, straightforward tale, but he was hampered by his ignorance of Arabic or of Bari from understanding all that was going on around him.

No account of the authors of the Sudan would be complete without an attempt to sum up the impressions that they formed of the inhabitants of the country. Their views, as is to be expected, were dictated by the prevalent notions of their own time, their own prejudices of race and class, and their own individual temper. It was natural that the century that saw the amazing expansion of Europe all over the world, should not bother to define what it meant by the civilisation which it was carrying to every continent. The "civilisation" which all these authors, including even the sceptical Emin, talked of, was accepted as something absolutely superior to any other form of society, and the application of it to Africa was assumed by some to be an unquestionable benefit. It is interesting to notice the difference of opinion between the 18th and 19th centuries on this point. When Captain Cook brought back the Tahitan, Omai, in the 1770's, English society delighted in seeing in him all sorts of proofs of the natural superiority of the untutored savage to themselves. The 19th century had no time for such fanciful notions. Baker's index headings under the word "Savages" is characteristic.

Savages hold to their cows and their women ; on a level with the brute ; all are ungrateful, thievish, idle, selfish and cruel ; can only be ruled by force or humbug ; believe in sorcery ; practical magic is all that is esteemed by them ; the gourd the model of their pottery.

Even with friendly natives, Baker never seemed to get out of the habit of regarding them as amusing and rather grotesque children. He always treated Kadiba, the revered head of the Acholi tribe, in this way, and was surprised when his musical entertainment did not prove as absurd as he expected it to be. Native customs which would now raise the delighted curiosity of an anthropologist received little sympathetic

investigation from him, as for example, when he condemns "the absurd custom of public night nurseries" among the Acholi as responsible for the high mortality of their children.

Emin and Schweinfurth's judgments have the merit of a greater degree of detachment. They had less difficulty in forming coherent general opinions, because their personal feelings were seldom very warm. They approached the study of the native in a cool, analytical fashion, and had the patience and imagination to master an outlook that was quite foreign to theirs. Stanley disliked this rather tepid attitude, and there is a passage in his book which well illustrates the difference of temper between himself and the scientists. "I have been attempting to discover the reasons why we two, he (Emin) and I, differ in our judgments of his men. We have some dwarfs in the camp. The Pasha wished to measure their skulls; I devoted my observations to their inner nature. He proceeded to fold his tape round the circumference of the chest; I wished to study the face. The Pasha wondered at the feel of the body; I marvelled at the quick play of the feelings as revealed in the lightning movements of the facial muscles. The Pasha admired the breadth of the frontal bone; I studied the tones of the voice and watched how beautifully a slight flash of the eye coincided with the slightest twitch of a lip. The Pasha might know to a grain what the body of the pigmy weighed, but I only cared to know what the inner capacity was. And this is the reason the Pasha and I differ about the characters of his men. He knows their names, their families, their tribes, their customs; and little as I have been with them, I think I know their natures."

Stanley's remarks put the case in a nutshell. Both he and Emin claimed to "understand the native"; but "understanding the native," a faculty which, like a sense of humour, most people claim to possess, as well as to deny in others, can mean entirely different things. There is intuition which saves the trouble of enquiry, and intellectual comprehension which knows of no other methods than those of enquiry and observation. The one inclines to judge the native by criterions that he does not share, and the other to forget that the black man has any criterions at all in common with the white. Both are impatient of the other, and both, fortunately for literature and controversy, will continue to exist.

The two methods are not, of course, mutually exclusive, but they serve to characterise most of the authors who have written on the natives of the Southern Sudan. Mrs. Petherick, Baker and Stanley may be placed among the "intuitionists"; Schweinfurth, Emin and Junker among the students. But whenever they got to know a native well, they all behaved in very much the same way. Schweinfurth, though he boiled the heads of dead Monbuttu to obtain their skulls, felt the death of his little pigmy—Tikkitikki—so acutely that he lost all energy and could hardly walk for half-an-hour; and Baker, despite his harsh words about the native in general, was attached to, and loved by, many of them, and with Mrs. Baker devotedly tended their boy—Saat—when he too died on the voyage back to Khartoum.

AN EXPLORATION IN THE SOUTH LIBYAN DESERT.

By D. Newbold and W. B. K. Shaw.

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INTRODUCTION.

THE following is a narrative of a journey made by Mr. W. B. K. Shaw and myself in the winter of 1927 into the South Libyan Desert. That portion of the Libyan Desert which lies in Sudan territory west of the Nile in Dongola and Halfa Provinces, between Lat. 16° and Lat. 22°, covers nearly 180,000 square miles. It is, therefore, equal in size to Germany. Until a few years ago this vast desert was, apart from a few journeys on its eastern and southern fringe, almost totally unexplored. It was far less known than the Sahara. In the last five years a number of expeditions by Egyptians (Prince Kemal el Din and Ahmed Bey Hasanein), Frenchmen (M. Bruneau de Laborie and others) and Englishmen (mainly Sudan Government officials) have laid a network of surveyed routes over the face of the desert. But north of Bir Natrun and immediately west of the great Arbain Road, the country has remained almost a complete blank.

In 1923 I made a journey from El Obeid to Bir Natrun and back, discovering on the way the long hill-feature of Jebel Tageru with its

rock-wells and petroglyphs and other antiquities. Prior to this Bir Natrun had not been visited for 15 years. From the top of Jebel Kashafa, the sentinel cone in the middle of the Natrun Oasis, I had gazed at the unknown wastes to the north and north-west, in which, I knew, lay the Oasis of Nukheila with its many date-palms and its salt lake. No European had then set eyes on it, but the hardy Guraan raiders had made it famous by using it as a stepping-stone on their sudden dashes from their mountain fastnesses in French Equatorial Africa on to the fat pastures of the Wadi Gab in Dongola to "lift" camels and perhaps a prisoner or two. But my instructions forbade me to go north of Bir Natrun, and I had to content myself with securing information and native traditions, in the hopes that Fate would grant me another chance.

In April, 1926, Shaw and I conceived the idea of an expedition to penetrate, not only to Nukheila, but 150 miles beyond to the legendary Oasis of Zerzura, which had been reported from a number of sources for over a century as lying in the heart of the unexplored area. Hassanein's discovery of Owenat and Arkeni had shown that there were still hills and water-sources awaiting discovery, and it was quite possible that more than one oasis was concealed between Selima and Nukheila.

In the summer of the same year we learnt, to our disappointment, that Prince Kemal el Din Hussein and Dr. John Ball had reached Nukheila from the west early in 1925 in a column of Citroen cars, and had returned north-westward to Egypt via Owenat. Their journey crossed a vast area previously unknown, but there were still large virgin tracts of desert north and north-east of Nukheila. Moreover, they had not fully explored the Nukheila depression, nor had they found Zerzura.

So we planned to follow my old route to Bir Natrun, to go thence to Nukheila, over an untraversed stretch of 75 miles and then, after a full examination and survey of that oasis, to strike out N.N.E. and then N.E. in a wide curve to Selima, a march of 280 miles without, as far as we knew, water or grass, and lying across a desert untrodden either by Arab or European.

It was not till the autumn of 1927 that our plans matured and we were ready to start with Government permission. The hiring of guides and camels; the selection of adequate surveying instruments and practice

therein; the careful calculation of water and food for ourselves, our Arabs, and the camels; the preparations for collection of grasses and geological specimens—all these labours were rendered far less arduous than they might have been by the generous co-operation and advice of a number of our friends in the Sudan Government. Space forbids a list of names. We are indebted to all for the success of our journey, but especially to Lieut.-Col. S. L. Milligan, C.M.G., D.S.O., Director of Surveys, for the infinite pains which he took, not only over our survey equipment and in answering our queries before we went, but also in preparing our maps and resolving my observational errors on our return; to Mr. H. Maclean Watt, District Commissioner, Dar el Kababish, for his efforts in hiring our camels and escort, and in seeing us off from Soderi; and to Dr. John Ball, Director of Desert Surveys, Cairo, for much invaluable advice. Dr. Ball has spent 30 arduous years over the geology and cartography of the Libyan Desert, and made his first exploration there when I was three years old. His vast experience, gained not only in the Survey Office, but also in covering many thousands of miles by car and camel at all seasons of the year, is unrivalled and its benefit to us incalculable.

It has been said that the most successful exploration is that which has no adventures. If we had no adventures, it was partly due to good fortune, but mainly to the assistance of those friends who enabled us to start off—men, animals and equipment—in good condition. A few lame camels, a leaky fantass, an inaccurate compass, a sick man, may all precipitate disaster. But at hardly any moment of our journey did we feel any real anxiety about our safety.

We also owe a debt to our Arab companions, who followed us without murmuring far out of their known range of desert, and to the camels, which showed unsuspected powers of endurance of cold, hunger and thirst. We were glad to bring them all safely to the banks of the Nile without casualty.

We must apologise for the bald and jerky nature of the following narrative, and of those appendices, for which we are responsible. They were written originally as an official report at intervals snatched from work and during the distractions of leave. We should have liked to re-write them in more pleasing style before publication in this Journal, but found ourselves unequal to the task. We can only leave it to those,

who have passed many desert nights and days, to fill in with their imagination the colours of our monochrome picture.

Scenes and incidents on the march, which loomed so largely at the time, fade at the journey's end only too quickly from memory's inward eye. But a few impressions will always remain.

The first glimmer of the desert dawn comes softly out of the mirk like a ghost, and suddenly the camelman's shadow is seen as a grey smear upon the ribbed sand. Ahead, the guides couch their camels and bend their chilled limbs to the East for the day's first prayer. With slow shuffle the caravan crawls up and passes on unhalting. Straightway the scarlet shafts of sunrise lengthen and reveal an empty world. The cold air rising from the ground blows across the front like a film of vapour. Then, all at once, the great ball of the sun is overhead, beating down every shadow and colour into one flat glare of dun sand and pallid sky. The distant rim between earth and heaven is blurred by mirage, until heads swim and eyes mutiny. Then noon, and the long, pitiless afternoon, when the whole universe seems to stand still, save only that the vast ring of the horizon moves always—before, beside and behind—as though to pin the plodding caravan for ever to the very centre of its naked disc. Slowly our shadows lengthen till we are giants of some other age. The laggard sun slips suddenly under the world's edge with a rush of colour dying as soon as born. Then at last the swiftly-ebbing twilight ushers in—first singly, but soon in clusters—the whole white flood of stars. The wind drops, and presently a friendly moon rides serenely over the dying fires of the sleeping camp.

This glory and this horror of sand and sky is found in the pages of Doughty and Kinglake, Lawrence and Hassanein. But, even there, it cannot be wholly recaptured. We can only say with Hassanein: "The Desert is terrible and it is merciless, but to the Desert all those who once have known it must return."

D. N.

NARRATIVE ROUTE REPORT—EL OBEID TO HALFA.

SECTIONS.	INTERMEDIATE MILEAGE.
1. El Obeid to Soderi	120
2. Soderi to Hamra El Sheikh	78
3. Hamra to Bir Natrun (Milani Well)	269
4. The Oasis of Bir Natrun (traverse between Wells) ...	8
5. Bir Natrun (Atrun Well) to Nukheila (Lake Camp) ...	65
6. The Oasis of Nukheila (or Merga, or Tura el Bedai) (traverse between Wells)	21
7. Nukheila (Wadi Hussein Well) to Selima	275
8. The Oasis of Selima	—
9. Selima to Sakiet el Abd (Nile Valley)	76
10. Sakiet el Abd to Wadi Halfa	103
TOTAL... ..	<u>1,015</u>

(Map references are to 1/250,000 sheets, but Sections 6 and 7 traversed country for which sheets on this scale have not yet been printed.)

SECTION 1—EL OBEID TO SODERI—direct via Gleit and Mazrub : 120 miles. (Sheets 55-I, 54 L and 54 G.)

Dep. El Obeid 28.10.1927, p.m. Arr. Soderi 1.11.1927, p.m. : nine *shidds* (half-day marches). This stretch of country is too well known to need description. The latitude of Soderi was fixed by astronomical observations as $2\frac{1}{2}$ miles North of its mapped position. Otherwise no mapping done.

At Soderi the Howawir camels and guides were picked up and final preparations made as this was the last source of supplies or equipment before reaching the Nile, nearly two months ahead.

SECTION 2—SODERI TO HAMRA EL SHEIKH, the headquarters of Sheikh Sir Ali Wad el Tom, K.C.V.O., etc., Nazir Umum of the Kababish tribe. 78 miles. (Sheets 54 H and 54 G.)

Dep. Soderi 4.11.1927, p.m. Arr. Hamra 7.11.1927, a.m., six *shidds*.

Our caravan was now composed as under :—

	MEN.	CAMELS.
D. Newbold and W. B. K. Shaw	2	2
Two Native Servants	2	2
Three Soderi Dist. Police	3	3
Guides and Escort	10	10
Baggage Party	11	20
	<u>28</u>	<u>37</u>
		(Later increased to 40.)

We had thus 15 riding and 22 baggage camels, carrying stores, water, grain, etc. (For details, *see* Appendix IX.) We carried 17 rifles, all told, and nearly 800 rounds of ammunition.

This section is also well-known country and most of it has been included in the Khartoum-Fasher triangulation. It runs westward across the Wadi El Melik, over rolling park-like country covered with grass and low trees, and dotted with conspicuous hills.

We stayed at Hamra 1½ days, enjoying the generous hospitality of Sir Ali el Tom, which included the gift of a fat *naga* (she-camel) to the Hawawir. Foreseeing a probable shortage of supplies in the northern deserts, they were wise enough not to slaughter it on the spot, but drove it with the caravan as far as Nukheila.

The latitude of our camp at Hamra was fixed carefully by theodolite, and the longitude approximately by plotting, since our mapping began from this point.

SECTION 3—HAMRA TO BIR NATRUN (Milani well) 269 miles. (Sheets 54 G, 54 C, 44 O, 44 K, 44 J, 44 F.)

Dep. Hamra 8. II. 1927, p.m. Arr. Bir Natrun 20. II. 1927, a.m.

The first stage of this long stretch was to Um Eidam pool, 29 miles from Hamra, and reached in two *shidds*. It was found to have a South error of some four miles on the map. This pool lies in a depression full of *sunt* trees, and there was still a shallow lake which seemed likely to last till early December. We left on the morning of 10. II. 1927, intending to water our camels and fill up *fantasses* (iron water-tanks) at Abu Sofian wells, some 45 miles to the North, for the long waterless stretch thence to Bir Natrun. We had been informed both at Soderi and Um Eidam by Kababish Arabs that the Abu Sofian wells were open and holding water.

To confirm these reports we sent two scouts ahead and followed them more slowly.

On the afternoon of 10.11.1927, having passed Adha el Sobeina, a pool similar to Um Eidam, but now dry, we met the scouts returning with the bad news that Abu Sofian well was dry, and also Id el Aja, a little to the North, noted by Bimbashi Evans in 1925. This was a blow, as we had had definite information at Soderi that the rock-wells of Jebel Tageru, half-way to Bir Natrun, were dry; it therefore meant that there was no water between Um Eidam pool, itself now resembling liquid mud, and Bir Natrun, a distance of 240 miles. We had to face an added difficulty in that, in spite of the excellent rains in the rest of Kordofan, the *gizzu* grazing lying on our route had entirely failed. We had not expected this combined bad luck at the outset of the expedition.

We had, however, no alternative but to halt and unload at this camp (Long. $27^{\circ} 51'$, Lat. $15^{\circ} 16'$) and send all the camels, fantasses and water-skins back to Um Eidam for watering. These returned on the morning of 12.11.27, and on the same afternoon we set out for Bir Natrun.

From this point onwards we walked our own camels with the *hamla* (baggage train), having trotted separately hitherto. After 50 miles our route lay up the East side of Jebel Tageru till about the 120th mile. We soon passed out of country which was wooded to any appreciable extent; after the Wadi Nueiga (Lat. $15^{\circ} 21'$) it was much more open and the trees confined to *wadis* and *khors*. Just North of Zolat el Gamal (Lat. $15^{\circ} 42'$) we reached a ridge from which there was a fine view across a great plain to the South-eastern slopes of Jebel Tageru, the Northern corner of the Heitan, and the double cone of Jebel Abu Atshan.

The following day (14.11.1927) we made our noon camp in Wadi Abu Atshan, where there was excellent grazing of *seyal*, *tundub* and *merakh* trees and *tomam* grass, the last real grazing enjoyed before Wadi Hawa, four days ahead.

The intervening country was, owing to the failure of the *gizzu* rains, only relieved from being sheer desert by an occasional patch of dry *nissa* grass. The going, however, was good over the firm surface of the vast sandy plain, which stretches far to the East of Jebel Tageru, and was first crossed by Bimbashi Coningham and other officers of the Camel Corps in 1907 and 1908.

On the morning of 17.11.1927, after six monotonous *shidds* over this dreary desert, we reached Ras Tageru, the Northern apex of that 80-mile-long sandstone hill, in Lat. $17^{\circ} 02'$. During these three days we had passed many ostrich and addax tracks, and at our camp 12 Lat. $16^{\circ} 30'$ saw a herd of 10 addax. At this remote spot a Kabbashi of the Atawia section had pitched his tent to hunt the addax and oryx, with a comrade, whom we met, riding backwards and forwards to Um Eidam for water.

At Ras Tageru, where we found a good patch of green *hād* grass, we gave each of the camels a bucketful of water (2 gallons) as it was now clear we had more than enough to take us to Bir Natrun. From this camp Jebel Rahib is visible.

On the morning of 18.11.1927 we reached the Wadi Hawa with its good grazing of *shau* bushes and *hād* and *agūl* grasses, and camped near a high *goz* (sand dune) in a clump of *seyal* trees.

On leaving the Wadi Hawa that afternoon we visited the ancient sites discovered by Newbold in 1923, and collected more of the green stone axeheads, pottery, animal bones and pestles. These sites would probably repay excavation (see Appendix VII).

Two more *shidds* over barren desert, with the confused mass of Jebel Rahib on our right, brought us to Zolat El Hammad. The last *shidd* was 20 miles in the teeth of a sand-blizzard and took the caravan eight hours. We camped in the little Wadi of Wa'ar el Gilud which has good grazing of *sellim* and other trees, and inspected and photographed the fine group of rock-pictures discovered by the Howawir in 1917, and recorded in *Sudan Notes and Records*, Volume VII., No. 1, by Newbold.

We arrived at Milani well, the Southernmost spring of the Natrun Oasis, on the morning of 20.11.1927. In spite of the meagre grazing on the route, and their nine days' abstinence from a proper watering, and the high temperatures encountered up till now, the camels arrived in good condition.

The men were also contented, having had an almost continual supply of game, which they had been told off to hunt both at camps and on the march whenever opportunity occurred. This was chiefly the ordinary Dorcas gazelle, but included some addra and an addax.

They also shot a female cheetah with two baby cubs, which died in spite of our efforts to rear them and bring them along.



THE POOL AT UM EIDAM.



VIEW FROM RIDGE NEAR ZOLAT EL GENAL.



ROCK PICTURES AT ZOLAT EL HAMMAD.



ROCK PICTURES AT ZOLAT EL HAMMAD.



APPROACHING ZOLAT EL HAMMAD.



OLD CAMEL CORPS' SANGAR ON JEBEL KASHAFA, BIR NATRUN.

SECTION 4. THE OASIS OF BIR NATRUN. (Map reference Sheet 44 F, revised to November 25th).

We stayed at the Natrun Oasis five days. The Oasis has been described by Bimbashi Hodgson (v. Gleichen's "Anglo-Egyptian Sudan," Vol. I, Ch. 9) and Newbold (*S. N. & R.*, Vol. VII., No. 1, pp. 68—73), but as no detailed notes on its vegetation or geology have been made, a fuller description on these points is included in Appendices IV and V.

We found a number of Kababish Arabs at the Oasis collecting rock-salt. One party was of the Atawia section of Sir Ali Tom's Kababish, and another, with a caravan of 160 camels, were Um Metto Kababish from Dongola. There were also a few Zeyadia and Um Gelul from Northern Darfur. Altogether there were probably about 300 camels in the Oasis. The price of the rock-salt (*'atrūn*) in Dongola was said to be 50—60 pt. a *kantar* (100 lbs.). The camels carry loads of about 4 *kantars* packed in strong palm-leaf baskets.

By a stroke of luck the Um Metto caravan included a well-known guide, Hamatulla Mohammed Omar, about whom we had been previously in correspondence with the Dongola authorities. He has almost certainly an unrivalled knowledge of the Halfa and Dongola deserts, having accompanied most of the expeditions made in this area since the re-occupation of the Sudan, including those of Bimbashia Hodgson (1903, Selima-Lagia-Bir Natrun), Comyn (1906, Terfawi Shebb and Selima), Coningham (1908, Bir Natrun and desert East of it), Prince Yusef Kemal (1923, Jebel Rahib), etc., and having also taken part in an Um Metto raid into Dar Guraan, in French territory, not many years ago, via Lagia and Nukheila.

We agreed with him and a companion of his that they should join our caravan as far as Halfa, if necessary. The inclusion of these two Um Metto in our party put the Howawir in an interesting dilemma. Relations between the two tribes were at this moment rather strained owing to a feud over a boundary well, and from time immemorial the Howawir have affected to despise the Um Metto as weaklings, and call their country "*dar mara*" (women's land). Consequently they did not relish having to follow an Um Metto guide beyond Nukheila, which was the Northern limit of their own guides.

On the other hand, although they professed the utmost confidence in the *mizania* (theodolite), it was obvious they were apprehensive at

trusting to its magic in the ten days' journey over unknown desert between Nukheila and Selima.

They knew that Hamatulla would probably be able to recognize either Selima or Lagia when we were within a day's march and therefore conquered their hereditary dislike for his tribe. It was noticeable that throughout the journey the two Um Metto invariably camped by themselves.

During the days we spent at Bir Milani we rode round the Oasis, visiting the salt-pans and the other wells and also the derelict Camel Corps' camp on the Western shoulder of Jebel Kashafa. There still remain odd relics of the ill-fated detachment which was stationed here in 1907 and lost its way on the return journey to Dongola, so that a number of men died of thirst in the desert. Hamatulla, the guide, was one of the party sent later to recover the ammunition buried by the detachment before it left.

We took careful astronomical observations for latitude at Milani and found it to be correct on the map, but it appeared from later plotting to Nukheila that its longitude and that of the whole Natrun Oasis may be three miles in error (see Appendix I). From Bir Milani onwards we used the Survey wheel for checking distances, the road to Bir Natrun from the South having been wheeled in 1923 by Newbold.

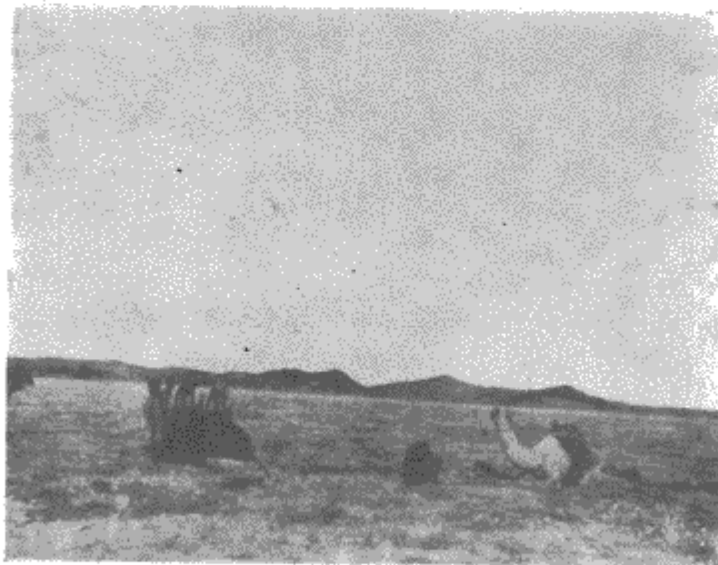
Barometric readings for height had been taken continuously since El Obeid on two aneroid barometers, and thermometric readings (daily maximum and minimum temperature) since Soderi. The collection of botanical specimens had begun about 30 miles North of Hamra and of geological specimens another 30 miles on, and in the same place (about Lat. $15^{\circ} 20'$) daily notes on the direction and force of the wind. Photographs of landscape, antiquities, and objects of interest were also now being taken.

On the evening of 24.11.1927, we shifted camp from Milani to Bir Natrun, at the North end of the Oasis, preparatory to our journey to Nukheila. The camels had been watered at Milani on the day of our arrival and were quite fit after four days' rest and good grazing.

SECTION 5—BIR NATRUN TO NUKHEILA (LAKE CAMP). (Map reference:—Sheet 44 F (as Section 4): Nukheila is just off this sheet): 65 miles (five *shidds*).



BAGS OF ROCKSALT AT BIR NATRUN.



SALT PAN AT BIR NATRUN.

Dep. Natrun Well 25.11.1927, a.m. Arr. Nukheila Lake 27.11.1927, a.m.

At 4.15 a.m. on 25.11.1927, we started out towards Nukheila over country hitherto untraversed by any European. We were now entering a true "no man's land," where the shadow of Governments hardly falls, and where, when a party of Arabs espy strange camelmen on the horizon, they shoot first and enquire afterwards.

Bir Natrun is now comparatively safe, though it has witnessed much bloodshed in the past between raiders and caravans; but the country to the North and North-west is real "terra ignota," and it was quite on the cards that we should meet a party of Guraan brigands either hurrying to or from a raid on to the herds of the Wadi Gab near the Nile, West of Dongola. Consequently we kept a good look-out to front and flanks, had scouts out, and kept sentries on at nights. We were now 19 riflemen, and it was unlikely that we should encounter an armed party too big for us to deal with, but even a small fusillade might wound a number of camels, in these deserts where there is no cover, and the loss of half a dozen camels would have proved fatal to the expedition.

We met no one, however, but saw old tracks in two places.

About half of the Howawir with us had been to Nukheila ten years ago along this route, and a number had been in the 1916 raid made by them into Dar Guraan across the French border. They looked a tough set of ruffians as they rode out ahead and on the flanks with rifles slung over their saddles. Most of the guides were men of over middle age, hard and grizzled. The most noteworthy were Salem Orangel, who had an eye shot out by the Dervishes over 30 years back, and two other wounds, and has since fought the Guraan more than once; Hussein Mattar, a quiet, pleasant-mannered old man with a gentle face, who was always cursing his camel with strange oaths, and who was later to re-discover for us a small oasis to the North of Nukheila, which he had found in 1916, when the Government had a post of 160 men of the Howawir tribe stationed there to hinder any co-operation between Sultan Ali Dinar, then still unconquered, and the Senussi in Kufra; Matar, the nephew of Hussein, always cheerful with the resilience of youth, whatever the difficulties of cold or hunger; and, last, Sheikh Mohammed Hassan Khalifa, the head of the caravan, and second son of Sheikh Hassan Khalifa Nazir of the Howawir, a large man with an almost

incredible paunch, having a varied experience of the Western Desert and good authority over his men, in spite of an unpleasant manner.

There is little to describe in the 70 odd miles of country between Bir Natrun and Nukheila. After the first few miles vegetation, save for, perhaps, a dozen *tundub* trees, dies out. There are no hills or *wadis* of any size, and practically no game. It is an ugly, barren desert, with low confused sandstone ridges. The undulations provide wide views to front and flanks periodically. The surface varies from stony outcrops to pebbles and gravel, alternating with patches of bare sand. The going is fair throughout.

On leaving the Oasis, we crossed a salt-pan and then wound up over a dune belt for nearly two miles on to a stony desert with sandy patches, leaving on our right a long broken range of sandstone hills. We passed over a succession of stony ridges, still ascending, and made our first noon camp 16 miles from Bir Natrun, on a desolate ridge, near a solitary *tundub*, where there were a few dozen tufts of dry grass. The same afternoon we did 9½ miles over very undulating desert with many sandstone outcrops and no grass, and camped near three isolated *tundubs* which our 40 camels completely devoured.

Next day (26.II.1927) we covered 26 miles between 4.30 a.m. and 4.10 p.m., halting from 7 a.m. to 10 a.m. to take advantage of a fair patch of grass scattered over a low ridge—*hād*, *nissa*, and *agul*. After this halt the surface grew less stony, and we crossed a wide depression on to a bare, almost flat, desert, of fine gravel and sand, devoid of vegetation. We camped this evening on a prominent long low hill, from the top of which the Nukheila depression was clearly visible 15 miles due North; the actual oasis and palm groves are hidden by the southern dune-belt, but one or two palm tops could be seen through the theodolite telescope, and a white conical hill, which we later found to be 3½ miles North-west of the lake, stood out boldly. We named the hill on which we stood Jebel El Naddāra, or observation hill, and the Howawir now know it as such.

On the morning of 27.II.1927, we left camp at 4.45; the guides bore too much to the East in the dark, not being sure, after 10 years absence, of the entry through the dunes. The dunes, in fact, offer no obstacle. After crossing a flat sandy plain we came on to a broken plateau where we had our first view of the palm-groves, and at about

8 a.m. entered the Nukheila depression. We had sent on five scouts ahead to find out if the Oasis was tenanted, and moved continuously along their tracks until it was clear that no one was there. It took us two hours to reach the lake from the lip of the depression, winding among sand-dunes and crossing two basins full of green *hād* and *ekhlis* grass. At 9.30 we came out on to the floor of the depression and bent to the North-east; two miles more brought us to where the lake lies amid scattered palms. On the way we saw the many tracks made by the Citroen cars of Prince Kemal El Din's expedition of 1925.

We pitched our camp thankfully about 200 yards North-west of the lake. We were the first Englishmen after Dr. Ball to visit this Oasis, which has long been known from Arab information only.

SECTION 6.—NUKHEILA OASIS. (No. 1/250,000 map is printed, but see Survey of Egypt 1/500,000 map of Prince Kemal El Din's Expedition.)

The Oasis of Nukheila, which covers about 50 square miles, lies in Long. $26^{\circ} 18'$, Lat. $19^{\circ} 02'$. Its position was fixed by Dr. John Ball, Director of the Desert Surveys of Egypt, who accompanied Prince Kemal El Din Hussein from Erdi to Nukheila and from Nukheila to Owenat in February, 1925. It was this Motor Expedition which first "discovered" Nukheila.

The Oasis had, however, been known previously from native information both in Egypt and the Sudan, and also in Cyrenaica and French Wadai. Its name in Egypt and Cyrenaica is Merga. In the Sudan it is known as Nukheila to the Kababish and Howawir, and as Tura el Bedai (the Oasis of the Bedayat) to the people of Northern Darfur. It is also sometimes called Tamar El Qusar, but this name properly refers to a small outlying oasis to the North-east.

The Bibliography of Nukheila is naturally scanty. It was mentioned by Mr. Harding King in his article, "The Libyan Desert from Native Information" ("Geogr. Journal," Sept., 1913). His account, gathered from Egyptian Bedouin, is remarkably accurate in most details; by Lt.-Col. Tilho, in his article on Tibesti and Ennedi ("Geogr. Journal," August—October, 1920); and two descriptions, one by Um Metto Kababish and one by Howawir, are given in the old Sudan Government Intelligence Reports of July and October, 1916. These last two reports are fairly full and correct in some details, but not in others.

Since its discovery in 1925, no full account of it has been published, though a short paragraph on it occurs on p. 221 of Dr. Ball's article on "Problems on the Libyan Desert" (*Geogr. Journal*, Sept., 1927), and a passing mention by M. Tilho in a note in "*Les Comptes Rendus de l'Académie des Sciences*" (1,183, p. 935, 22.11.26). Moreover, the depression had not been fully explored, as we discovered two water-bearing depressions to the North-east and some antiquities not previously reported.

In view of this and of the political importance of the Oasis in the question of raids and counter-raids across the international frontier, we set ourselves to explore and describe it fully. A larger scale map (1 inch to the mile) was made of as much of the Oasis as we could cover, with heights obtained by trigonometric levelling, marking the various palm-groves and the grazing. Specimens of grass and rocks were collected and a full account of the geology and vegetation will be found in the Appendices. Notes on the birds were made, and on the mosquitoes and insects infesting the lake. The lake itself was measured and sounded by swimming in it and dropping a plummet at intervals. Its deepest part is only 11 feet, and most of it not more than 4 feet. A bathymetrical sketch plan was made which may be useful to gauge any future changes in the water level. The lake is 270 yards long by 140 yards wide, and Dr. Ball records its surface as 1,670 feet above sea-level. Its waters, of which a sample was taken, are very salt, and believed by the Arabs to have a medicinal value. The lake is deep-set among high dunes on three sides, and the fourth is open, letting on to a belt of palms and an overflow area of salt-caked ground and halfa grass. The water edge is fringed with a dense growth of very tall feathery reeds on all sides.

The vicinity of the lake swarms with mosquitoes, voracious, but, apparently, non-malarial. There were ten duck upon the water when we arrived and a large bird which may have been a heron. It is difficult to know how they arrived there or where they go, if they migrate, but we later found a duck's track in absolute desert about 85 miles North of Nukheila. We shot two, which proved very good eating. We hoped that the others might take flight in the direction of Zorzura Oasis, and had set the theodolite in the meridian on the top of a dune so as to get a true bearing on their flight through the telescope, but they merely circled round and round.



DESCENDING TO NUKHEILA OASIS.



CAMELS BEING WATERED AT NUKHEILA OASIS.

On the morning of 29.11.1927 we shifted our camp two miles South-west to a thick grove of palms and big *seyals*, which we called Wa'ara el Abid, from the many Guraan tracks found therein. This move was made to give the camels better grazing and to get away from the biting mosquitoes. We had watered the camels the day before from a well dug by the Arabs with a canvas bath for a *hād* (trough), about 500 yards North of the lake. The water was only two feet below the ground surface in shelving sand, very clear and sweet. The Howawir say it was at the same close level ten years ago and can be found anywhere in the Oasis by digging.

While the camp and the baggage was being moved to Wa'ara el Abid, we rode out about five miles North-west of the lake and back by a detour in order to collect material for the 1-inch map and look for traces of Guraan. We climbed a number of hills to view the Oasis. It is not easy to get a bird's-eye view of it as a whole.

The general impression is of a large basin surrounded on South and South-west by a dune belt, and on the North and East by sandstone ridges. The floor of the basin, some eight miles by six, is broken by red and white sandstone hills and ridges; in the flat spaces and hollows between lie the five main palm-groves. The scattered grove North of the lake contains most trees, probably about 300. The aggregate for the other groves is about 500—700, making a total for the Oasis of 800—1,000 mature date palms. The Arabs say the number has decreased in the last decade. It is the dominant tree in the Oasis. Although by this time (December) all the dates had been collected and removed, there was every sign of there having been an excellent crop, ripening in September and October. This crop is annually picked by Guraan and other tribes from French territory; but Bedayat from Northern Darfur take a share. There were still a few remaining on the trees and their flavour was excellent.

Other trees are *sellim*, *seyal* and *terfa*.

The grass grazing of the Oasis is good, especially the *hād* at the South end. *Hād*, *ekhlis* and *halfa* are the dominant species.

At Wa'ara el Abid there were many recent indications of Guraan occupation, fresh tracks of men and animals, ashes, etc. The most interesting Guraan relic was their sacred tree, which we found at the South-west end

of the grove. This is a large old *seyal* tree, now dead, half lying on the ground with two thick branches sticking up in the air. On one of these, about face-high, is a smooth patch smeared with camel-fat, and on the other branch is a leather thong, cut from the skin of a camel, bound tightly round. In the crack below, where the two branches fork from the trunk, are smeared the partly-digested grasses, etc., from the intestines of the camel. The Arabs told us that the Guraan always slaughter a camel here before starting off on a raiding expedition and carry out these operations on the tree. It seems to be more than an ordinary *karama*, a slaughter for luck, and rather in the nature of a sacrifice to a tree spirit. Hamatulla remembered having seen trees similarly decorated when raiding into the Guraan country.

During our ride round the Oasis we found many other recent traces of Guraan, especially in the grove $2\frac{1}{2}$ miles North of Wa'ara el Abid, including reed-huts, bones of game and gazelle traps. One set of tracks of seven camels and three men, probably carrying dates and going North-west, was only a few days old, and another recent set showed six men riding East, *i.e.*, towards Dongola.

On the afternoon of 29.11.1927, the *naga* was slaughtered with due ceremony, Mohammed Abdulla, the doyen of the guides and a skinny veteran, wielding the knife, and bearing off one of the feet, which are a great delicacy roasted in ashes under ground.¹ She was a big beast, and, on dismemberment, was found to be pregnant with twins! The meat was quickly cut up and distributed and hung on the trees to dry. As only one gazelle was shot at Nukheila, and there was likely to be no game ahead, this meat was a great boon to the Arabs.

This evening at sunset there was a shout of "El Abid! El Abid!" (*i.e.*, "The Slaves!" the contemptuous name given by the Arabs to the black Guraan), and we all ran to our rifles, but it was a false alarm. Later, in the dark, there were more shouts and the thudding of hoofs, but it was only the camels coming in from the grazing in the dark and stampeding at the blood and smell of the slaughtered *naga*.

During all these days we had an armed guard over the camels at grazing and patrols round the camp both by day and night. The Guraan

¹ It is alleged that the degenerate Roman Emperor Elagabalus was very fond of camels' feet, which he claimed to have invented as a dish. *Vide* Huc and Gabet's "Travels in Tartary," 1844-6 (p. 269 of Broadway Travellers' Edition, 1928).



CAMP NEAR THE LAKE AT NUKHEILA.



THE SALT LAKE AT NUKHEILA OASIS.

usually attack with a rush at midnight, preferably with a full moon at their backs.

On the morning of 30.11.1927, Hussein Mattar and four others rode off to look for the small oasis which he had found North-east of Nukheila in 1916. They returned next evening, having located it about a day's march away. This was fortunate, as it gave us a nearer starting point for Selima.

On 3.11.1927 we started for this place, but Mattar Abdulla, the young guide, who had gone ahead to bathe in the lake, caught us up afterwards with a badly-cut foot, having spiked the sole on something sharp in the water. As he was nearly fainting from loss of blood, we camped at the North-eastern end of the depression near a palm-grove four miles from the lake. Next morning we made a short march of six miles over a col to a small basin among isolated hills with green *hād* grazing and *tundubs*. Here we found some interesting rock pictures on a small hill (see Appendix VII). These were a welcome discovery as a link between the pictures discovered by Hassanein Bey at Owenat and those at Zolat el Hammad and Jebel Tageru, South of Bir Natrun.

The same afternoon, 4.12.1927, we crossed the watershed which borders the Nukheila depression on the North and descended into the broad valley which we named Wadi Hussein, after the guide, Hussein Mattar. This valley, the existence of which was unknown to Dr. Ball, runs roughly East and West for some miles either side of the spot where we camped, about 17 miles North-north-east of the lake. The descent to it from the watershed is steep but on the North it rises gently till it fades into desert. The floor is covered with sand hummocks overgrown with *hād* and *ekhlis* grass. There are no trees, except a few *tundubs* and two small clumps of date palms. One, of nine palms, a quarter of a mile from our camp, is probably the Tamar el-Qusar, mentioned in old reports, as being an outlying spot with a well North of Nukheila. Water can be found anywhere in the vegetation area. At the lowest spot it was found to be within three feet of the surface. It was slightly salt, but quite good.

Later on our route North we found that this Wadi comes to an end in a sort of *cul-de-sac* about seven miles to the East. The vegetation, presumably, soon dies out similarly on the West, as Dr. Ball, who passed North 11 miles West of our camp, does not record this *Wadi*, but merely a sandy plain.

Both on the way to this *Wadi*, and on a prominent isolated group of hills near our camp, we found a number of rock pictures of which some were coloured.

On 5.12.1927 the camels were watered. They drank well, as they had been purposely kept for seven days without water in Nukheila, in view of the long waterless stretch ahead. The following day they were *howwashed*, i.e., taken to water again, a well-known Arab practice to ensure a full watering before a long journey.

There was a number of game tracks in the *Wadi*, but we saw no animals. There were traces of Guraan and this *Wadi* would prove an excellent stepping-stone, with its water and grass, for raiders from the West to Dongola, if Nukheila were, for any reason, barred to them.

The weather was now quite wintry with fresh North-easterly winds. The daily temperatures had come down with a jump after our entry into Nukheila, and here in Wadi Hussein the minimum Fahrenheit temperatures for the three nights were 29° (3° below freezing), 34° and 37°

SECTION 7.—TAMAR EL QUSAR (WADI HUSSEIN) TO SELIMA OASIS: 275 miles. (No. 1/250,000 maps are printed of this area except Selima, Sheet 34—L).

Dep. Tamar el Qusar, 7.12.1927, a.m.	} 20 <i>shidds</i> , } 10 days.
Arr. Selima Oasis, 16.12.1927, p.m.	

The caravan left Wadi Hussein for Selima at dawn on 7.12.1927. We did not strike directly out on to the desert, but did a short march of five or six miles due East to another small valley of grass and a few trees lying in the foothills at the South-east corner of Wadi Hussein. This small depression, an oval of about five square miles, hardly worthy of the name of oasis, also has water just below the surface and good grazing. It had been discovered two days before by two of the Howawir, who had gone out to hunt game. We made our noon camp here and found an obvious prehistoric site with a few more rock pictures and the usual pestles, grind-stones, pottery, and ostrich shells. We consequently named this place *Wadi El Anag* ("The Valley of the Prehistoric Men"). It seems to connect with Wadi Hussein.

There were many traces of fairly recent occupation by Guraan, fires, camel and other bones, and the horns of a big mountain sheep.



SALT LAKE AT NUKHEILA OASIS.

On the same afternoon we took the road for Selima in earnest. The Howawir guides were now at the limit of the country they knew and we led the caravan ourselves by compass, on a true bearing of 25° previously decided on. The direct line to Selima was much more to the East on a bearing of about 55° . We made this wide westward *détour* in order to explore the unknown desert lying West of the Arbain road, and particularly in the hope of discovering the legendary oasis of Zerzura, which historical evidence and native rumour, reinforced by a recent article by Dr. John Ball in the "Geographical Journal," had led us to place approximately at the intersection of Long. 27° and Lat. 21° (For sources of the evidence of Zerzura, see Appendix IX).

From now onwards to Selima our route lay over pure desert, and the narrative of our monotonous marches over this dreary waste is best given in brief diary form. Hours of march are given. Our rate was 2.7—2.9 miles per hour.

7.12.1927. CAMP 32 (WADI EL ANAG) TO CAMP 33. 12.50 P.M.—6.15 P.M.: 15 MILES.—About four miles from Wadi el Anag we crossed the Wadi Hussein again. It appeared to die out here about 1,000 yards to our East in a *cul-de-sac*. Its floor was littered on the North side with ancient stone pestles and grindstones. We soon climbed out of the Wadi on to the desert plateau, passing an old road with a bearing of 55° , which must be an ancient caravan route to Selima, possibly the "Selima-Wara" route marked on the 1/3M. map of the Sudan, 1921.

Last seven miles after Wadi Hussein flat, pebbly desert. Some trouble in finding any object on the forward horizon on which to take bearings, a grim hint of the difficulties in direction-finding facing us ahead. Just before sunset caught sight of low range of hills with a knob at West end far ahead. A mile South of camp 33 we came on a perfect stone axehead or hoe, half-buried in the sand, exactly between our two camels. A welcome indication that man at some period had traversed this wilderness.

As there was no grazing, we began this night to issue grain (*dukhni*) to the camels, 5 lbs. each.

8.12.1927. CAMP 33—CAMP 34. 4.10 A.M.—9.40 A.M.: 15½ MILES.—Over bare plain, fine gravel surface. Crossed one shallow valley with a few *tundub* trees covered with live locusts, some dead birds, and a little *agul* and *ekhril* grass. Addax track here. Thence ground rose

slightly to low range seen over-night stretching South-east from a solitary hill. We camped under this hill and called it Niseib el Hudud (boundary knoll), as it lies very near the Dongola-Halfa Province boundary. It was 80 feet high, and the first and last hill we saw, except the rock of Burg el Tiyr, between Nukheila and the hills of Selima.

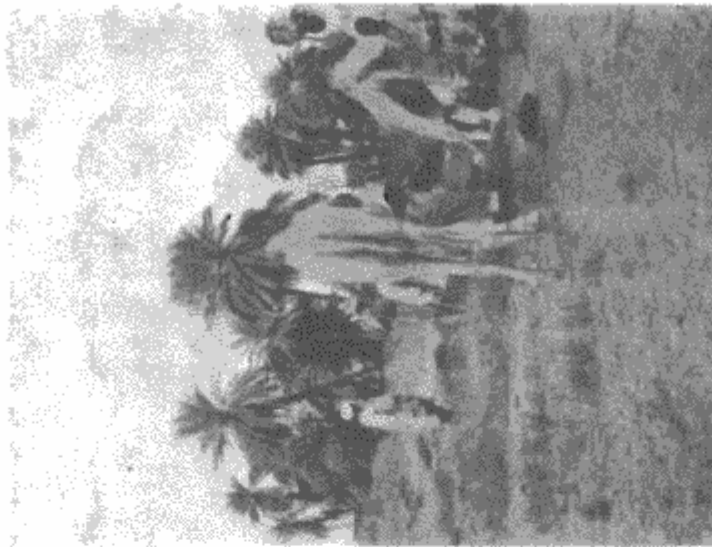
CAMP 34—CAMP 35. 1.35—4.45 P.M. $8\frac{1}{2}$ MILES.—Again over barren desert, going not so good, low stony ridges with gravel patches; one small *tundub* broke the isolation: 16 hungry camels wedged themselves round it, and it vanished. Camped on low ridge with back view to Niseib el Hudud and a few patches of *hād* and *ekhrī* grass. Total eclipse of the moon this evening.

9.12.1927. CAMP 35—CAMP 36. 3.55 A.M.—9.40 A.M.: $15\frac{1}{2}$ MILES.—Till sun rose, marched on η Draconis. An hour before dawn came on praying circle of white stones. Going bad over undulating and stony plain. A depressing march. Noon camp, a little *ekhrī* and dry *hād* grass.

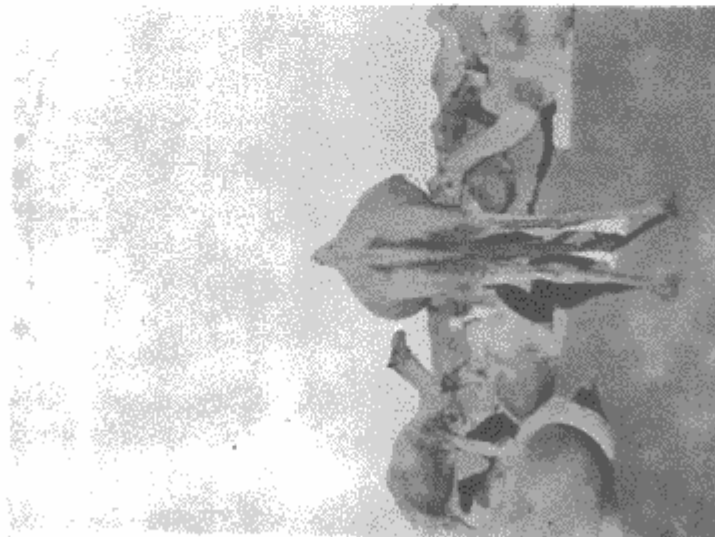
CAMP 36—CAMP 37. 1.35 P.M.—6.5 P.M.: $11\frac{1}{2}$ MILES.—Bad, stony going. Ugly featureless desert of interminable low ridges, with meagre sporadic tufts of grass. Rather warmer. Altogether a tiring day, and bad for the camel's feet. Salim Orangil reported a duck's track; on our scepticism swore it was a bird with "sewn-up toes."

10.12.1927. CAMP 37—CAMP 38. 3.40 A.M.—8.40 A.M.: $13\frac{1}{2}$ MILES.—Going improved, but still too hot for comfort. Wind out of the North-east, and noon temp. 93° F. Camped for mid-day at unexpected patch of *hād* grass, 150 plants counted, say three or four to each camel, in the circumstances a fair lunch. It was the last grazing for 170 miles. Gazelle track led to a solitary *tundub*, which helped to replenish our dwindling fuel. Mirage rampant this morning, distorting everything during the hour after dawn. Small ridges look like cliffs, and general elongating effect.

CAMP 38—CAMP 39. 1.55 P.M.—6.50 P.M.: $12\frac{1}{2}$ MILES.—Going fair over stony desert with sandy patches, very undulating. Pace falls to $2\frac{1}{2}$ m.p.h. on account of heat. About sunset reached a broken but rather prominent ridge, which we eagerly mounted to see the country in front, as we were now about 110 miles North-North-east of Nukheila, and this was first possibility of a decent view since Niseib el Hudud. We did not yet hope to see Zerzura, as, according to our aneroids, the ground



SAME CAMEL AT HIS NEXT DRINK AT SELIMA AFTER
275 MILES IN 10 DAYS.



CAMEL AFTER WATERING IN WADI HUSSEIN.

level was still at least 400 feet above the probable static water level. Until the two contours approached within 150—200 feet of each other there was no likelihood of any oasis depression whose floor would be water-bearing. Neither Nukheila nor Selima plateaux exceed 200 feet above the oasis floor.

But we hoped that the land surface would show a downward tilt in some direction and give us a hint whether an oasis could lie to North or North-east. Our luck failed, for the actual panorama was an empty and forbidding desert with no signs of any real drop. After a consultation we decided to bear a little more East henceforward and camped on a bare patch of sand among boulder outcrops beyond the ridge. The wing of a migrant bird was picked up hereabouts.

11.12.1927. CAMP 39—CAMP 40. 3.15—9.30 A.M.: 17 miles.—Marched on γ and δ Bootis before dawn. Going improved. Almost flat desert, stony, with good sandy patches. Entirely featureless, descending gradually. Saw gazelle track, and passed a crumbled camel skeleton, very old. Camels going better. Many of us now walking. Picked up another bird's wing.

CAMP 40—CAMP 41. 1.30 P.M.—5.45 P.M.: 12 miles.—After about six miles, the stony country and undulating ridges of the last few days gave place to an almost flat, sandy desert, with a few patches of stones, which themselves later died out; our evening camp was pitched on a dead flat desert, lifeless and featureless, resembling a gramophone disc. In this march we saw neither a bone, nor a track, nor a blade of grass. The camels now going loose, untied. This gives the men more freedom, and there is no danger of any camel straying from the caravan in this awful waste. The leading pair are led or driven. Cool North-east wind.

12.12.1927. CAMP 41—CAMP 42. 3.25 A.M.—10.50 A.M.: 21½ miles.—Marched first on β Bootis, then ϵ Herculis, a true bearing of about 47° over the same disc-like desert, excellent going over firm sand. These early morning marches were bitterly cold. The cold North-east wind makes the camels bore to the right and it is hard, when riding drowsy and muffled up, to keep one's camel's head on a star. So we mainly walked. But this difficulty was increased tenfold when the stars paled and the sun rose. We then found it impossible to lead the caravan in a straight line on a bearing, as there was nothing, even the

size of an egg, on which to align the compass. We had resort to a device of making small sand heaps at short intervals on the required alinement. By continual backward glances at these, it was possible to maintain our direction. For seven hours and a-half we crawled over this desert like ants on a giant soup-plate. Occasionally we came on the bodies of dead migrant birds half buried in the drift sand. These were dug up and eaten by the two Arab dogs who were with the caravan.

About 8 a.m. we came on a meagre patch of a brittle *nissa* grass on a slight rise, years old and partly buried under driven sand. In other circumstances we should have spurned it, but in a flash every man was off his camel scraping furiously at the wretched stalks and roots with joyful shouts. The effect on the camels was psychological rather than gastronomic, but none the less inspiring.

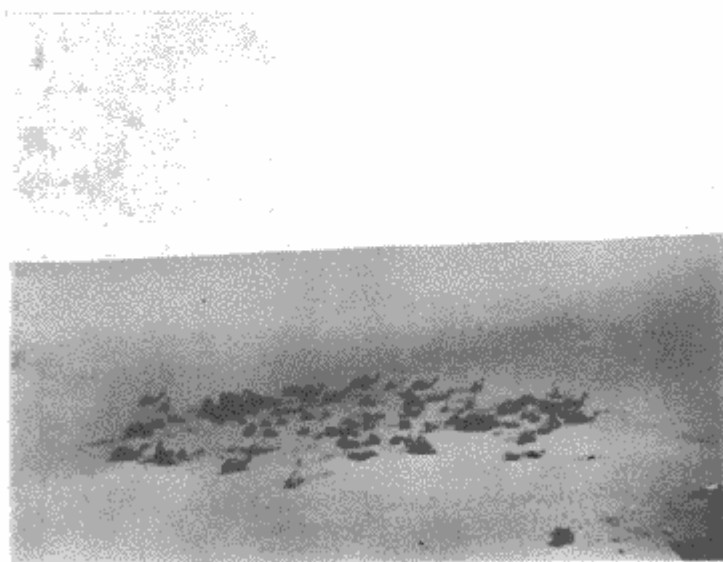
About here the sandy plain became more rolling and a number of dunes came into sight together with a prominent rock. We made for this and camped under it. It stands on a low sand ridge, its top only some 25 feet above the plain, but conspicuous for about eight miles. It was composed of a hard, smooth sandstone, and is obviously the halting-place of migrant birds, as we found scores of corpses around the rock and in its clefts, and masses of semi-petrified excrement. It was also the eyrie of resident hawks (*see* Appendix VI). We therefore named it *Burg el Tiyur* (the tower of the birds). We also found here a rock picture of an ox, of the same Libyan type as the Southern pictures, an amazing discovery in so remote a place; a pestle and ostrich shells, sure signs of ancient habitation, were picked up.

We built a cairn of stones on this landmark, as being roughly our furthest point, and placed on it a tin containing a note of the latitude and longitude, and bearings and distances to Nukheila, Owenat, Lagia and Selima, the four nearest water-centres known, and a few other objects.

We had now come, at Camp 42, nearly 150 miles from our last water. It was pretty clear that Zerzura Oasis, if it existed, lay far out of our way to the North. We were faced, therefore, with the prospect of another 120—130 miles with no water or grazing if we wanted to reach Selima, or of a shorter stretch of 80 miles or so to Lagia wells to our South-east. We decided to stick to our objective—Selima—in view of the good condition of men and camels, and the cold and good going. We did not



BURG EL TIYUR.



THE CAMELS HALTED BELOW BURG EL TIYUR.

consult the Arabs, in order not to arouse alarm. In any case they had no conception of where they were.

CAMP 42—CAMP 43. 3.55 P.M.—6.55 P.M.: 9 MILES.—We now turned more East so as to strike Selima by the unknown area between the routes of Comyn and Jennings Bramley. Desert bare and sandy as before; after dark passed through a dune belt with less difficulty than expected; in drift sand at night.

13.12.1927. CAMP 43—CAMP 44. 3.20 A.M.—9.40 A.M.: 18½ MILES.—Another long *shidd*. Marching on the Eastern stars of Bootes constellation for the three dark hours. Cold before dawn was intense, in spite of Balaclava helmets and gloves, and was reflected in the camels' pace, which increased to three miles per hour on the good going. After dawn, passed out of the "gramophone disc" desert into a flattish sandy desert variegated by low sandstone outcrops. At the noon observation of the sun, to-day (N.B.—the 13th) the hairs of the theodolite diaphragm broke in a gust of wind. Luckily we had a spare glass diaphragm, but an element of uncertainty was now introduced into the observations. It was a coincidence that the same accident happened to Comyn about the same date 21 years ago on his journey near Selima.

To-day, the seventh from Nukheila, our fuel gave out and breakfast was cooked on the rods of a mosquito net. The Arabs' waterskins also were exhausted, and henceforth they drew from the *fantasses*.

CAMP 44—CAMP 45. 2.10 P.M.—5.50 P.M.: 10½ MILES.—Nothing to record beyond that we plodded from one point in a blank desert to another point in the same desert. Featureless surface relieved by

- (a) Track of a large bird alighting, alleged by Arabs to be a crane.
- (b) Skeleton of a camel.
- (c) One live locust.

With the locust to our credit we were slightly better off than the French traveller, M. Poncet, who, in 1698, went from Shebb to Selima and remarked, "In this vast wilderness there is not to be found so much as a little fly, nothing but mountains of sand and bones of camels, which imprint a certain horror on the mind."

14.12.1927. CAMP 45—CAMP 46. 3.20 A.M.—9.20 A.M.: 17½ MILES.—A bitterly cold night again. Minimum temp. 42° F. Crossed an easy dune belt in the small hours; then, again, a stretch of "billiard table" desert with a solitary camel skeleton, and at dawn once more the

"undulating sandy desert with low sandstone ridges" to find fresh epithets for which the cartographer strives in vain.

The first camel to weaken dropped behind to-day, but came into camp an hour later : was given a bucketful of water and six pounds of grain. The others going well and only being fed at night.

We were now 220 miles out of Nukheila and were still a day's march from where the knowledge of the guide Hamatulla could begin. The Arabs were still following us without question, but the absence of landmarks worried them, and there was a faint tinge of anxiety in the atmosphere.

CAMP 46—CAMP 47. 2 P.M.—6 P.M.: 11½ MILES.—An hour after leaving Camp 46 we passed a prominent *ālim* (signpost) of up-ended stones, which must mark the Terfawi-Lagia road, though no tracks were visible. Its discovery heartened the Arabs. Here we passed into very stony desert, developing at Camp 47 into a deeply-scored country of small irregular depressions and low rocky knolls. Poor going. Another camel skeleton.

15.12.1927. CAMP 47—CAMP 48. 3.15 A.M.—10 A.M.: 18½ MILES.—Soon entered the area of low reddish conical hills, described by Comyn, dotting the broken country far to West and South-west of Selima. At dawn we arrived at a hill with a good view forward to a long low irregular line of hills, which Hamatulla recognized as the hills of Selima. He had not, however, visited Selima for many years and not from this angle, and so was unable to place the Oasis in the confused mass of hills. With candour unusual in an Arab guide, he admitted this at once, an announcement which disconcerted the Howawir, who barely concealed their distrust of his ability.

On our part, although we were certain we were within easy reach of Selima, this doubt, coupled with the unreliability of the Selima 1/250,000 sheet on which we now were, and with the exasperating vagueness of Comyn's route report, was annoying. The guide was in no way to blame. In the circumstances we decided to bear almost due East, partly to strike the Arbain road and partly as he knew best the approach from the South-west: though we were confident that were we to continue on our bearing of 75°, we should hit the Oasis, as indeed we should have done.



MEMBERS OF PARTY AT CAIRN BUILT ON BURG EL TIVUR.



APPROACHING CAMP 44.

CAMP 48—CAMP 49. 1.55 P.M.—5.35 P.M.: 10 MILES.—After two hours going due East, passed numerous camel-skeletons, 'ālims, etc., which obviously marked the Debba-Lagia caravan route. Soon after we came on old car tracks running North-North-east. Followed these, but lost them in blown sand. Country more broken, going fair. At our evening camp took the guide up a hill, but he was still unable to locate the Oasis in the jumble of hills, although some black hills stood out prominently, which both he and we were inclined to identify with the group covering Jebel Selima Atshan on the West.

16.12.1927. CAMP 49—CAMP 50. 5.25 A.M.—11.5 A.M.: 15½ MILES.—The tenth day out of Nukheila: marched on the black hills, a true bearing of 89°, while Hamatulla and others struck more South-east to make certain of hitting the Arbain road. We, in fact, hit it with the main caravan after eight miles, but, unfortunately, in a valley where the tracks were faint and it ran North and South instead of East-North-east as mapped. So we were in doubt of its identity, and Shaw, with scouts, followed it North to verify it, while Newbold took the caravan on due East. It was the Arbain road, and on surmounting the plateau showed its true character—many deeply-scored tracks and numbers of camel skeletons—but, unfortunately, the rifle shots fired by Shaw, as a signal to bring back the caravan, were not heard in the wind, and Newbold went on to Camp 50 under J. Selima Atshan. Here Hamatulla rejoined us. We were at last certain of our exact whereabouts, especially as Shaw had seen the actual palms of Selima in the distance when he fired his rifle, though not where they are sited on the map.

The valley between the Arbain road and Jebel Atshan is a broad stony trough open to East and West, flanked by a broken cliff on the North leading up to a plateau, and by a long slope on the South, rising to high ground with scattered hills.

Here we distributed 40 gallons of water to the weaker camels: about half-a-dozen were showing signs of exhaustion.

CAMP 50—CAMP 51. 2.55 P.M.—7.40 P.M.: 13 MILES.—A hot and weary climb on to and across the plateau between the Atshan valley and Selima itself. After sunset we began to descend rapidly into the big basin, in which the Oasis lies, and presently sighted Jebel Tulia. Two hours after dark, with Hamatulla leading us on *el Jedi* (Polaris), we suddenly dropped into a little hollow with a black mass looming against

the stars. They were the palms of Selima. There was a chorus of *Hamdulillahi* (Praise be to God!). Within a few moments loads were off, fires were ablaze from the welcome fuel, and the camels were tearing at the grass, the prelude to an all-night feast. We slept.

SECTION 8. SELIMA OASIS. 16.12.1927, P.M.—19.12.27, P.M. (1/250,000, Sheet 34—L).—Selima Oasis lies, according to our observations, in Long. $29^{\circ} 20' 10''$, Lat. $21^{\circ} 22' 19''$, *i.e.*, about 11—12 miles West of its mapped position. The discrepancy is discussed in Appendix I.

No detailed description is necessary, as a good deal had already been written (*v.* especially T. Leach's article in *S.N. & R.*, Vol. IX, No. 2, Wall's Budge, "The Egyptian Sudan," and Gleichen, "The Anglo-Egyptian Sudan"). But previous notes on the topography are rather vague.

The actual Oasis is diminutive, being merely two groups of date palms with a few *doms* and tamarisk, and *halfa* and *ekhlis* grass. The palm groves are only 500 yards apart and lie in a cup at the North-east corner of the big depression. Water is found two feet below the surface, the best we have met in the Sudan.

Jebel Tulia is a black camel-backed prominent hill overlooking the palms from the North-east, but, lying as it does in the depression, its top is not visible from any distance outside. There is, in fact, no real landmark for the Oasis to a traveller from the North or West or South until he sees this hill.

The depression is fringed with hills leading on to a plateau about 200 feet above the actual Oasis. On the North and North-east is a high sandstone ridge of broken hills. The Arbain road cuts North through a gap in this ridge, winding steeply up on to a tableland, and thence bending slightly North-east towards Shebb wells.

The so-called "convent" at Selima is described in Appendix VII. We visited it and the salt-pans and the northern outlet of the Arbain road, and climbed Jebel Tulia.

On 17.12.1927 the camels had their first drink for 11 days. This evening a gale blew, and for the first time during the journey a cloudy sky prevented star observations. We were lucky not to have encountered this before.



SELIMA OASIS.



THE DARB EL ARBA'IN ENTERING SELIMA OASIS.

Our supplies were now rather low. There was no game at Selima. Unfortunately a police patrol, sent out from Halfa to meet us here, left the Oasis before our arrival, and we had no means of communicating with the river. Our chief need was grain for the camels, as the Selima-Halfa road is five days with no grazing at all. We could not wait many days to fatten them up as the men's food, too, was nearly exhausted.

In the circumstances we decided to make for the Nile at Sakiet el Abd, its nearest point, without delay, and after giving the camels $2\frac{1}{2}$ days' rest were on the march again.

SECTION 9. SELIMA TO SAKIET EL ABD (NILE).—(1/250,000 Sheets, 34-L and 35-M).

Dep. Selima 19.12.1927, p.m.	} 5 <i>shidds</i> , 76 miles.
Arr. Sakiet el Abd 21.12.1927	

This route is a more or less beaten track, and though no up-to-date route report exists, the 1/250,000 Sheets, with our added information, will give enough detail. It is easy going over hard barren desert, and J. Mahaisiat with its twin peaks, Jebel Arbagi and Jebel Abri on the East of Nile, conveniently mark the way. About half way a ridge gives a fine view beyond it, and is called by the Arabs "*Bab el Salām*," i.e., the gate of greeting to the Nile.

The map gave the distance between Selima and Sakiet el Abd as 65 miles. It turned out to be 75, and in our efforts to reach the river by the evening of the 21st, we marched 33 miles this day, which was a severe strain on our exhausted camels, especially as the bitter cold of these two nights had told upon their emaciated frames. We pushed on, however, leaving five or six stragglers to come in independently, and after crawling through the deep dune belt on the West bank in the dark, reached the Nile about 8 p.m. at the deserted village of Sakiet el Abd, and camped thankfully in a palm grove on the water's edge.

After 912 miles of sand we realized the feelings of Xenophon's Ten Thousand when they sighted the Black Sea.

SECTION 10. SAKIET EL ABD TO WADI HALFA.—103 miles along West Bank of Nile. (1/250,000 Sheets, 35-M. and 35-I.).

Dep. Sakiel el Abd 24.12.1927, a.m. } Nine *shidds*.

Arr. Wadi Halfa 28.12.1927, p.m. } Half-day halt at Semna.

We parted with our Arabs at Sakiel el Abd, and after two days' rest made our way on hired camels in leisurely fashion to Halfa. It was a great relief to be within continuous sight of water and grass, and to be freed from the perpetual tyranny of compass and theodolite.

This last stretch, which is well known and rigidly surveyed, brought our total mileage to 1,015.

APPENDIX I.

Notes on Cartographical Data.

By D. Newbold.

1. INTRODUCTION.

The Cartographical data consist of (a) a notebook containing the records and computations of astronomical observations for the determination of latitude at all the camps from 1—56, with three exceptions; notes on compass variation, and the working of the chronometer watches; (b) a route-traverse book, giving a continuous daily record of compass-bearings, wheeled distances, and camel marching rate, and a number of trigonometrical heights; (c) a notebook containing, *inter alia*, notes on the character of the country, wind, daily readings of maximum and minimum temperature, and a continuous record of aneroid barometer readings.

2. ASTRONOMICAL DETERMINATIONS OF LATITUDE.

A 3-inch Troughton & Simms theodolite, with a Vernier scale, reading to 1; and a level on the Vernier arm was used, and observations to both sun and stars were taken daily between Soderi and Sakiel El Abd. Altogether 167 star and 34 sun observations were taken in these 51 days. The instrument was carried in its two wooden boxes in a padded leather case, which itself fitted neatly into a wicker camel pannier, with Close's "Text book of Topographical Surveying" wedged behind it. It was borne thus on a camel for 1,015 miles without real ill effect.



THE GUIDE, HAMATULLA MOHAMMED OMAR.

The latitudes were all from observations of meridian altitude of sun and stars, the latter being identified from the star-chart in Close's "Text-book." Air-pressure and temperature was always recorded, and computations invariably worked out on the spot by the formulæ on page 218 of "Hints to Travellers," Vol. I (9th Ed.) and the Nautical Almanac. In nearly all cases F.R. and F.L. altitudes were read, but in all cases dislevelment was ignored.

As the latitudes between Soderi and Bir Natrun were not of great importance, most of this being desert and previously mapped, though not rigidly, a certain amount of liberty was taken in experimenting with the eyepieces, methods of lighting at night, fixing the tripod on sand, etc., in order to get as practice-perfect as possible for the unmapped country between Bir Natrun and Nukheila, and Nukheila and Selima. This did not, however, very materially affect the results up to Bir Natrun.

Thence onward all observations were taken with great care, and, wherever possible, one or more pairs of North and South stars were taken at night. Usually four stars were read, sometimes six or seven. As our route was for the greater part in a North and South line, the wheeled distances and rate of caravan's marching pace were an excellent check on the observed latitudes. The theodolite latitudes were compared at every halt with the wheel and compass latitudes and with the caravan's marching time. These three independent checks ensured a mean distance for the march which could not be greatly in error. According to the circumstances, either the theodolite or plotted latitude was accepted and put on the map at once so that what errors could arise would not be cumulative. In actual fact, the average difference between the astronomical and plotted latitudes did not exceed 20 seconds or 670 yards—if we omit one single case at Camp 45—the first day after the cross-hairs of the theodolite broke—where there was a divergence of two minutes. A comparative table was kept of these differences from Camp 31 (Tamar El Qusar) to 56 (the Nile at Sakiet El Abd). Camps 31—44 show an average difference of 18", in half the cases the plotting latitudes being in excess, and *vice versa*. Here I usually accepted the star latitudes as being more accurate than plotting, but plotting as being more accurate than the solar latitudes. From Camps 46—51 (Selima)—excluding Camp 45—the daily divergence was 23". From Camps 52—56, 19".

The following is a list of the more important latitudes :—

	Number of Observations.		Mean—Latitude.	Remarks.
	Nights.	Noons.		
Soderi (D.C.'s House) .	2 ... 1		14° 26' 12"	Mean of 5 altitudes.
Hamra (Camp 1) ...	1 ... 1		14° 35' 37"	6
Wadi Hawa (near High Goz).	— ... 1		17° 25' 13"	∴ "High Goz" = 17° 24' 43", i.e., is correct on map from 1923 wheel and compass traverse.
Bir Milani	2 ... 3		18° 08' 05"	Mean of 11 altitudes.
Bir Natrun	1 ... —		18° 12' 23"	" " 4 "
Nukheila (Camp 27) ...	2 ... 1		19° 02' 48"	" " 9 "
Nukheila (Camp 28) ...	1 ... 1		19° 01' 31"	" " 5 "
Tamar El Qusar	1 ... —		19° 15' 35"	" " 4 "
Niseib El Hudud	— ... 1		19° 39' 18"	—
Burg El Tiyyur	— ... 1		20° 56' 31"	—
Selima	1 ... 1		21° 22' 29"	" " 6 "

At Camp 44 the cross-hairs of the diaphragm broke and were replaced by a spare glass diaphragm. It was unfortunate that this happened at the time we were bending eastward, as more accurate observations were needed than when going North and South, but, in fact, the subsequent results squared pretty well with the plotting.

At Camp 52 the small torch gave out and refills were bad, and so the big "Hellesen" torch was used. Unluckily the Vernier plate on the circle was now a trifle bent outwards, and would not lie flat, and this produced an effect of parallax with the brighter torch. Consequently plotted latitudes were taken between Salima and Sakiet El Abd (exclusive), but it is curious that the star latitudes, though often varying *inter se* by as much as three minutes, produced mean latitudes whose average divergence from the plotted latitudes was only 19".

Of the above list of latitudes, Soderi differs by about 2' 45" from the 1/250,000 Map, but it is difficult to site the village on the latter, as it has moved. Our latitude is confirmed by resection on triangulated hills of Rueis and Katul.

Hamra squares well with resection from neighbouring hills as previously sketched.

W. Hawa may be taken as correct, as it coincides to 100 yards with the wheel and compass sketch of 1923.

Bir Milani and Bir Natrun likewise.

Nukheila Camp 27 agrees within one second with Dr. Ball's Camp 26 after allowing for the 650 yards distance apart.

Camp 28 similarly agrees closely ($-6''$).

Tamar El Qusar is a new latitude, but probably accurate as two North and three South stars agreed within $7''$.

Niseib El Hudud's plotted and Solar Latitudes differed by $8''$.

Burg El Tiyyur's plotted and Solar Latitudes differed by $42''$.

Selima's latitude (Camp 51, under Seyal Tree in southern palm grove) differs from prior latitudes as follows:—

1. Newbold, $21^{\circ} 22' 29''$ (six readings ranged from $21^{\circ} 22' 05''$ to $21^{\circ} 22' 56''$).
2. Sheet 34—L, $21^{\circ} 22' 12''$ (approximate measurement of Camp 51 from Convent).
3. Comyn, $21^{\circ} 21' 32''$ (? site of obs. not known. Two observations taken).

Apparently 2 is based on 3, if Comyn took his observations in the northern palm grove.

3. LONGITUDES AND DEAD-RECKONING.

Although two chronometer watches were carried, no observations for time were made for purposes of longitude, for these two reasons: (a) because we were never in one camp more than three days, and were so much on the move that it would have been almost impossible to check the chronometer rate; (b) with a Vernier theodolite and an inexperienced observer, it was unlikely that time observations would give as accurate longitudes as the dead-reckoning. In commenting on the accuracy of careful plotting by Hassanein Bey, Dr. Ball (Appendix to "The Lost Oasis") remarks, "It may, I think, be concluded that no better values for the longitudes can be obtained without the aid of wireless time signals."

It is well known that errors of direction by badly-read compass bearings or in marching on reference objects are apt to cancel each other in an astonishing manner (see Close's "Textbook, etc.," page 79). We endeavoured to minimise these errors by taking numerous forward and back bearings, as well as bearings on features off the track. When the traverse was plotted from Bir Natrun to Nukheila, a discrepancy of

2' 40" was discovered. It is not easy to decide the cause of this. Jebel Naddāra as plotted backwards from Dr. Ball's fixed position of the Lake is 23 miles west of its position, as plotted from Bir Natrun. There seem only two possibilities: (a) that Bir Natrun is wrongly sited on Sheet 44 F. Its longitude has never been determined astronomically or by wireless; (b) that our plotting contains large errors in bearings, either owing to insufficient allowance for compass variation or other reasons.

Until Bir Natrun's longitude is rigidly obtained, it seems best to distribute the whole error along the 65 miles. N.B.—The figure of our marching rates and wheeled distances seem to corroborate an error in the original longitude of Bir Natrun.

The longer traverse from Nukheila Lake to Sakiet El Abd (370 miles) was more satisfactory, closing with an error of only $2\frac{1}{2}$ miles in longitude. Actually the traverse was not plotted right through to Sakiet, but from Nukheila to Selima, and then *backwards* from the fixed point of Sakiet to Selima, and these two positions of Selima were found to be 2' 02" in variance. The longitude as plotted back from Abri (Sakiet El Abd) has obviously less margin of error, especially as the Jebels of El Mahaisiat, Arbagi, and Abri ensure accurate direction all the way, and therefore it was accepted, and the discrepancy of the $2\frac{1}{2}$ miles has been distributed between Camps 42 and 50, *i.e.*, roughly from where we turned east.

The co-ordinates of Selima, in this case, appear as Long. $29^{\circ} 20' 10''$, Lat. $21^{\circ} 22' 29''$. The position of this camp in Selima would be on Sheet 34 L as previously mapped. Long. $29^{\circ} 30' 50''$, Lat. $21^{\circ} 21' 12''$. This shows a rather startling discrepancy of a fraction over 12 miles in longitude. This can only be satisfactorily accounted for by assuming that the previously mapped position is wrong. Our plotted distance to Sakiet, whether we rely on marching times or on the wheel, works out as 76.1 miles, and there seems little room for error in this figure, which fits the theodolite latitudes, the wheel, and the camels' rate alike. The distance from Selima to Sakiet as sited on Sheets 34 L and 35 M is $65\frac{1}{2}$ miles, a difference of over 10 miles. It is unfortunate that we have no other detailed route report of this road, but in 1903 Capt. Hodgson went from Selima to Kosha, which he makes $79\frac{1}{2}$ miles. He apparently went North of Arbagi and struck the river opposite Ginnis, East of Sakiet. His first halt was $38\frac{1}{2}$ miles, 2 miles past "twin peaks." These

are obviously the two hills of Jebel Mahaisiat, which I made $38\frac{1}{2}$ miles themselves, *i.e.*, two miles further. This still leaves eight miles to account for.

Mr. E. Pease, Deputy Inspector of Halfa, in September, 1903, stated that laden camels took 29 hours from Sakiet to Selima (river to Arbagi $9\frac{1}{2}$, Arbagi to Abudria (?) $4\frac{1}{2}$, and Abudria to Selima 15). He adds "my own camels made just short of three miles per hour." Assuming the "laden camels" to have made $2\frac{1}{2}$ miles per hour, the distance becomes $72\frac{1}{2}$ miles, and if 2.65 miles per hour, which was our rate for the 240 miles to Bir Natrun, when well laden, it becomes 76.8 miles. This corroborates our results. Hodgson had neither theodolite nor wheel, and Comyn a theodolite only, and he approached Selima from Terfawi and Shebb, and went on to Lagia. He took sun but no star observations.

The route report on pages 190—192 of Gleichen's "Handbook to the Sudan," Vol. II (based on journeys Lt.-Col. Colville, 1884, Capt. H. G. Lyons, 1894, and others) states that Selima to Sakiet El Abd is 80 miles.

For certainty we must await, as in the case of Bir Natrun, a fixation by wireless or astronomical time observations.

A few notes on our experience of marching on stars and bearings may be of use. From Wadi El Anag to Selima, 269 miles, no guides existed who knew the country, and we marched always on prearranged bearings.

We usually started between 3.30 a.m. and 4 a.m., and therefore had from $2\frac{1}{2}$ to 3 hours marching by the stars. For the first few days we set the theodolite overnight on the required true bearing, and at 3 a.m. selected the *low* star nearest to this bearing, and marched on it till it was over 15° above the altitude of Polaris, and then on another low star conveniently below it. These stars were identified on the spot with the star-chart and a torch, and entered on the route book with times of taking them and leaving them. As they were all on the vertical part of their circumpolar movement, their lateral movement did not exceed 1° or 2° , and a diagram was drawn on squared paper depicting their hourly motion, from which their lateral distance from Polaris could be measured in degrees, especially as our axis of march was mostly from 25° — 50° East of North, and Polaris at this time was about 20° of altitude above the horizon.

The danger of error did not, however, lie so much in these calculations as in the difficulty of marching straight on the stars. There were two things continually tending to drag one off the line: (*a*) the cold wind which made the camels bore to one side; this was obviated, of course, by our walking as much as possible; (*b*) the unconscious pull of the glimmer of the hour before sunrise or of a bright star near the actual star marched on, *e.g.*, sunrise was about 113° true bearing, and the first flush of dawn always drew camels and men alike unconsciously towards it; similarly, when marching on the lesser stars of Bootes—we used β , γ , ϵ , ζ , η , all in turn—I found my eyes being continually drawn from these dimmer stars to Arcturus, the brightest star in the constellation.

It all seems to be a matter of practice and alertness, and of luck in finding a bright star low down on the horizon at the required angle.

Difficulties in marching on stars are small compared with difficulty of marching in daylight on a line over featureless desert. The only solution is to take frequent bearings on objects a few hundred yards ahead, and frequent back bearings as a check. But sometimes, as in the "gramophone disc" desert, there are literally no objects, and, as narrated in the route report, we had recourse to making sand-heaps behind us along the required axis of march. It sounds absurd, but it is impossible for a human being to walk in a straight line over flat, featureless desert without looking at his tracks behind him as a check. A cold wind on one cheek makes one bore away from it; sunrise on a flank draws one to it.

The worst time of day, as is well known to Arab guides, is the hour or half-hour before dawn after the stars have paled and before it is light enough to take bearings ahead.

4. USE OF CHRONOMETER WATCHES.

Two chronometer watches were carried and continued going satisfactorily until the end of the journey, with the exception of a stoppage each in the last few days from forgetfulness to wind them. They were not used for time observations, but merely for timing the latitude observations. The L.M.T. of the sun's and selected stars' culminations was worked out from time to time, and the watches used simply as time-pieces to catch the sun and stars on the meridian.

Various attempts to check their accuracy were made by observations for equal altitude and by setting the theodolite in the meridian and timing the passage of a number of stars across the vertical hair. None of these observations were really successful, but they showed that the watches were not erring violently. Owing to the failure of wrist and other watches during the journey, these chronometer watches were an important item of equipment. They were carried in boxes, put inside camel panniers among clothes.

5. COMPASS VARIATION.

A small number of observations were made for the purpose of determination of the magnetic variation of the compass. Two methods were employed:—

- (a) Taking compass bearings to a consecutive sunrise and sunset in one place: this could obviously be only done at our main stopping places.
- (b) Putting the theodolite in the meridian by equal altitudes of sun or star and then getting the true and magnetic bearings of reference objects.

The trough compass of the theodolite did not fit and could not be used.

Unfortunately none of our three prismatic compasses could be read to closer than a degree, except in favourable conditions of light, and of the two oil compasses one was apt to stick and one had a large bubble. However, in most cases a number of readings was made on one or two compasses and the mean taken. The results are as follows:—

Place.	Month.	Compass Variation.
Camp 5 { Long. $27^{\circ} 52'$ Lat. $15^{\circ} 15'$ }	November, 1927	$2^{\circ} 53'$ W. (1 obs.).
Bir Milani (Natrun Oasis)	November, 1927	$2^{\circ} 30'$ W. (2 obs.).
Nukheila (Lake)	November, 1927	$3^{\circ} 12'$ W. (3 obs.).
Tamar El Qusar	December, 1927	$3^{\circ} 11'$ W. (3 obs.).
Camp 38 { Long. $27^{\circ} 01'$ Lat. $20^{\circ} 17'$ }	December, 1927	$2^{\circ} 59'$ W. (1 obs.).
Selima	December, 1927	$2^{\circ} 22'$ W. (2 obs.).
Sakiet El Abd	December, 1927	$1^{\circ} 35'$ W. (2 obs.).

When we compare these results with those obtained by Hassanein Bey in 1923, 200–250 miles to the westward, e.g., Erdi $3^{\circ} 57'$, Enebah $4^{\circ} 21'$,

Bao $4^{\circ} 59'$, and the variations for 1927 on the Nile about the same distance Eastward; W. Halfa $0^{\circ} 50'$, Merowe $1^{\circ} 35'$, we find, after making allowance for the decrease since 1923, that they accord roughly with the isogonic lines as far as they are known in this part of Africa. The margin of error, however, is probably large, perhaps $\pm 45'$. If Dr. Ball's observation of Nukheila in January, 1925, viz., $2^{\circ} 42'$ is right, then 1927 (November) figure should be $2^{\circ} 20'$, which exceeds this error. The figures in the above table were accepted for plotting purposes, in converting magnetic to true bearings.

6. RATE OF CAMEL MARCHING AND USE OF WHEEL.

Hamra—Bir Milani (Camps 1-21) was 269 miles. A comparison of mileage marched and hamla hours taken between Camp 5 and Camp 20 shows that the hamla (without appreciable halts) marched $205\frac{1}{2}$ miles in $77\frac{1}{2}$ hours, i.e., 2.65 miles per hour. The hot weather had not gone, and the camels were fully laden. We were doing about 10 hours a day.

From Bir Natrun to Nukheila lake the wheel was put into use as an additional check and we got the following results:—

Camp.	Wheel as Registered.	Wheel Less 10 %	Hamla at 2.8 m.p.h.	Hamla at 3 m.p.h.
22 to 23	17.7	16	16.1	17.25
23 to 24	10.5	9.5	9.5	10.2
24 to 25	7	6.3	6.3	6.75
25 to 26	19	17.1	17.1	17.8
26 to 27	17.9	16.1	15.6	17.8
TOTAL	72.1	65.0	64.6	70.3

It will be seen that columns 2 and 3 agree closely. The colder weather and rest and grazing at Bir Natrun made the camels increase their pace slightly—by .15 miles per hour. The 10 per cent. deduction for the wheel is the normal deduction for "joggling," etc., by an unskilled pusher. I arrived at this figure after wheeling over 500 miles of my 1923 journey to Bir Natrun. In this case it fits with the distances obtained by theodolite latitudes.

We therefore accepted 2.8 miles per hour provisionally as our likely rate from Nukheila to the Nile, and 10 per cent. as the normal deduction for the wheel.

In actual fact the figures worked out as follows:—

	Wheeled Mileage.	Wheel, less 10 %	Plotted Dist. Accepted.	Hours Marched.	Average Rate m.p.h.	Average Hours Marched Daily.
Tamar El Qusar to Selima (10 days)	301.25	271.1	275	98	2.8	9.8*
Selima to Sakiet El Abd (2½ days)	84.7	76.23	76	26.116	2.91	10.5

*10.1 hours excluding the first short march.

We found that with practice we could usually guess the caravan's pace within .2 miles per hour.

7. SKETCH MAPS.

The entire route from Hamra El Sheikh to Sakiet El Abd was plotted on to sheets of squared paper on a scale of 1/250,000 day by day. Owing to lack of time a certain amount of detail was left to be put in at leisure, but all the camps, chief features, and actual route marched were plotted in at each noon or night halt. The meridians and parallels of longitude and latitude were drawn on these sheets with the aid of the Graticules for Map Projections in Table IX of "Hints to Travellers." True bearings were always plotted in, allowance being made for compass variation according to figures given above.

Some of this material will fit on to 1/250,000 sheets already published by the Sudan Government Survey Department, but Camps 27-45 inclusive covered ground for which sheets on this scale have not yet been issued.

LARGE SCALE MAP OF NUKHEILA OASIS.

In view of the size of this Oasis and its political importance as a base for raiding parties and the scanty knowledge of it which exists, a sketch map of it was made on a scale of one inch to the mile, showing the palm-groves, lake, vegetation, villages, etc. The vegetation area is, roughly, 50 square miles, and we were naturally unable in a week to make an exact survey, but we wheeled a rough base of a mile, and by numerous bearings and trigonometrical heights obtained enough data for a rough sketch map, which may later prove a useful framework for

a more accurate map. Dr. Ball's accurate co-ordinates for his two camps in the Oasis, together with his levels of the lake, proved a valuable foundation from which to work.

A rough sketch-plan of the Lake at Nukheila on a scale of 25 inches to one mile was also made showing the vegetation surrounding it and the soundings we made. It has no value, unless as a record of the state of the lake in case the lake is liable to shrinkage or overflow.

8. THE DARB EL ARBAIN.

On the Selima 1/250,000 Sheet, 34-L., the Darb el Arbain is shown as running West-South-west of Selima for about 20 miles on a bearing of 245° , whereas at the point where we struck it, about $12\frac{1}{2}$ miles from the Oasis, it was running almost due North and South, and the true bearing to Selima from the point two miles or so further North, whence Shaw saw the palms, was 15° . The road may, of course, bend again to the West South of our crossing, and probably does so, but we could not verify this. The discrepancy with the map may be explained by the fact that Capt. Hodgson, on whose time and compass traverse of 1903 the map of this part of the road is presumably based, did not follow the Arbain road from Bir Natrun to Selima throughout, but kept to the West in order to hit the track from Terfawi; at mile $228\frac{1}{2}$ from J. Kashafa he "left the regular track to Selima and got among conical hills. The correct and easy track lies to the East . . . At mile 288, halted on meeting the track from Terfawi; at mile 289 changed direction sharply and dropped down on Selima at direction 115° to 125° ."

Now the French 1/2 M. map of Africa (region orientale—feuille 21), 1896, shows the Arbain road running into Selima on a bearing of 14° for the last 15 miles, Southwards it lies more North-west and South-west. The line of the road is apparently based on the route reports and/or maps of M. Poncet (1698), Père Krump (1701), M. le Noir du Roule (1704), W. G. Browne (1793 and 1796), and Sh. Mohd. El Tunki (1804). Browne was probably the only one of these travellers to take astronomical observations. He mentions "an artificial horizon" and an observation of occultation of Jupiter's satellites. His results were sometimes fair and sometimes bad as regard latitude, but his longitude of Selima is $1^{\circ} 55'$ too far East, and of Bir Malha (Bir Natrun), $2^{\circ} 20'$ too far East. Of course, all these travellers' reports are vague and unsatisfying, but this

early siting of the exit of the Arbain road from Selima is a curious confirmation of its line as seen by us.

It is obvious, however, that in places where the road is obscured by blown sand, or otherwise faint, more than one track was taken. Browne's guide lost the way between Selima and Lagia, although some men of the caravan had traversed the Darb El Arbain a dozen times. Between Sh. Mohd. El Tunsi (1804) and Capt. Hodgson (1903), the only travellers on the Arbain road South of Selima were Lieut.-Col. Colvile and Lieut. Stuart Wortley, who made a reconnaissance from Assiût to Lagia in 1884, and it was after their reports and that of Capt. Hodgson that the road was given its present line.

APPENDIX II.

Notes on Barometric Height-Estimations made by
Messrs. Newbold & Shaw during a journey in the
South Libyan Desert, October to December, 1927.

By Dr. John Ball, O.B.E., Director of Desert Surveys, Egypt.

Two watch-size aneroids were used, one by Steward, of London, and the other by Yeats, of Dublin, both graduated in inches and reading to 1/50 in. Both instruments were compared with the mercurial station-barometer at El Obeid Hospital before starting, and with the mercurial barometer at the Halfa meteorological station on the return of the expedition. For the purpose of height-estimations on the march, pressures were read on both aneroids, and the air-temperature as given by a thermometer hung in the shade was simultaneously recorded.

COMPARISON OF ANEROIDS.

The comparisons with the El Obeid and Halfa station-barometers at the commencement and termination of the journey gave the following corrections to the aneroid-readings to bring them into agreement with the mercurial readings reduced to 0° C. and mean gravity :—

	Steward.	Yeats.
	in.	in.
At El Obeid, October 28th, 1927	—0·065	—0·160
At Halfa, December 29th, 1927, to January 3rd, 1928	+0·231	+0·494
Change in Correction	0·296	0·654

It is, however, recorded that on December 7th the Steward aneroid received a bad jolt and was trodden on by a camel. By comparison of the differences of the readings of the two aneroids at the observation next preceding, with those of the observation next following the accident, it may be inferred that the immediate effect of the accident was to increase the correction applicable to the Steward instrument by about 0·14 in. If we assume this change of correction to have remained permanent, 0·14 inch of the 0·296 inch total change in the correction of the Steward aneroid between the comparisons at El Obeid and Halfa may be accounted for by the accident it sustained, leaving only 0·156 inch to be otherwise accounted for. The Yeats aneroid, though not known to have suffered any accident, shows a much greater change during the journey; in fact, the difference between its corrections at the beginning and the end of the journey is so large as at once to suggest that its readings are valueless.

A comparison of the differences between the readings of the two instruments at the various camps shows a marked correlation to exist between air-temperature and the difference of the readings of the two aneroids, the difference of readings tending to be high with low temperature, and *vice-versa*. The natural inference is that one of the aneroids is badly out of order as regards compensation for temperature, and suspicion is at once directed to the Yeats instrument by the great change in the correction between El Obeid and Halfa. This suspicion is confirmed by an examination of the readings of the two instruments as compared with the mercurial barometer at Halfa at various times between December 29th and January 3rd. For while the Steward aneroid shows practically no variation in its correction, whatever the temperature at the time of comparison, the correction of the Yeats instrument varies markedly with the temperature, diminishing progressively from 0·52 in. at temperature 73° F. to 0·44 in. at 84° F., as shown by the following table:—

Temperature (F.)	...	...	...	73°	79°	81°	84°
Number of Observations	...	...	...	4	6	2	1
Correction found, in.	...	...	...	0·52	0·49	0·47	0·44

I have therefore judged it advisable to reject all readings of the Yeats aneroid for height-estimation, and have only made use of its readings immediately before and after the accident to the Steward

instrument, in order to ascertain approximately the amount of change in the correction of the latter produced by the accident.

As regards the residual difference of 0·156 inch between corrections of the Steward aneroid observed at El Obeid and Halfa respectively, it was evidently possible that as the pressure under which the comparison was made at El Obeid was 27·96 inches, while that at Halfa averaged 29·44 inches, some or all of the difference found might be due to the correction varying with the pressure, rather than to a gradual change of zero. To settle this point, I requested Mr. Newbold to send the Steward aneroid to me at Cairo, so that I might have it tested for constancy of error under various pressures. On its arrival, the instrument was found to be reading too low by 0·9 inch, having evidently suffered derangement in transit. The setting of the pointer was adjusted by this amount so as to make the aneroid read nearly the same as the standard barometer of the Physical Department, and the aneroid was then tested against a mercurial column under various pressures with the following results:—

True Pressure.	Correction to reduce Steward Aneroid-readings to 0° C. and mean gravity.
inches	inches
29·86	—0·03
29·50	—0·11
29·00	—0·22
28·50	—0·30
28·00	—0·35
27·50	—0·41
27·00	—0·45

Interpolating for pressures of 27·96 and 29·44 inches (the pressures at the El Obeid and Halfa comparisons) we find corrections of —0·35 and —0·12 inch respectively, the difference between them being 0·23 inch in the same direction as the 0·156 inch found from the two field comparisons. Hence it would appear extremely likely that the whole of the residual 0·156 inch is due to [the dependence of the correction on pressure.

It is obvious that the working of even the Steward aneroid is far from being satisfactory, and considerable uncertainty must attach to

all the estimations of height made with it. In view, however, of the utter lack of any other height-determinations over a large part of the country traversed, I have thought it worth while to reduce the observations, on the assumptions that the correction required to the Steward aneroid varied proportionately with the pressure, from -0.965 inch at a reading of 27.96 inches (El Obeid) to -0.091 inch at 29.44 inches (Halfa), and that a further additive correction of 0.14 inch is to be applied to all readings taken after the accident to the instrument, to compensate for the effects of the fall.

CALCULATION OF HEIGHTS.

In calculating the altitudes of points in the route followed, the aneroid readings (corrected according to the above assumptions) were compared with the corresponding sea-level pressures as furnished by the Egyptian Meteorological Service, and the heights of the points were then computed by the aid of Jordan's tables of "Barometrische Höhenstufen."

The following is a list of the altitudes thus found:—

Place.	Number of Observations.	Altitude in Feet above Sea-level.	Altitude in Metres above Sea-level.
El Obeid Railway Station	1	1,850	564
Abu Sinun Village	1	2,014	614
Mazrub, near wells	1	1,968	600
Soderi, District Commissioner's House	1	1,870	570
Wadi el Melik at Abu Zaima	1	1,768	539
Hamra el Sheikh, Sheikh Ali el Tom's Ferig	1	2,133	650
Camp 3, Um Eidam Pool	1	2,208	673
Camp 4, Adha el Sabeina	1	2,162	659
Camp 5	2	2,169	661
Camp 6	1	2,198	670
Camp 7, near Zolat el Gemal	1	2,149	655
Camp 8	1	2,149	655
Camp 9, in Wadi Abu Atshan	1	2,188	667
Camp 10	1	2,208	673
Camp 11, Plain of J. Nagagir	1	2,192	668
Camp 12	1	2,054	626
Camp 13, Plain of El Jihaf	1	2,224	678
Camp 14	1	2,149	655
Camp 15, near Ras Tageru	1	2,205	672

Altitudes—continued.

Place.	Number of Observa- tions.	Altitude in Feet above Sea-level.	Altitude in Metres above Sea-level.
Camp 16	1	1,856	566
Camp 17, in Wadi Howa	1	1,749	533
Camp 18, Plain of J. Rahib	1	1,719	524
Camp 19, Wa'ra el Gilud	1	1,883	574
Camp 20	1	1,880	573
Camp 21, at Bir Milani in Natrun Oasis, 6 ft. above water in well	11	1,716	523
J. Kashafa, Summit Natrun Oasis	1	1,991	607
Camp 22, 150 yards N. of Bir Natrun, 6 ft. above water in well	3	1,627	496
Camp 23	2	1,857	566
Camp 24	3	1,896	578
Camp 25	1	1,768	539
Camp 26, summit of J. el Naddara, a low ridge overlooking Nukheila Oasis	3	1,896	578
Camp 27, Nukheila, 300 yards N.W. of Lake, about 15 ft. above lake surface	6	1,670	509
Camp 28, Wa'ra el Abid, Nukheila Oasis, 2 miles S.W. of lake	11	1,660	506
Camp 29	3	1,650	503
Camp 30	2	1,703	519
Camp 31, Wadi Hussein, about 20 ft. above water level	7	1,650	503
Camp 32, Wadi el Anag	3	1,690	515
Camp 33	3	1,880	573
Camp 34, at foot of Niseib el Hadud	3	2,146	654
Camp 35, on low ridge	3	2,073	632
Camp 36	3	2,024	617
Camp 37	3	1,870	570
Camp 38	3	1,886	575
Camp 39	3	1,896	578
Camp 40	2	1,699	518
Camp 41	3	1,555	474
Camp 42, at foot of Burg el Tiyyur	2	1,401	427
Camp 43	3	1,266	386
Camp 44	2	1,332	406
Camp 45	3	1,161	354
Camp 46	2	1,194	364
Camp 47	3	1,181	360
Camp 48	2	1,099	335
Camp 49	3	1,027	313
Camp 50, near J. Selima Atshan	2	1,099	335
Camp 51, Selima Oasis, 6 ft. above water in well	9	833	254
Camp 52	3	902	275
Camp 53	2	1,014	309
Camp 54	3	1,092	333
Camp 55	2	909	277
Camp 56, on W. bank of Nile, opposite Abri, about 25 ft. above Nile level, 22.12.27	5	682	208

DEGREE OF RELIABILITY OF THE HEIGHT-ESTIMATIONS.

The principal sources of inaccuracy in height-estimations are :—

1. Errors in the adopted sea-level pressures.
2. Errors in the recorded air-temperatures.
3. Errors in reading the indications of the aneroid.
4. Errors in the corrections applied to the aneroid-readings to convert them into true pressures.

The errors in the first three of these categories may be classed as observational errors, of which the effects will tend to be the smaller, the greater the number of observations taken at a place. The errors of the fourth category, on the other hand, are "instrumental" errors, whose effects will not be lessened by any increase in the number of observations.

The sea-level observations are considered by Mr. Sutton, the Director of the Egyptian Meteorological Service, to be probably correct with 0.5 mm., which corresponds to about 5 metres (16 feet) of height.

The recorded air-temperatures may be assumed, I think, to be correct within about 3° C., which corresponds on an average to about 1 per cent. of uncertainty in the height above sea-level. The error of a single reading of the aneroid-pointer is not likely to exceed half a division of the scale, *i.e.*, a hundredth of an inch, corresponding to about 3 metres (10 feet) of height.

Thus the maximum uncertainty of height arising from all "observational" errors taken together may be assumed to be about 16 metres (52 feet) for points where a single observation only was taken, and about $16/\sqrt{n}$ metres for points at which "n" observations were made. The actual "observational" errors may in general be expected to be distinctly smaller than these amounts, because it can seldom have happened that the errors from all the three sources simultaneously reached their maximum values with like signs.

The inaccuracies to which the height-estimations are liable in consequence of "instrumental" errors are more difficult to gauge, chiefly owing to the aneroids not having been tested at various pressures and temperatures before and immediately after the journey, and to the impossibility of accurately estimating the effects of the accident to the Steward instrument on its subsequent readings. That the "instrumental"

corrections which have been adopted for the calculations are not very greatly in error may, I think, be reasonably inferred from the fact that the height deduced for the lake-surface at Nukheila differs by less than 5 metres (16 feet) from that which I found for it by a series of very careful observations with well-controlled aneroids in 1925. The maximum uncertainties in the adopted "instrumental" corrections, possibly corresponding to 20 metres (66 feet) or more of height, lie in the last third of the journey (from Wadi el Anag to Abri), which was traversed after the accident to the Steward instrument.

Taking all the various sources of error and the number of observations at the different camps into account, it would seem likely that the heights obtained for Bir Milani and Nukheila may be relied on as being within 10 metres (33 feet) of the truth, and those for Bir Natrun and Selima within 20 metres (66 feet); while for other points on the route the height-estimations are probably correct within 30 metres (98 feet).

DISCUSSION OF THE RESULTS.

The outstanding results of the barometric observations—results which, it may be remarked, will not be sensibly affected by a liberal allowance being made for "instrumental" and other errors—are the comparatively small range of variation of level throughout the greater portion of the route and the somewhat high altitude of the ground traversed between Nukheila and Selima.

In the first 680 miles of the journey from El Obeid, the highest and lowest levels recorded, 673 metres (2,208 feet), and 496 metres (1,627 feet), differ by less than 180 metres (590 feet). The altitudes observed on the remaining 230 miles of the journey (to Abri) show that the low-lying area in which the wells of Shebb and Terfawi are situated is limited to the south by a tract of rising ground, which extends eastward in the neighbourhood of the parallel of 21° . Thus the 500-metre contour, which near the Egypt-Sudan boundary lies to the west of longitude 27° , does not continue so far in a southerly direction as I provisionally drew it on the relief map of the Libyan Desert published in my paper in the Royal Geographical Society's Journal for July, 1927, but turns somewhat to the east before reaching latitude $20^{\circ} 40'$. The 400-metre contour similarly turns eastward for nearly a degree of longitude in about

latitude 21° , and the 300-metre contour extends still further eastwards on about the same parallel, reaching, in fact, to within 25 miles or so of the Nile. The exact courses of the contours in the unexplored tract (100 miles wide) which lies between Messrs. Newbold and Shaw's track and that of Prince Kemal el Din's expedition of 1925 must still remain uncertain; but there can be no doubt that somewhere within this tract the contours make a decided sweep to the eastward, indicating a gradual rise in the level of the country from Shebb towards Selima, Lagia and Bir Natrun, with possibly a less gradual rise on either side of a line passing through these four places.

Particular interest attaches to the levels found for the water-sources visited in the course of the expedition. The level of 504 metres (1,653 feet) found for the lake at Nukheila may be taken as confirming the figure of 509 metres (1,670 feet) which I found for it in 1925, the small difference being easily explainable by the uncertainties in the corrections of the Steward instrument. The level found for Selima, 254 metres (833 feet), is fairly close to the 270 metres (886 feet), which I ventured to predict for it last year on the basis of my hypothesis of underground water distribution. The values found for Bir Milani and Bir Natrun, 523 metres (1,715 feet), and 496 metres (1,627 feet) respectively, also agree satisfactorily with that hypothesis, for these wells lie very close to the 500-metre static water-contour on the map accompanying my R.G.S. paper; the rather large apparent difference of level of the two wells, which are only a few miles from each other, is possibly, in part, due to observational errors at Bir Natrun, where only three barometer readings were made against eleven at Bir Milani.

APPENDIX III.

Meteorological Notes.

By W. B. K. Shaw.

The following list of maxima and minima Fahrenheit thermometer readings ranges from 3.11.1927 to 28.12.1927 and covers the journey from Soderi, in Northern Kordofan, to Halfa, on the Nile. It should

furnish a fairly accurate statement of the temperatures likely to be encountered in the South Libyan Desert at this time of year, but should not be regarded as the absolutely correct maxima and minima as, when marching, we often left camp at an hour before that at which the absolute maxima and minima may, respectively, have been attained. It is unlikely, however, that they err by more than 2-3 degrees. They are in all cases shade temperatures.

The extremes of temperature are as follows :—

Largest daily variation, 4.12.1927	...	...	79° to 29°, <i>i.e.</i> , 50° difference.
Smallest daily variation, 18.12.1927	...	...	76° to 58°, <i>i.e.</i> , 18° difference.
Highest maximum, 97°	...	...	Lowest maximum ... 71°
Highest minimum, 72°	...	...	Lowest minimum ... 29°

On only one occasion, the night of 4.12.1927, in Wadi Hussein, North-east of the Nukheila depression, did the temperature drop below freezing point.¹

The wind blew almost every day from the same direction, about East North-east. On the few days when it left this quarter it was noticeably hotter. From about the beginning of December the wind usually got up at dawn and dropped at sunset. In strength it was on most days a fresh breeze, strong enough to need the tent door closed against it. On only two days did it blow with sufficient force to create a moderate sandstorm, and we did not encounter anything in any way approaching a real "habub." It was noticeable that the lowest temperatures were experienced on windless nights, though one actually felt colder on those on which the wind blew. Also that lower temperatures were recorded at low-lying camps in depression such as Um Eidam, Natrun and Nukheila Oases, than when crossing the higher desert between them.

No dew was noticed, such as that experienced by Bimb. Comyn South-west of Selima in 1906.

From Nukheila onwards there were often a few light clouds in the sky, but only on one day, at Selima, were these sufficiently heavy to prevent astronomical observations with the theodolite.

¹ Frost is not unknown at Halfa. Various instances of low temperatures are recorded. On p. 215 of Dr. Hume's "Geology of Egypt," 1925, -4.4° C. or 27° F., was recorded in 1908, West of Kharga, on the desert plateau, and at Giza, on December 12th, 1905. This is 2° Fabr. lower than our lowest temperature, but is nearly 400 miles further North.

FAHRENHEIT THERMOMETER SHADE TEMPERATURES.

Date.	Place.	Max.	Min.
3.11.1927 ...	Soderi	97	72
4.11.1927 ...	Soderi and nameless camp	96	72
5.11.1927 ...	Um Kherwa and nameless camp	88	59
6.11.1927 ...	Wadi el Malik and nameless camp	87	60
7.11.1927 ...	Camp 1 (Hamra el Sheikh)	84	54
8.11.1927 ...	Camps 1 and 2	83	59
9.11.1927 ...	Camp 3 (Um Eidam depression)	85	40
10.11.1927 ...	Camp 4 (Adha el Sobeina) and Camp 5	80	48
11.11.1927 ...	Camp 5	80	44
12.11.1927 ...	Camps 5 and 6	79	44
13.11.1927 ...	Camps 7 and 8	80	49
14.11.1927 ...	Camps 9 and 10	85	50
15.11.1927 ...	Camps 11 and 12	89	50
16.11.1927 ...	Camps 13 and 14	90	50
17.11.1927 ...	Camps 15 and 16	92	62
18.11.1927 ...	Camps 17 and 18	92	60
19.11.1927 ...	Camps 19 and 20	92	65
20.11.1927 ...	Camp 21 (Bir Milani)	85	63
21.11.1927 ...	Camp 21	85	63
22.11.1927 ...	Camp 21	85	60
23.11.1927 ...	Camp 21	87	58
24.11.1927 ...	Camps 21 and 22 (Bir Natrun)	85	60
25.11.1927 ...	Camps 23 and 24	84	51
26.11.1927 ...	Camp 26	—	56
27.11.1927 ...	Camp 27 (near Nukheila Lake)	—	49
28.11.1927 ...	Camp 27	88	46
29.11.1927 ...	Camp 28 (Wa'ara el Abid)	84	50
30.11.1927 ...	Camp 28	81	46
1.12.1927 ...	Camp 28	75	47
2.12.1927 ...	Camp 28	82	47
3.12.1927 ...	Camps 28 and 29	82	53
4.12.1927 ...	Camps 30 and 31 (Wadi Hussein)	79	29
5.12.1927 ...	Camp 31	80	34
6.12.1927 ...	Camp 31	80	37
7.12.1927 ...	Camps 32 and 33	77	48
8.12.1927 ...	Camps 34 and 35	85	60
9.12.1927 ...	Camps 36 and 37	88	58
10.12.1927 ...	Camps 38 and 39	93	56
11.12.1927 ...	Camps 40 and 41	75	47
12.12.1927 ...	Camps 42 and 43	74	40
13.12.1927 ...	Camps 44 and 45	71	42
14.12.1927 ...	Camps 46 and 47	73	45
15.12.1927 ...	Camps 48 and 49	80	42
16.12.1927 ...	Camps 50 and 51 (Selima)	85	50 (?)
17.12.1927 ...	Camp 51	89	62
18.12.1927 ...	Camp 51	76	58
19.12.1927 ...	Camps 51 and 52	73	47
20.12.1927 ...	Camps 53 and 54	73	51
21.12.1927 ...	Camps 55 and 56 (Nile, opposite Abri)	75	42
22.12.1927 ...	Camp 56	78	46

Date.	Place.	Max.	Min.
23.12.1927 ...	Camp 56	76	44
24.12.1927 ...	Camps 57 and 58	71	44
25.12.1927 ...	Camps 59 and 60	73	38
26.12.1927 ...	Camps 61 and 62	74	41
27.12.1927 ...	Camps 63 and 64	—	59
28.12.1927 ...	Camps 65 and 66 (Nile at Halfa)	83	60

APPENDIX IV.

**Notes on Rocks collected by Messrs. Newbold and Shaw during
a journey through Bir Natrun, Nukheila to Selima.**

By Mr. G. W. Grabham, Sudan Government Geologist.

The collection submitted includes over forty specimens now registered under numbers 4312-4353, also a sample of water from Nukheila Lake. They were accompanied by very full notes made by Mr. Shaw, and these have been freely drawn on in the following remarks:—

Most of the specimens are typical of the Nubian Sandstone formation, the exceptions are a silicified igneous rock, a dolerite and deposits associated with lakes in depressions.

The sample of silicified igneous rock is from a hill at Lat. $16^{\circ} 20'$, Long. $27^{\circ} 26'$. It is reported to be one of a series of isolated hills in line of 75 true bearing running eastwards from near J. Tageru. There are six or eight of these isolated reefs, stretching from, approximately, Long. $27^{\circ} 20'$ to Long. $27^{\circ} 32'$. The descriptions suggest the presence of a ridge of hard crystalline rock which rises from the floor on which the Nubian Sandstone was deposited. If this is the case, the Nubian Sandstone must be, relatively, thin in this neighbourhood.

Several of the Nubian Sandstone specimens have calcareous cements. These were obtained between Lat. $15^{\circ} 42'$ and Lat. $17^{\circ} 02'$; while the cements in the more northern parts of the route are typically siliceous. Calcareous rocks were previously known to occur in the Nubian Sandstone series at Halfa.

A wind-worn fragment of silicified wood (4352), presumably originally derived from the Nubian Sandstone series and collected at Selima is the

only fossil of this age among the specimens. Similar specimens from the same locality were obtained some years ago by Mr. Leach and are, I understand, dealt with in a paper in *Sudan Notes and Records*, Vol. IX, No. 2 (December, 1926).

The markings on Sample 44 (4341) from Lat. $19^{\circ} 15'$, Long. $26^{\circ} 30'$, are dendritic forms of the ores of iron and, perhaps, manganese. They are not organic.

A specimen of olivine dolerite represents the few outcrops of this black rock occurring in Lat. $18^{\circ} 35'$, Long. $26^{\circ} 28'$ (near Camp 35). The rock is fairly coarse grained and even textured. It is almost certainly intrusive in the Sandstone and does not represent a volcanic outpouring. The account of its occurrence suggests that the intrusions are in the form of dikes and not sills or horizontal sheets. Closely allied types of basalt were previously known as intrusions in the Nubian Sandstone in Berber and Dongola Provinces, but this discovery of Messrs. Newbold and Shaw is certainly of interest.

A specimen of light grey mudstone (4326) was collected from the neighbourhood of Bir Natrun. It is soft and has contraction cavities as well as cylindrical holes, perhaps left by worms or similar animals and certainly represents a relatively recent lake deposit. Such deposits occur in the Gab and in some Egyptian oases, showing that sheets of water formerly existed. The material from which this deposit at Bir Natrun is formed must all be derived from the rocks of the Nubian Sandstone series. The coarser material would be held near the shores, while in the centre would accumulate dust derived from the mudstones. The lake deposits strongly resemble the mudstones of the Nubian Sandstone series, but differ in being softer and less consolidated. The sample was examined for diatoms, but none were found.

The notes describe the mudstone as occurring all over the Natrun Oases—just as would be the case with a lake deposit. The notes also remark that the mudstone underlies the sandstone of the neighbouring regions. This cannot be if the mudstone has been correctly determined to represent a lake deposit. There may be other strata of mudstone interstratified in the Nubian Sandstone series, but the mudstone of the Nubian Sandstone series is impermeable, and if it underlaid the floor of the Oasis it would prevent water from reaching the surface, and there

would be no springs. Unless the sandstone has been seen to rest on the mudstone in this area, it is safer to conclude that the mudstone is a lake deposit covering the floor of the depression.

The gypsum (selenite) crystals (4323) from J. Kashafa also tend to suggest the former occurrence of lakes or springs in this area.

The calcareous pipes from Selima are almost certainly casts of the stems of reeds that formerly grew in a marsh. Specimens previously received have shown definite vegetable structures preserved on the inner surfaces of these pipes. Here we have evidence of a former greater extent of marshes.

The striking feature of the collection is evidence of weathering under humid tropical conditions such as result in the formation of laterite. Many of the specimens are stained and hardened with iron oxide, and I think the silicification which has resulted in the formation of what are practically quartzites has arisen under similar conditions of climate. There are several ironstone concretions, and a specimen (4331) from Lat. $18^{\circ} 50'$, Long. $26^{\circ} 22'$ seems to show definite segregation of ferric and, perhaps, aluminous constituents under lateritic conditions of climate. Laterite is supposed to form in climates where there are seasons of very heavy rains separated by very dry seasons.

This evidence of a more humid climate is consonant with the existence of lakes and marshes and also with the greater extension of those that still survive. Both these probably involved a great deal more humidity than occurs now; in fact, a climate approximating to that of to-day in the Bahr el Ghazal or Uganda. It may not be necessary to suppose that man occupied the region during these more humid times. A relatively small amelioration of climate would permit man to range over the area and graze his flocks at any rate during certain seasons.

A fragment of a stone axehead (4353) was included in the collection for the purpose of determining the nature of the material of which it is composed. This proves to be a porphyrite with very few phenocrysts. The collection of implements brought by Mr. Newbold from Wadi Hawa in 1923 and deposited in the antiquities' collection also has been studied. All of them are igneous rock. One not included in Plate IV of *Sudan Notes and Records*, Vol. VII, No. 1, is of a porphyrite with fairly numerous phenocrysts. Two or three of the figured ones are of rock similar to the

fragment now submitted, and two of the remainder might be formed of dolerite, but more detailed study is required to confirm this. Dolerite is more brittle than porphyrite and, therefore, less suitable for stone implements. There remain some of rock similar to the specimen (4353), but with the small difference that the phenocrysts are absent. It cannot be called a porphyrite. It then becomes a "malchite" or micro diorite, perhaps "microdiorite" is the simpler term and would cover most of the collection except the obviously porphyritic types. These should be termed porphyrites.

It is impossible at present to say where the material was derived from. It is a fairly common type associated with igneous rocks.

The water from Nukheila Lake has been analysed, and the Government Chemist remarks that the results agree with the following rational analysis:—

Sodium Chloride (NaCl)	...	...	10.09 grams per 100 ccs. of water.
Sodium Sulphate (Na ₂ SO ₄)	...	...	2.88 grams per 100 ccs. of water.
Sodium Carbonate (Na ₂ CO ₃)	...	...	2.46 grams per 100 ccs. of water.
TOTAL SOLIDS	...	...	<u>15.43</u>

He remarks that the absence of calcium and magnesium is unusual. The potassium content was not estimated, but can only be small.

A sample of rock salt from Bir Natrun was also submitted for analysis (4325).

Slices are to be prepared from the samples of the silicified igneous rock, the dolerite, the stone axe and from some examples of the hardened sandstone. These results will not be available for some time.

The collection and notes show that the greater part of the area is underlain by rocks of the Nubian Sandstone series. On the Geological Map, the positions to be indicated are: the ridge of igneous rock, the intrusions of dolerite, and the areas of lake deposits in a country of Nubian Sandstone.

A list of the samples is appended.

Regd. No.	Lat.	Long.	Map Sheet.	Remarks.
4312 ...	15° 24'	27° 46'	54 C	Ironstone.
4313 ...	15° 42'	27° 43'	54 C	Pale buff-coloured sandstone with partly calcareous cement.
4314 ...	16° 20'	27° 26'	44 O	Silicified igneous rock. Granite?
4315 ...	16° 37'	27° 17'	44 O	White sandstone with siliceous cement stained red on surface. Specimen wind-worn.
4316 ...	16° 37½'	27° 17'	44 O	White sandstone with calcareous cement.
4317 ...	16° 41'	27° 16'	44 O	White sandstone with calcareous cement.
4318 ...	16° 48'	27° 14'	44 O	Two specimens: one silcrete sandstone; the other one has red ochreous cement.
4319 ...	17° 02'	27° 09'	44 K	Two specimens: (a) Fractured specimen, fine grained white sandstone with brown surface skin. (b) Ironstone.
4320 ...	17° 02½'	27° 05'	44 K	White sandstone flakes with calcareous cement.
4321 ...	17° 08'	27° 05'	44 K	(a) White mudstone. (b) Red mudstone. (c) Pebble of vein quartz.
4322 ...	17° 39'	26° 54'	44 J	Hard, coarse-grained red sandstone.
4323 ...	18° 11'	26° 45'	44 F	Buff to dark brown ferricrete sandstone, fine-grained, probably representing a crust on sandstone.
4324 ...	18° 11'	26° 45'	44 F	Selenite or crystallised gypsum. Possibly formed on shores of former lake or spring.
4325 ...	18° 11'	26° 43'	44 F	Rock salt. Natron.
4326 ...	18° 12'	26° 43'	44 F	Grey mudstone, examined for diatoms, but not found. It is a lake deposit, has cavities.
4327 ...	18° 11'	26° 43'	44 F	Ferricrete sandstone or ironstone, representing stones found lying about surface of salt pan.
4328 ...	18° 21'	26° 37'	44 F	Coarse-grained, light buff-coloured sandstone from undulating desert.
4329 ...	18° 24'	26° 34'	44 F	Hard medium-grained buff-coloured silcrete sandstone. Almost a quartzite.
4330 ...	18° 35'	26° 28'	44 F	Olivine dolerite, presumably intrusive in the Nubian sandstone.
4331 ...	18° 50'	26° 22'	44 F	Mudstone with some sand with red ochreous concretionary deposit—presumably local on surface. It is a lateritic type, evidence of a former tropical climate.
4332 ...	18° 50'	26° 22'	44 F	White sandy mudstone. This type frequently outcrops between here and Bir Natrun; softens in water.
4333 ...	19° 02'	26° 19'	44 B	White sandstone, typical of the country rock.
4334 ...	19° 02'	26° 19'	44 B	Ironstone concretion from the Nubian sandstone with buff-coloured core.
4335 ...	19° 02'	26° 19'	44 B	Ferricrete sandstone forming loose "sheet iron"-like plate on the surface of Finger Hill.

List of samples—*continued*.

Regd. No.	Lat.	Long.	Map Sheet.	Remarks.
4336 ...	19° 02'	26° 19'	44 B	Light yellow sandstone with brown stains.
4337 ...	19° 02'	26° 19'	44 B	Red fine-grained sandstone.
4338 ...	19° 02'	26° 19'	44 B	Fragment of vein quartz.
4339 ...	19° 02'	26° 19'	44 B	Laminated mudstone, light buff-coloured, with layers of sand.
4340 ...	19° 15'	26° 30'	44 B	Fine-grained red sandstone with white spherical calcareous concretions about size of large peas.
4341 ...	19° 15'	26° 30'	44 B	Dendritic markings on pink laminated mudstone. Not organic.
4342 ...	19° 27'	26° 36'	44 B	Light red, soft, coarse-grained gravelly sandstone.
4343 ...	19° 27'	26° 36'	44 B	Wind-worn fragment of a concretionary banded mass of hæmatite. Ferric Oxide.
4344 ...	20° 17'	27° 01'	34 O	Two specimens: (a) Hard fine-grained grey sandstone; (b) Red medium-grained silcrete sandstone.
4345 ...	20° 36'	27° 17'	34 O	Hard grey, fine-grained, platy silcrete sandstone—a quartzite.
4346 ...	20° 56'	27° 40'	34 O	Two specimens: (a) Coarse-grained, soft white sandstone; (b) Medium-grained white silcrete sandstone.
4347 ...	21° 03'	28° 04'	34 K	Medium-grained ferricrete sandstone.
4348 ...	21° 06'	28° 30'	34 L	White silcrete sandstone, fine-grained.
4349 ...	21° 10'	28° 45'	34 L	Porous, medium-grained, pink sandstone.
4350 ...	21° 22'	29° 20'	34 L	Calcareous casts of stems of vegetation reeds (?)
4351 ...	21° 22'	29° 20'	34 L	Crystallised salt.
4352 ...	21° 22'	29° 20'	34 L	Wind-worn fragment of fossil wood.
4353 ...	21° 25'	26° 55'	44 J	Compact porphyrite with few phenocrysts, from Wadi Hawa.

Sample 4325 appears to be "Natron." The Government Chemist (Sample 32,626, date 11.2.1928) reports the result of the analysis as follows:—

Soluble Carbonate (CO ₃) ...	... 28.1%
Soluble Bicarbonate (HCO ₃) ...	... 19.9%
Chloride ...	... Trace only.
Sulphate ...	... Nil.
Nitrate ...	... Nil.
Insoluble Matter ...	... Small quantity.
Water ...	... Not estimated.

Presuming the alkali metal to be all sodium, the above analysis then gives:—

Sodium Carbonate ...	... 49.6%
Sodium Bicarbonate ...	... 27.4%

from which he concludes that the substance is, presumably, "Natron."

APPENDIX V.

Botanical.

By W. B. K. Shaw.

The notes in this Appendix are intended to describe the various types of vegetation encountered along the route followed, and also that of the three oases visited. In the description, the native names of plants have been used. Their botanical names will be found below.

From El Obeid to Mazrub typical Kordofan gum country is traversed, the tree species being *hashab*, *sereh*, *habil*, *heglig*, *mokheit*, *ghobeish*, with underneath a thick growth of *heskanit* and *sumeim* grass covering the loose sandy soil.

Near Mazrub the soil is less sandy and the surface harder, and the main species *kittir*, *gufal*, *kurmut* and *inderab*. Nearing Soderi, the sand comes in again accompanied by much *merakh*.

The country passed through between Soderi and Hamra el Sheikh alternates between undulating *goz* (soft sand) type and a surface of hard sand. Tree species are *gufal*, *kittir*, *mokheit*, *sereh*, *inderab*, *heglig* with much *heskanit* grass.

From Hamra our route turned northwards and the country affords an excellent example of the progressive approach to complete desert conditions. The bush becomes gradually more open, Lat. $15^{\circ} 30'$ North being, on the route followed, about the northern limit of country uniformly covered with even thin scrub. The tree species noted were *gufal*, *mokheit*, *laot*, *kittir*, *sereh*, *tundub*, a few *merakh*, small *kurmut*, *heglig*, *inderab* along wadis, *seyal*, large in depressions such as Adha el Sabeina, one *sidr* between Camps 7 and 8.

The northernmost *tebelidi* was seen between Hamra and Um Eidam, where around the pool are many *sunt* trees.

The ground surface is mainly hard, reddish sand with rocky outcrops and gravel patches and carries the following grasses:—*Heskanit*, *mahareib*, *tomam* along Wadis and water runnels, *rihan*, *begheil*, *heskanit*, *lera*.

North of Lat. $15^{\circ} 30'$ the vegetation, save for a few *tundub* and *seyal*, is mostly confined to the Wadis and small khors. In Wadi Abu Atshan there is good grazing of *seyal*, *shaw*, *tundub*, *merakh*, *inderab*, and *tomam* grass. One *haraz* tree was seen three miles South of this Wadi.

Camp 11, on the morning of November 15th, was the first at which our camels had no grazing at all; however, they were lucky in finding at Camp 12 that evening the only piece of real "*gizzu*" grazing we met with, composed of *nissa* and *dirmi* grass.

Abu Atshan, Camp 9, was the last Wadi in which we found good grazing until the Wadi Howa was reached (Camp 17), and the camels, save for the "*gizzu*" at Camp 12, fared poorly on two *tundub* trees at Camp 14, and some green *had* grass at Camp 15. In the Wadi Howa is much *shau*, a few *seyal*, *tundub*, and *had* and *agul* grass.

Between the Wadi Howa and Bir Natrun there is good grazing of *sellim*, *seyal*, *tundub* and *had* in Wa'ra el Gilud.

THE NATRUN OASIS.

Trees are:—Date palms at Bir Sultan and Bir Nakhla only, *sellim*, a few *seyal* and *tarfa*. Grasses: *Ekhliis*, *had*, *tomam*.

The best grazing is at Bir Milani, where *sellim* abounds. Here the *sellim* situated on the lowest levels is dead or dying, apparently from excessive moisture or, perhaps, from the salt on the surface soil; while that raised a few feet on low sand mounds is flourishing.

Between Natrun and Nukheila, the sole vegetation seen were a few isolated *tundub* trees over the first half of the journey and a patch of *had*, *nissa* and *agul* grass at Camp 25.

NUKHEILA OASIS.

The predominant tree is the date palm, of which there must be 800–1,000 mature specimens. These are scattered all over the Oasis, growing also on the almost bare sandstone on the South-west side of the lake and right on the water's edge. The Howawir maintain that the number of palms near the lake has greatly decreased since 1916.

There are a number of *sellim* and a few *seyal* trees, particularly in Wa'ra el Abid, where the latter reach a height of 40 feet and a diameter of 3 feet. There are a few *tarfa* bushes.

Of grasses *had* abounds, and provides excellent grazing, especially on the South edge of the Oasis where one enters from Bir Natrun. *Halfa* is plentiful, and there is a thick growth of reeds (*bezam*) round the lake edge. Other grasses are *agul*, *ekhliis* and *kerag*.

At Camp 20 were a few *tundub* trees and some *had* and *ekhliis* grass.

Wadi Hussein, Camp 31, contains two clumps of date palms and much *had* and *ekhlis*; while at Wadi el Anag, Camp 32, are a few *seyal* and *tundub*, with *had*, *agul* and *ekhlis*.

Between Wadi el Anag and Selima the vegetation noted was so meagre that each individual patch can be recorded:—

- (1) In a depression between Camps 33 and 34 two *tundubs* and a little *gau*, *ekhril* and *agul* grass.
- (2) Camp 35, a fair patch of green *had* and *ekhril*.
- (3) The same at Camp 36.
- (4) Camp 38, a little *had*.

From here on to Selima, 6½ days' travelling, we saw no sign of plant life, except for a few dozen age-old tufts of *nissa* grass, half buried in the sand, on the morning of December 12th.

It was noticeable on the desert between Natrun and Selima that in the few places where vegetation occurred it was usually on a low hill or rocky ridge. Presumably, the vegetation which, apart from that of the oases, must depend on the very occasional rains that fall in this region, clings to the higher ground which may attract a little more rain.

SELIMA OASIS.

The vegetation, *inter alia*, of Selima has been described by Mr. Leach in *Sudan Notes and Records*, Vol. IX, No. 2. The Date Palm is the predominant tree. There are also a number of Dom Palms, one very large *seyal*, *tarja*, much *halfa* grass; also *ekhlis*, *bezam* and *dabbas*, and another reed of the family Cyperaceæ not yet identified. For camels the grazing is fair.

Between Selima and the Nile there is no vegetation of any kind.

The following lists give the botanical names of the species referred to by their vernacular names above.

For the identification of 18 of the 21 specimens collected we are indebted to Mr. Massey, Government Botanist. Three are as yet undetermined. Specimens of species known beyond doubt were not collected.

TREES.

- | | | | |
|--------------------|-----|-----|--|
| 1. Date Palm | ... | ... | <i>Phoenix dactylifera</i> . Linn. |
| 2. Dom Palm | ... | ... | <i>Hyphæne thebaica</i> . Mart. |
| 3. <i>Ghobeish</i> | ... | ... | <i>Guiera senegalensis</i> . Linn. |
| 4. <i>Gufal</i> | ... | ... | (?) <i>Commiphora africana</i> , Engl. |

TREES—continued.

5.	Habil	...	...	Combretum sp.
6.	Hashab	...	...	Acacia Verek. <i>Guill. et Perr.</i>
7.	Heglig	...	...	Balanites ægyptiaca. <i>Del.</i>
8.	Inderab	...	...	Cordia Rothii. <i>Roem et Schultes.</i>
9.	Kittir	...	...	Acacia mellifera. <i>Benth.</i>
10.	Kurmut	...	...	Cadaba rotundifolia. <i>Forsk.</i>
11.	Laot	...	...	Acacia nubica. <i>Benth.</i>
12.	Merakh	...	...	Leptadenia Spartium. <i>Wight.</i>
13.	Mokheit	...	...	Boscia octandra. <i>Hochst.</i>
14.	Sellim	...	...	Acacia Ehrenbergiana. <i>Hayne.</i>
15.	Sereh	...	...	Maerua rigida. <i>R. Br.</i>
16.	Seyal	...	...	Acacia spirocarpa. <i>Hochst.</i>
17.	Shau or Arah	...	...	Salvadora persica. <i>Garcin.</i>
18.	Sidr	...	...	Zizyphus sp.
19.	Sunt	...	...	Acacia arabica. <i>Willd.</i>
20.	Tarfa or Ithil	...	...	Tamarix sp.
21.	Tundub	...	...	Capparis aphylla. <i>Roth.</i>

GRASSES AND HERBS.

22.	Agul	...	...	Fagonia cretica. <i>Linn.</i>
23.	Bezam	...	...	Saccharum spontaneum. <i>Linn.</i>
24.	Begheil	...	...	Blepharis linariaefolia. <i>Pers.</i>
25.	Dabbas	...	...	Imperata cylindrica. <i>Brand var.</i> <i>J. Koenigii, Durand and Schinz.</i>
26.	Dirmi	...	...	Indigofera arenaria. <i>A. Rich.</i>
27.	Ehhlis	...	...	Unidentified.
28.	Ehhrit	...	...	Salsola vermiculata. <i>Linn.</i>
29.	Had	...	...	Cornulaca monacantha. <i>Del.</i>
30.	Halfa	...	...	Desmostachya cynosuroides. <i>Stapf.</i>
31.	Heshanit	...	...	Cenchrus catharticus. <i>Del.</i>
32.	Kerag	...	...	Alhagi maurorum. <i>Desv.</i>
33.	Lera	...	...	Aerua tomentosa. <i>Forsk.</i>
34.	Mahareib	...	...	Cymbopogon sp. near proximus. <i>Choiv.</i>
35.	Nissa	...	...	Aristida ciliata. <i>Desf.</i>
36.	Rabel	...	...	Pulicaria crispa. <i>Benth.</i>
37.	Rihan	...	...	Geigeria alata. <i>Benth & Hook.</i>
38.	Sumeim	...	...	Aristida Sieberiana. <i>Trin.</i>
39.	Tenun	...	...	Crozophora plicata. <i>A. Juss.</i>
40.	Tomam	...	...	Panicum turgidum. <i>Forsk.</i>
41.	—	...	...	Abutilon graveolens. <i>Wight and Arnott.</i>

The following are a few corrections to the list of grasses and trees given by Mr. Newbold in his article "A Desert Odyssey of a Thousand Miles," published in *Sudan Notes and Records*, Vol. VII, No. 1, page 85.

The identifications made in this article were from notes and memory only; no specimens were collected.

The reader is referred to the above-mentioned account for a description of the various plants and their suitability or otherwise for grazing.

- P. 86. Tamarisk, *tarfa* is not *sterculia cinerea* but *Tamarix* sp.
Inderab is *Cordia Rothii* not *C. abyssinica*.
Hamra (*Khaya senegalensis*) is a mistake. *Khaya* is not found in the N. Sudan.
- P. 88. *Dirmi* is *Indigofera arenaria* not *Zygophyllum simplex*.
Agul is *Fagonia cretica*.
- P. 90. *Mahareib* is *Cymbopogon* sp.

The native names vary from tribe to tribe. In Mr. Newbold's expedition of 1923 he got mainly Kababish names; in 1927 we took them from the Howawir.

APPENDIX VI.

A Preliminary Report on the Natural History Specimens collected by Messrs. D. Newbold and W. B. K. Shaw in the South Libyan Desert.

By Mr. H. W. Bedford, Entomological Section, Wellcome Tropical Research Laboratories, Khartoum.

From an economic point of view the journey accomplished by Messrs. Newbold and Shaw was of special interest, in that they were able to supply us with certain information concerning locusts, which we were particularly desirous of obtaining. Briefly, their observations showed that, although the Migratory Locust had during its migrations passed through vast tracts of the Libyan Desert and was still present in small and scattered numbers as late as December, there was little or no chance of its being able to carry on breeding there during the winter months, nor was there a likelihood of many being able to survive in those regions until the next rainy season. This is an important fact to establish. Of the locusts brought back none were sexually mature, and they consisted, as far as one could surmise, of stragglers which had been left behind during the migratory period of September-October.

Previously it had been thought that there might be some possibility of locusts being able to survive in sufficient numbers so as to breed up as soon as conditions became favourable and thus to form nuclei of swarms which spread into the cultivated areas. This theory, as far as the Libyan Desert is concerned, seems now far from true.

(N.B.—But locusts were reported breeding at Bir Terfawi by the Egyptian authorities in January, 1928.—W. B. K. S.)

The specimens of insects and scorpions submitted for determination have, as far as possible, been worked out; but as the majority consisted of species new to our collection, these have been sent to the Bureau of Entomology in London for identification. A preliminary list of species is given below:—

1. The locusts collected were all the Migratory Locust (*Schistocerca migratoria*), in the red stage, i.e., sexually immature.

The following information on locusts was collected by Mr. Shaw:—

No particular note was taken of the existence or otherwise of locusts before Nukheila (Lat. $19^{\circ} 05'$, Long. $26^{\circ} 18'$), but they were not observed in sufficient numbers to be worthy of comment or to be considered in the nature of a swarm.

At Nukheila, locusts were present in the oasis in small numbers. Between Nukheila and Selima a few straggling locusts were met with in three localities only, namely, at Lat. $19^{\circ} 35'$, Long. $26^{\circ} 38'$, on two *tundub* bushes, on which the locusts were feeding; at Lat. $20^{\circ} 56'$, Long. $27^{\circ} 40'$; and, lastly, at Lat. $21^{\circ} 12'$, Long. $28^{\circ} 57'$. The last two localities were devoid of vegetation.

2. A Praying Mantis, species uncertain, collected in the middle of the desert. This specimen was, undoubtedly, adapted to its somewhat precarious life, for it was still alive after being a month in a box without food.

The remaining species were taken in the Oasis of Nukheila and consisted of:—

3. Two Sooliid wasps (*Dielis collaris* var. *eriphora*, Kl.). These were very active on the wing, persistently flying over the soil in search of their prey, which probably consists of larvæ of beetles.

4. One specimen of the moth (*Dioopeia pulchella*), which is a pest of Sann Hemp, but also includes many other host plants in its diet.

5. Eight specimens of mosquitoes obtained from the neighbourhood of the salt lake. These have been sent away for determination.

6. Some larvæ (probably Dipterous) obtained from the salt lake. Also sent away for determination.

7. A cockroach found running over the sand. New to our collection.

8. A scorpion, new to the collection. This was from Burg el Tiyr.

In addition, a number of birds were observed, and dried skins of others which had succumbed in the desert were brought in for identification. (These were simply dried corpses, picked up and brought in tins. We had not apparatus for skinning or for the preservation of entomological specimens.—W. B. K. S.)

1. At Nukheila were observed :—

Ten Garganey Teal (*Anas querquedula*), seen on the lake.

White Wagtail. (*Motacilla alba*.)

White-headed Chat. (*Enanthe leucopygia*.)

A number of black crows.

A hawk, undetermined.

A heron (?), undetermined.

2. At Burg el Tiyr (Lat. 20° 56', Long. 27° 40'), so named owing to the many traces of bird life found there; the rock—the sole feature of the landscape in this desolate spot—being covered with accumulated droppings of birds. Here a live hawk (undetermined) was seen, and the following dried skins of birds collected :—

Abyssinian White-eye. (*Zosterops abyssinica*). (N.B.—As *Zosterops* is a sedentary bird, this identification is so unlikely that it seems almost impossible.)

European Golden Oriole. (*Oriolus galbulus*.)

Hoopoe. (*Upupa epops*.)

Chiffchaff. (*Philoscopus collybita*.)

Red-throated Pipit. (*Anthus cervinus*.)

A Martin; new to the collection.

Although no birds other than those mentioned above were met with between Nukheila and Selima, numerous traces of them were observed all along the route, giving evidence of their migration across this waterless and featureless desert.

NOTES. By D. NEWBOLD.

Since the above was written, I have seen Admiral Hubert Lynes, C.B., C.M.G., who has an extensive experience of ornithological research in the Western Sudan. On hearing about Burg el Tiyyur, he confirmed that the discovery of so many corpses on this rock proved the existence of a *regular* migration route across the desert.

The following quotations from his paper *On the Birds of North and Central Darfur* (Ibis, July, 1924—October, 1925) are of interest in this connection :—

1. "There must be some (migratory) passage through even the most featureless and unexpected parts of the desert, otherwise how could those tiny patches of rushes in isolated Meidob have possibly held the Bluethroat, Red-throated Pipit, and Sedge-Warbler? We know, too, from Buchanan's and Geyr's travels, that Asben and Hoggar are both visited by no small numbers of migrants. Hartert had similar experiences at Insaleh . . . and these are not the only records of migration through what look on the map to be the uttermost parts of the desert."

2. "I think it not at all unlikely that the North-North-west trending line, Darfur Divide Range—Ennedi—Borku—Tibesti, will prove to be a not inconsiderable migration highway, and the next one to westward of the Nile Valley."

(N.B.—Burg el Tiyyur lies about not quite half-way between these two routes and may be a feeder route branching off at the Egyptian oases.)

3. "One may safely draw the following conclusion . . . that the absence of drinking-water in deserts must never be assumed as *ipso facto* a bar to migration passage across them; this is quite independent of the way in which absence of surface water may effect environment and food-supply."

The fact is that although a migrant bird can apparently do a day's journey of, say, 400 miles (the maximum in the case of smaller migrants, *e.g.*, pipits, warblers, etc.) without drinking, yet he must eat at least once in the 24 hours. Burg el Tiyyur lies in the heart of a desert which has practically no animal or vegetable life whatever. Birds are, it is believed, rather attracted to natural features, *e.g.*, rivers, mountain ranges, in their migration. What is more natural than that, on crossing this featureless desert, they should alight on this conspicuous rock in search of food and be too weak, in many cases, to arise again?

There must be many such bird-cemeteries in the North African deserts.

Hanns Vischer (*Across the Sahara*, 1910, pp. 238 and 262) noted migrant quails at Budduma, ducks flopping exhausted into pools at Bilma, and picked up "many beautifully preserved bodies of small birds about the road, probably passing across the desert in their annual migration."

Rohlfs, in 1879, noted migrant swallows in Buseima, Kufra, and Mrs. Forbes was told by the Kufra people that many migrants appeared there in March. In his 1874 expedition from Dakhla to Siwa, Rohlfs found a dead goose already mummified (*Drei Monate*, etc., p. 159) which had obviously flown from the West or South-west.

Schweinfurth reports a story of a Darfur caravan which got lost in 1872 and struck an oasis $1\frac{1}{2}$ days West of Beris with a pool full of wild geese.

Comyn (1906) found many dead migrants West of Selima, and noted birds coming into the Oasis from the West.

Harding King (1909-12) found the main bearing of the migration stream coming into Dakhla Oasis to be 217° from Müt (*see* Appendix IX).

Hassanein (1923) found fresh sleeping camps of birds about 60 miles South-South-east of Kufra and two hawks. The latter were probably sedentary and preying on the migrants, as at Burg el Tiyr.

APPENDIX VII.

Archæology.

By D. Newbold.

Archæological remains were discovered at the following sites:—

CAMP 13. EL JIHAF. East of Jebel Tageru. 16.II.27.—A white piece of sandstone, with four narrow grooves for rubbing and polishing tools or arrow-shafts. Found lying on desert.

CAMP 17. WADI HAWA. 18.II.27.—On the north bank of the wadi lie the ancient sites of dwelling-places, which I discovered in 1923, and described in *Sudan Notes and Records*, Vol. VII., No. 1, pp. 61 and 62. Here we picked up some pottery, including one small perfect bowl, and a number of the axeheads of green stone figured in the same article. There were also many bones and teeth of animals, and pestles and broken grindstones.

The axeheads are the most interesting relics. They are unlike any others that I have seen or heard of, except (a) a neolithic implement found in Huntingdonshire, now in the British Museum; and (b) two implements from America, in the Fitch Room of the Norwich Museum, both with very definite grooves for hafting or gripping.

They are not of glauconite, as I conjectured in my previous article, but have been identified by Mr. Grabham as being some of porphyryite, some micro-diorite, and some possibly dolerite. (See Appendix IV.) These are all igneous rocks, and it is rather a mystery whence the material was derived in this enormous area of Nubian sandstone. Judging by later finds, they were probably brought from the North.

The pottery is probably Meroitic, and the axeheads presumably belong to the same period, but may be earlier. They are of a type hitherto unknown in the Sudan (v. Crowfoot, Gordon Memorial College Annual Report for 1923, p. 29), and in default of further evidence can only be classed as "Libyan." As they were all surface finds, like most desert implements, dating by stratification is impossible. There was no patination. The biggest weighed 2½ lbs. All had grooves for hafting or gripping, except one triangular specimen with smooth sides, very like an implement found by Mr. Van der Byl in 1923 when hunting addax in the Wadi Hawa further to the South-west.

CAMP 19. WARA EL GILUD (Ridge of Zolat el Hammad). 19.II.27.—Here we visited the large group of rock pictures which I discovered in 1923 (see Plates V. and VI, *Sudan Notes and Records*, *op. cit.*), and I made copies of some which I had missed before, while Shaw photographed the best groups. The drawings, which are incised on sandstone rocks on the sides of a small hill, show tailed and phallic men, horsemen with plumes, elephants, ostriches, oryx, many cattle, and some very lifelike representations of hunting dogs.

No camels appear, which means that the pictures are at least 2,000 years old.

CAMP 27. NUKHEILA LAKE. 28.II.27.—On the flat top and sides of a small conspicuous weathered rock of white sandstone, near the lake, are some markings, which are unlike the "Libyan" petroglyphs described above and below. They are probably tribal markings or camel brands such as are scratched in profusion on and around the old Christian

convent at Selima. Some of them also have parallels among those found by Mr. Harding King on the road between Kharga and Dakhla, and figured in his "Mysteries of the Libyan Desert" (Appendix III).

CAMP 30. Lat. $19^{\circ} 20' 15''$, Long. $26^{\circ} 24' 13''$. 3.12.27.—Ten and a quarter miles North-North-east of Nukheila Lake is a small conical hill about 120 feet high, composed of weathered sandstone, standing among a group of similar hills, in the tiny depression in which Camp 30 lay. Pictures were found engraved on the lee (South-west) side of this hill, showing men, cattle, giraffes and other indeterminate animals. They included one interesting drawing of a giraffe with a curiously curved neck and horns curving the wrong way. It looked a later work, and had had four lines cut across the neck as though to show it was a mistake. Perhaps it was the work of an imitator. The conventional figures of men are paralleled by those I found at Um Tasawir in Jebel Tageru in 1923. (*Sudan Notes and Records*, *loc. cit.*). The giraffes and cattle are of the same school as Um Tasawir and Wara el Gilud.

CAMP 31. TAMAR EL GUSAR. 4 and 5.12.27.—(a) A small group of about ten drawings incised on some rocks on the West face of bluff, $1\frac{1}{2}$ miles South of Camp 31, overlooking the valley of Wadi Hussein. They were mainly of cattle, some picked out like a chessboard in squares. The rock here was much weathered, and some pictures had been almost eroded away.

(b) A bigger and very interesting group of pictures incised on rocks and sides of three sandstone hills, which lie in a prominent group about $1\frac{1}{2}$ miles North-North-east of Camp 31. Some are cut in positions which are now inaccessible owing to falls of rock from wind erosion. The majority are on a hill, which we named Sphinx Hill, especially a row of coloured pictures on the South-east side, on a concave surface about 35 feet up, and visible from the foot of the hill. They show a procession of cattle, coloured red, apparently from rubbing with friable red sandstone, and not from painting.

The other animals shown are giraffes, two of which are noteworthy for the faithful reproduction of the protuberant chest, addax, oryx, and other antelopes (?) There was a group of three pictures cut much more recently, as they showed fresh white weathering, probably by Guraan raiders on a visit, showing a sheep and an addax. The drawing was inferior to the older pictures.

CAMP 32. WADI EL ANAG. Long. $19^{\circ} 15'$, Lat. $26^{\circ} 30'$.—A prehistoric site was found here by Shaw, obviously the same sort of site as that at the Wadi Hawa. There were the usual grindstones, pestles, broken pottery, ostrich egg-shells, a sandstone arrow-polisher, and another of the green axeheads. On a hill above the site were two crude rock pictures of the type described above. It was because of this site that we named the water-bearing depression Wadi el Anag, "Anag" being the term used by the Arabs of the Northern Sudan to describe the non-Semitic aborigines.

Four miles North of this site we found a large number of pestles on the North side of the floor of Wadi Hussein.

The whole of this area was probably either permanently inhabited or a regular halting-place in ancient times. The discovery of the rock pictures gives us a useful link between the groups discovered by Hassanein Bey in 1923 at Owenat (see "The Lost Oases," pp. 203-205 and photograph), by Col. Tilho at the Oasis of Yarda in Borku during the war (see "Geographical Journal," August, 1920, p. 33, with photograph), and by myself at Golaat el Wish, Abu Sofian, Um Tasawir, Wara el Gilud, in 1923, and Nukheila now. The pictures at Yarda and Golaat el Wish and Abu Sofian contain camels and are, therefore, later than the more northern ones, which do not.

The older pictures almost certainly mark a migration route of Libyans, the "Tamahu" of the Egyptian monuments, from Tripoli and the North-west, via Kufra and Owenat, to Nukheila and Bir Natrun and thence to Kordofan and Darfur (v. *Sudan Notes and Records*, loc. cit., especially page 82, for development of this theory).

CAMP 33. Long. $26^{\circ} 35'$, Lat. $19^{\circ} 27'$. 7.12.27.—A mile South of this camp at a point some 35 miles North-North-east of Nukheila Lake on the open desert, we found another stone axehead half-buried in the sand. It was the best specimen of all, with a perfect rounded edge. It weighs $2\frac{1}{2}$ lbs.

CAMP 42. BURG EL TIYUR. 12.12.27.—At this remote spot, Long. $27^{\circ} 40'$, Lat. $20^{\circ} 56'$, in the heart of waterless and featureless desert, 150 miles from Nukheila and 130 from Selima, we found a solitary rock picture of an ox picked out in dots on the hard sandstone wall of Burg el Tiyur. The figure is obviously of the same school as those of Owenat

and Nukheila, but what the artist was doing there is a mystery. A pestle and ostrich shells were picked up near the rock. One can only surmise that there was an ancient route from Terfawi to Nukheila. Jennings Bramley mentions it as still known to the Arabs, but it is 350 miles without water, a desperate undertaking without water, even with camels, but seemingly impossible in the pre-camel era.

CAMP 50, NEAR JEBEL SELIMA ATSHAN. 16.12.27.—About four miles West of Jebel Selima Atshan I found another stone pestle. Comyn (1908) noted the discovery of a grindstone 40 miles West of Selima.

CAMP 51. SELIMA OASIS. 18.12.27.—The early Christian convent here has been described by Messrs. Currie (1901) and Leach (1925). It lies on the crest of a knoll. It is a stone building with the remains of seven rooms and a porch still visible. Five rooms are in a fair state of preservation: four are narrow cells about nine feet long by four feet broad. All are now roofless, and were probably roofed with palm logs from the oasis below. The stones with which the convent is built are not dressed or coursed, but roughly cemented with mortar of stone debris. The stone is local.

Many of the stone blocks and of the rocks composing the knoll are inscribed with writing or engraved with various designs. The writing is difficult to date, as many Arabs and others have scrawled names and "Allah" on the building and elsewhere, and visitors from Halfa, native and European, likewise. There are, however, three undoubted Cufic inscriptions, and a number of designs, some possibly cabalistic and some tribal marks or camel brands, which must be of considerable age, to judge from the weathering. It is impossible to disentangle them and date them all, but it is obvious that there has been continuous engraving and scrawling on the stones from at least the early Middle Ages until to-day. Some seem to have affinities with the Tifinagh writing of the Tuareg, others look like conventional figures of men, while some resemble well-known camel brands, which have been in use for centuries, notably the *Rigl el Ghorab*, or *Crow's Foot*, which is used by the Fezara section of the Nuba inhabitants of Jebel Haraza, Northern Kordofan, and the Tunjur of Darfur and Wadai, and the *Orfella* of Tripoli. In fact, several of the marks can be paralleled among those found scratched on rocks by the Beechey brothers in Tripoli over a century ago.

The finds of rock pictures and implements must be considered in conjunction with discoveries further to the North, viz. :—

- (a) Rohlfs' Expedition of 1874. Rohlfs' companion (Zittel) picked up some flint-flakes, "like stone knives found at Helouan." The site was near "Allemkuis," between Dakhla and Regenfeld.
- (b) Hassanein Bey and Mrs. Forbes, 1921. Ancient sites at Hatiyet el Etheila, between Kufra and Mehemsa, where the Arabs had also found grindstones.
- (c) Hassanein Bey, 1923. Rock pictures at Owenat, mentioned above.
- (d) Prince Kemal el Din and Dr. Ball, 1925. Flint and quartzite implements were found at various points between Terfawi and Owenat on the open desert; at the North-east corner of Erdi at Lat. $19^{\circ} 34'$, Long. $23^{\circ} 38'$, grindstones, pottery, ostrich egg-shells and arrow-heads; and a grindstone about 50 miles West of Nukheila.

In his paper on "Problems of the Libyan Desert" (G.J., September, 1927, page 220), Dr. Ball writes :—

"I have been much struck by the wide distribution of stone implements in the desert. I have found them, for instance, not only in Siwa Oasis and near the wells of Abu Mungar and Sheb, but also on the plateau between Baharia and Farafra, on the open desert between Terfawi and Owenat, and to the South-west of Owenat near the Anglo-French boundary.

"This wide range of occurrence, coupled with the finds of Schweinfurth and others on the plateaux nearer the Nile, inclines me to think that there is scarcely any part of the Libyan Desert in which stone implements might not be found by an expedition which would make the collection and study of them one of its main objects. The likeliest places in which to search (besides the neighbourhood of old wells and springs) would appear to be the shores of the various lakes and around the feet of hills affording shelter from sun and wind; for it is in such localities that I have usually come across implements and pottery. Grinding-stones, often with a sort of stone rolling-pin, unpolished celts, knives, and arrow-heads are the principal form of implements I have met with. Many of the grinding-stones must have been carried for a considerable distance, for they are made out of rocks which do not naturally occur in the localities in which they are found."

Until the implements collected from various parts of the Libyan Desert have been compared by experts with each other and with other primitive stone implements from the Nile Valley and North Africa, and,

similarly, until the rock pictures have been closely examined alongside the reproductions of rock pictures of the Sahara, Tibesti, etc., it would be premature to attempt to draw any detailed conclusions about the wielders of the axeheads or the artists of the pictures. It is, however, clear from the other evidence which we possess, viz.: oral tradition, the classical and Arabian geographers, the archæology of N. Kordofan and N. Darfur, which border the Libyan Desert to the South, that these remains mark, as has been mentioned above, a long-drawn-out migration or infiltration of Libyan peoples from the Mediterranean littoral and its hinterland across the desert to better watered and grassed regions of the Sudan. From the Egyptian monuments we know that this process was going on in the third millenium before Christ. It probably ranged from about B.C. 2500 to A.D. 500.

But whether the implements and rock pictures are contemporaneous with each other; whether any community actually settled at Nukheila or Bir Natrun or Tageru for any period of years, which of the various tribes of "Tamahu" were represented in this southward movement; which of Ptolemy's Libyan tribe-names and place-names are to be sited in these oases; whether there were more sources of water supply or whether, as some writers allege on rather scanty evidence, the climate of these deserts was much wetter in early historic times—all these questions must await solution until more exploration has taken place and excavation of selected sites has been undertaken. Even so, a number of these problems must always remain unsolved.

APPENDIX VIII.

Supplies, Equipment, Water, etc., for Men and Camels.

By W. B. K. Shaw and D. Newbold.

The following odd notes are included in the hope that they may be of use to any traveller making a journey under similar conditions. Infallibility is not claimed; they are simply the result of experience gained in this and other desert journeys in the Sudan.

A. CAMELS' WATER, FOOD, ETC.

1. WATERING.—Camels must have abstained a number of days to drink well. *Howwashing* can be done same day, but is better on

following day. When very heavily watered, camels are liable to damage themselves if started off immediately under big loads, and it may be worth waiting another day to let "their stomachs settle." Our camels did two waterless stretches of 240 miles and 275 miles without real distress. (N.B.—A bucketful of water will often enable an exhausted camel to stagger into camp and recover there.)

2. FOOD.—Ours had grazing only to Nukheila. We carried intact to there 2,100 lbs. grain (*dukhn*) for 39 camels for the Nukheila-Selima stretch. On this stretch camels were grain-fed on nine nights. Average 6 lbs. per camel per night. Baggage camels given more than riding camels. Camels that are not accustomed to grain feeding are hand-fed till they learn. They should be fed off sacks, else there is waste, and grain gets mixed with sand. A very little grazing was found on first four days; after that, none till arrival at Selima on night of tenth day. No bulk fodder, e.g., *libn* (chaff), dried *bersim* (clover hay), was taken owing to difficulty of carriage. Tree grazing is generally better than grass grazing, especially *seyal* and *tundub*.

3. MARCHING.—The Arab method of marching is long *shidds*, either all night or all day, according to temperature, grazing *en route* on what grass there is, with only momentary halts to allow camels to stale or loads to be adjusted. This was apparently the method adopted by Hassanein Bey in 1923 between Kufra and Erdi.

The European traveller's method is usually a 12 to 20 mile *shidd* in the morning, a mid-day halt, and an 8 to 15 mile *shidd* in the afternoon and evening. This is less of a strain for personnel, but involves loading and unloading twice a day. This is deprecated by Mr. Francis Rodd, who gives a very just summary of the points of camel marching in Chapter VI of his book on the Tuareg of Air, "The People of the Veil." While agreeing with the greater part of his conclusions, we think that no great harm is done by having a mid-day halt and double loading, provided the halt is for at least two or three hours.

With the caravan walking loose, *i.e.*, camels untied and unled, and grazing as they go, and marching six hours in the morning, three to four in the afternoon or evening, nearly 30 miles can be covered without any of the "pressing" which is so bad for camels. The Arabs get a sleep at mid-day, and Europeans get two regular meals, "breakfast-lunch" at 10 a.m. and dinner at 7-8 p.m. It is worth putting camels with

longest paces at head of caravan. Rigidity is to be avoided; Arabs should be allowed to go their own way as much as possible, provided the requisite distance is covered. Give them plenty of ropes and nets and let them arrange the loads themselves. Arab *howaias* (baggage saddles) with grass *bidds* (stuffing) are best, as they can be repaired *en route*, and can also be adjusted for galls much more easily than, *e.g.*, army *howaias*. We only had two camels galled out of 39 after 900 miles.

In very cold weather, such as we encountered, too early a start should not be made, as camels may founder from cold. Otherwise, of course, marching should be done in cool of early morning and evening.

Bad stony going is, after heat, the worst enemy. It slows down the caravan and tires camels enormously, even if it doesn't lame them. We carried one or two pairs of leather boots for footsore camels, but did not have occasion to use them. Arabs usually cut a piece of leather and sew it into the foot over the sore place, or work it into a punctured sole.

Loads depend on local custom and type of camel. Some of our camels carried 480 lbs. for 600 miles. Average load was probably 350 lbs., but they lessened, of course, as water and grain were consumed.

Milch camels are spoken of by travellers as useful for their milk, but presumably a she-camel wants grazing to produce milk, and in any case the idea is impracticable for a large caravan. Thirst was the least of our problems, and we have no experience of this practice, which appears to have acquired an exaggerated value in writers on desert travel.

Guides, escort, etc., should carry their own water-skins, so as not to overburden baggage camels; but if any trotting work, *e.g.*, scouting, fuel collection, is to be done, they must leave the skins with the *hamla*.

4. ENDURANCE.—How far can a camel caravan go without water? Ours did 275 miles, from Tamar el Gusar to Selima, ten days' hard marching, having done another waterless stretch of 240 miles, nine days' march, a fortnight previously. It is certain that our caravan would have done 300 miles (11 days) without loss of any camels, though very probably with a few stragglers and some shifting of loads.

With continued grain feeding they might have done 12 days, 325 miles, but only after the abandoning of, say, one-third of them on the way. This abandoning would be chiefly due to lack of bulk food, *i.e.*, grazing. With moderate grass grazing, the whole caravan, except

weaklings, could have reached 325 miles. An emergency party riding light on selected camels, eating 10 lbs. of grain per day, could probably have reached 350 miles, but we regard 325 miles as the absolute limit for any large part of the loaded caravan, always presupposing cold weather, *i.e.*, a maximum daily range of 50° to 80° Fahr. and fair going, *i.e.*, no long stretch either of soft sand or of sharp stones.

The following comparisons may be useful. They all refer to similar waterless journeys in the Libyan Desert with loaded baggage animals. Freak riding feats are excluded as being both irrelevant and valueless in this connection.

(a) *Rohlf's, Zittel and Jordan. Dakhla to Siwa, via Regenfeld. January 16th—February 20th, 1874. 424 miles (683 km.).*

In 35 days, of which 21½ were marching days. Average rate of march was 2·4 miles per hour, and average hours marched 8·7 per day. There was no water on the route, but a providential downpour of rain (16mm.) at Regenfeld on February 2nd and 3rd enabled the party to fill their *fantasses* and turn North for the long trek over unknown desert to Siwa. The camels were apparently watered on January 26th at "Allemluis," between Dakhla and Regenfeld, and then again on February 12th, but incompletely, at "Sandheim," both times from *fantasses*. The empty *fantasses* were then dumped in the desert. This means that the camels went for 17 days without water, but in this period only covered about 170 miles. After the second watering they covered another 170 miles to Siwa, thus accomplishing 340 miles with a fair drink at midway. Apparently the camels did not drink at Regenfeld, but this is not clear from Rohlf's description in his "Drei Monate in der Libyschen Wüste." The party consisted of 10 men and 20 camels. Fifteen camels carried two *fantasses* each and one sack of camel-fodder and one sack of straw. The other five carried tent, provisions for 20 days, and baggage. The best marching camels were led in front, the rest followed tied together in a string. The three Germans mostly walked on foot.

On February 11th Acacia Seyal was found. The charcoal had run out and some crates and boxes had been set aside for fuel. On February 15th and 16th, there were a few plants, and on 17th and 18th the vegetation was richer, and jackals, jerboas and lizards encountered. On February

19th, the first *alim* was seen, and on February 20th the caravan entered Siwa Oasis with several days' provisions still in hand.

Altogether, in three months, Rohlfs covered 1,486 miles. His marching days were 68½, his average rate 2½ miles per hour, and hours 8·7 per day. He compares this with Cailliaud's Siwa-Baharia-Kharga-Dakhla journey, accomplished in 44 days at 10 hours a day and 2½ miles per hour, in 1819.

- (b) *Ahmed Bey Hassanein and Mrs. Forbes, Bir Zakar (Kufra) to Jaghbib Oasis, 346 miles (556 km.), January 29th—February 10th, 1921.*

The party consisted of five persons and nine camels. They marched 12 or 13 hours a day for 12 days, averaging 29 miles a day. The rate therefore works out at 2½ miles per hour. Four camels carried "immense loads" of date-fodder. Two camels carried provisions and baggage. The remaining three carried water, 12 girbas and three *fantasses*. The Arabs fed on flour, oil, tea and sugar. Hassanein and Mrs. Forbes carried "18 one-man ration tins, a dozen sardine tins," rice, coffee, tea and biscuits. Some fuel was carried, but patches of wood were found *en route*. There was good grazing on juicy herbs at Mehensa on the third day, and green grazing on 9th, 10th and 11th days. The temperature showed great diurnal variations, averaging 91° F. at noon, and falling at times to three or four degrees below freezing at night.

This was a remarkable journey. The 346 miles were covered without watering the camels between the terminal points, but the green grazing, which is nearly as good as water, at Mehensa and especially on the last three days, when the caravan was at the end of its tether, must have helped considerably.

- (c) *Ahmed Bey Hassanein, Jebel Owenat to Erdi Well, 267 miles (430 km.), May 6th—15th, 1923.*

Nine marching days, at an average of 12 marching hours per day (but actual marches varied from four to 14 hours) at a rate of 2½ miles per hour. The party apparently consisted of 20 men and 28 camels. The camels went for at least 10 days without water. The only grazing met with was patches of dried grass, in the latter half of the journey, and rich green vegetation 15 miles out of Erdi. Water was carried in 25 girbas (waterskins) and four 4-gallon *fantasses* and four 12-gallon

fantasses. The full supply was about 200 gallons. The chief provisions were dates and rice.

- (d) *Baggage camel convoy following Prince Kemal el Din's Citroen expedition from Terfawi to Jebel Owenat, January, 1925.*

The distance was 276½ miles (445 km.). There was no water between these points. I have no particulars of this journey, but there can be little or no grazing. No European accompanied the camels.

(e) Hassanein Bey tells of Arab caravans going direct from Dakhla to Owenat, a waterless journey of at least 350 miles.

Captain A. S. Leese, on pages 87 and 88 of his recent book on "The One-Humped Camel" (1927), records some instances of camels' endurance: "In Tietkin's journey in Australia in 1891-2, his camels marched 537 miles in 34 days without a drink; a few survived. Possibly good grazing and dew may have assisted the animals on this record-breaking journey.

"Some of Giles' camels in Australia survived eight days at 28 miles per diem in April without water; others went 17 days at 23 miles per diem with only one drink on the road."

B. MEN'S FOOD, WATER, ETC.

1. FOOD FOR EUROPEANS.—The following list is made up from items taken by us, and has been amended in quantity here and there in the light of our experience.

Correct list of supplies for two persons for 60 days :—

- 50 lbs. army biscuits
- 10 tins bully beef, 12-oz. tins (this assumes finding a good deal of game)
- 15 Chedlet cheese (6-portion boxes)
- 9 tins Quaker Oats, 24-oz. tins
- 8 tinned fruit
- 6 tins "Ideal" milk (6-oz. tins)
- 8 tins bacon
- 8 tins sausages
- 12 tins cocoa (½-lb. tins)
- 10 tins A. & N. C.S.L. limejuice crystals

6 tins baking powder ($\frac{1}{4}$ -lb. tins)
 12 packets candles (6 per packet)
 5 tins tea (16-oz. tins)
 15 lbs. Fowler's treacle
 20 tins solid Bovril (6 tablets per tin)
 10 tins vegetables
 3 bottles Horlick's malted milk
 6 tins dripping (2-lb. tins)
 6 lbs. jam
 10 tins dried milk
 2 tins salt
 3 small tins mustard
 150 lbs. flour (this fed two servants also)
 6 bottles Worcester sauce
 12 lbs. beans
 10 lbs. onions
 6 lbs. lentils
 15 lbs. rice
 10 lbs. dried fruit, especially figs
 500 saccharine tablets
 1 bottle curry powder
 1 tin pepper
 6 tins sardines
 20 lbs. dried dates

NOTES.—The treacle was for eating with Quaker Oats. The biscuits are invaluable for eating on march and when bread-making is impossible. The tinned fruit and tinned bacon and sausages may be classed as luxuries; a few luxuries have a good psychological effect on days when there is a crisis. The dried milk is optional. It, at any rate, gives tea the customary colour. Tinned milk, once opened, is a nuisance to carry.

The important items are porridge, dates, biscuits, rice, figs, tea. If necessity decrees, all the rest *could* be omitted. The above items presuppose:—

- (a) cold weather, which means hunger;
- (b) two square meals a day, and a pocketful of biscuits and dates for the march.

Good food means good digestion, and good digestion means optimism. Bad food means bad temper and pessimism.

2. FOOD FOR NATIVES.—Flour, onions and *semn* (clarified butter) for servants and police. The Arabs ate mainly grain cooked as such and drank coffee and tea. Gifts of these latter are always welcome and minimise "grousing." A few cups of tea at the end of a hard day make a new man of an Arab. Dates were not available, but would have been useful. The two guides from Dongola brought some.

3. WATER FOR EUROPEANS AND NATIVES.—For the 30 men of the party on our longest waterless stretch, 275 miles, we carried:—

26 *fantasses* at 10 gallons each... .. 260 gallons.

About 30 Arabs' waterskins, estimated

total 130 ..

390 ..

We had estimated an allowance of one gallon per man per day, and had brought a good margin. This was, in fact, about what we consumed, for on the morning of 16.12.27, the day of arrival in Selima, we had 100 gallons in hand. The Arabs (23 in number) did not need water from the *fantasses* till seventh day after leaving Tamar el Qusar, when their waterskins gave out.

Had the weather been hot, 1½ gallons per man a day would probably have been necessary. In either case it is a fairly generous allowance.

4. FUEL is always a difficulty in deserts; between Bir Natrun and Nukheila and Selima there is no firewood at all. "Meta," compressed fuel, bought in England, melted in El Obeid before starting, and it is unlikely that a native cook could use it with success. The only plan is to carry as much as possible between oases. We were reduced to burning *sibias* (wooden tripods for hanging things on), rods of mosquito nets, and boxes.

C. MEDICAL.

We took a medicine chest measuring about 18 inches each way with following contents:—

Chlorodyne.

Emetine ampoules.

Epsom salts.

Potassium permanganate.	
Bismuth and soda	} All in tabloid form.
Quinine and rhubarb	
Dover's powder	
Aspirin	
Quinine	
Tincture of iodine.	
Castor oil.	
Liq. ammon. fortis (to revive a patient in case of shock).	
Cotton wool (compressed).	
Bandages and lint.	
Forceps.	
Lorder-Brunton pocket snake-bite outfit.	
Morphia and two hypodermic syringes.	
Toothache liniment.	

The Libyan Desert in winter must be one of the healthiest spots in the world. We had no occasion to open this box, except when Mattar (the guide) cut his foot on some object in Nukheila lake, and when another Arab made an incision in his ankle with a rusty razor-blade in order, he explained, to cure an old rupture!

We also took a Berkefeld filter, but it proved a white elephant. The flow was too slow and it got choked at every second pumpful and had to be dismantled and cleaned. The Arabs preferred to fill our canvas bath with the turbid well-water and then throw in pieces of tree bark, usually "mokheit," in order to clear it. This was not very successful, but at least has Mosaic authority, when we remember the sweetening of the waters of Marah in Exodus xv, 25.

D. GEAR AND EQUIPMENT TAKEN.

Tent, double-fly. A tent is a necessity for any scientific work or mapping, and almost essential at midday halts in shadeless desert.
 An "Abyssinian" folding wooden table.
 Large waterproof ground sheet.
 Two deck chairs and two folding camp chairs.
 Two camp beds and bedding carried in Wolseley valises. Four blankets each. Sleeping bags are best.

Canvas bath. This was also used to water camels from at a well.

"Shamadan" candlesticks and 100 candles.

Matches and a burning-glass.

Washing soap.

26 ten-gallon fantasses, 22 with wooden bungs and four with screw tops.

Latter are best. Several spare bungs for former were taken, as they often swell and jam and have to be drilled or burnt out. Two leather funnels for filling to avoid waste of valuable water and time. Solder and two soldering irons for mending leaky fantasses. Paste (not liquid), flux.

Spade and mattock.

Hammer.

Housewife. Packing needle and whipcord for mending tent, etc.

Two electric torches with spare batteries. Big Hellesen torch for camp work. Hand torch for theodolite and carrying on march (guiding-light over dunes, reading star chart, etc.).

Fifty yards of good rope, partly for loading, partly for well buckets and other purposes. Loading rope-nets for camels.

Two big "delus" (leather well buckets).

Steel measuring tape.

Three canvas water-bottles.

Little canvas bags, numbered serially, for geological and archaeological specimens.

Wire press for botanical specimens.

Two cameras and films for 90 exposures.

Two Mannlicher magazine rifles and 200 rounds.

Shot-gun and 50 cartridges.

Two pairs binoculars. Small telescope.

Notebooks, maps, pencils, squared paper, solid ink pellets, mathematical instruments, protractors.

Theodolite, aneroids, clinometer, compasses, watches, thermometers (*see* Appendices I and II).

CLOTHING.

Khaki shirts and shorts, stockings, socks, canvas leggings, grey flannel trousers, ankle boots and shoes (one pair each with crêpe rubber soles), slippers, double terais, helmets, sweaters, woollen scarves,

woollen Balaclava caps, handkerchiefs, Norfolk jackets, British warm, dark glasses, gloves, underwear.

N.B.—It will be seen that this is mainly a cold-weather outfit, but even so we were often, especially when on the march at 3 a.m. against a bitter headwind, none too warm. The gloves and woollen caps were a godsend.

It is a great relief after having walked, perhaps, 20 miles and ridden another 10 in a day, to get into flannel trousers and slippers in the evening. Crêpe-soled shoes are necessary when there is any rock-climbing to be done.

APPENDIX IX.

Zerzura Oasis. Does it exist?

By D. Newbold.

(NOTE.—A good deal of the information contained in this Appendix is identical with the evidence published by Dr. Ball in a series of articles in the *Geographical Journal*—July, August, September, 1927—but was actually compiled independently at different periods since 1922. I have, however, added some data from the Arabian geographers and other native sources. I am indebted to Dr. Ball for his theory of static water levels and one or two minor references to Zerzura, which I had not discovered, also to Mr. W. J. Harding King who furnished me with some data additional to that published in his "Mysteries of the Libyan Desert."

—D. N.)

There is a good deal of evidence, both direct and indirect, about the legendary oasis of Zerzura. The following is an attempt to summarise all that we know about it from written and oral sources. The evidence is largely hearsay, and so vague and disconnected that we are left in uncertainty, not only about the site of the oasis, but about its very existence.

SUMMARY OF EVIDENCE.

(a) THE NAME ZERZURA.—Zerzura is probably derived from "zarzur" (Ar. = starling or sparrow), and means "the place of small birds." Ball suggests a derivation from "zeer," i.e., that it may not be an oasis but an ancient water-dump of jars, like Pottery Hill in Lat. $24^{\circ} 26'$, Long. $27^{\circ} 39'$. (v. "Les Dépôts de Jarres du desert de Lybie," Prince

Kemal el Din Hussein, *Revue Scientifique*, No. 19, 1927). I think this is unlikely, both etymologically and evidentially. There is an Auasi Zerzour on the French maps of Tunisia, and various tribes called Awlad Zerazir in the Sudan. Another possible derivation is from "izerzer," which is, I believe, the Berber word for "gazelle."

(b) TRAVELLERS' REPORTS.—I. G. Wilkinson visited Egypt in 1818 and later years, and on p. 358 of his book "Thebes and Egypt" (London, 1835) writes:—

"About five or six days west of the road to Farafra (from Baharia) is another oasis called Wadee Zerzoura, about the size of the Oasis Parva, abounding in palms, with springs and some ruins of uncertain date. It was discovered about nine years ago by an Arab in search of a stray camel, and from the footsteps of men and sheep he there met with, they conclude it is inhabited. Gerbabo, another Wah, lies six days beyond this to the west and 12 days from Augila; and Tazerbo, which is still farther to the west, forms part of the same oasis: and they suppose that Wadee Zerzoura also communicates with it. The inhabitants are blacks . . . though the 'Vallies of the Blacks,' a series of similar oases, lie still farther to the west.

"It is supposed that the Blacks who invaded Farafra some years ago and kidnapped a great number of the inhabitants were from this oasis (*viz.*, Zerzura).

"By another account Zerzoura is only two or three days west from Dakhli, beyond which is another wadee; then a second abounding in cattle; then Gebabo and Tazerbo; and beyond these is Wadee Rebecana. Gebabo is inhabited by two tribes of Blacks, the Simertayn and Ergezayn."

This, the first reference by a European to Zerzura, shows not only that the tradition is over 100 years old, but that there were two Zerzuras, one in the North and the other in the Central or South Libyan Desert. The former site would be roughly Long. 26°, Lat. 26°, and the latter Long. 27° 30', Lat. 25° 30'. Incidentally this report is made more valuable by the surprisingly accurate knowledge of the different oases of the Kufra group, *viz.*, Kebabo, Taiserbo, and Ribiana, and even of the oases to the west of Kufra, presumably Wau el Kebir and Wau el Namus, still unexplored to-day.

(b) M. FRESNEL, a Frenchman who served on a mission in Tripoli in 1846, and later as Consul in Jeddah, accumulated a mass of data about routes in Wadai and the Libyan Desert, partly from Cyrenaican and Wadaian Arabs, and partly from Takarir pilgrims at Jeddah. He published his results in the *Bull. (?) de la Soc. de Geogr.* in 1849. He does not mention Zerzura, but describes an exploratory journey made

by a caravan of Sultan Mohd. Abd. el Karim, surnamed Sabun, of Wadai from Wara to Benghazi in 1809 or 1810, under the guidance of an Arab of Jalo called Shehaymah. The party marched to Dimi in Erdi, thence six days North-North-west to Jebel el Nari. There they suffered from thirst, and some rode East for three or four hours to an oasis where they found water. Jebel el Nari may be Owenat, but is probably more to the West. The oasis has not been identified. It apparently lay on an old route to Egypt. A previous expedition sent by the Sultan to get through from Wadai to Dakhla direct, perished in the deserts North of Darfur; but legends of this East to West route across the Libyan Deserts have persisted (*see* especially Paul Borchardt's "Die Groben Ost-West Karawanenstrassen durch die Libysche Wuste." *Petermann Geogr. Mitteil.* 1924, p. 219), and they all point to the existence of an oasis between the Kufra-Owenat line in the West and the Dakhla-Terfawi-Selima line in the East. M. Jomard, then President of the Société, wrote that there was certainty of a caravan route of 34 days' journey between Wara and Selima. There is no specific indication of Zerzura in the above, but the whole of M. Fresnel's paper, "Memoire sur le Waday," is worth reading in connection with the desert between Kufra and Wadai.

GERHARD ROHLFS, who went from Dakhla to Siwa by a route West of Farafra in 1874, heard about Zerzura in Dakhla (*see* p. 115 of his "Drei Monate in der Libyschen Wuste"), but no one could tell him exactly where it was. He apparently had little faith in it, as he gave the name "Sersura" to a spot in the open desert 120 kilom. West-South-west of Dakhla, where there were a few plants. Ascherson, Rohlf's botanist, was told in Dakhla that about 1770 there had been frequent raids on Dakhla from the South-west, and the Mameluke Government sent patrols out to destroy the wells seven or eight days out. The raids thereupon ceased. Ball suggests that these wells were perhaps water-depôts of jars like that found at Pottery Hill. Whether this be so or not, we have confirmation of this story in the MS. History of Siwa, a native fifteenth century document, which tells of Tibbu raids from Wadai (?) on to Siwa, which were stopped when a Siwan holy man, Sidi Suleiman, prayed for the road to be blotted out. It seems impossible for the blacks to have raided either Siwa or Dakhla from the South-west without some intermediate oasis as a stepping-stone.

"MURRAY'S GUIDE TO EGYPT," ninth edition, 1896, is quoted by Ball as recording four traditional sites for Zerzura:—

- (i) Some days South of Dakhla (Bir Terfawi [?]).
- (ii) Five days West of Farafra (*i.e.*, Long. 26°, Lat. 27°).
- (iii) Three days West of Dakhla (*i.e.*, = Wilkinson's No. 2).
- (iv) Two or three days West of Selima (*i.e.*, Lat. 21° 30', Long. 28°)

These reports, like Wilkinson's, obviously refer to at least two Zerzuras. No. (iv) would bring the oasis well within the borders of the Sudan. We passed within 30 miles of this site.

LIEUT. DAVID COMYN, Black Watch, made a journey in December, 1906, on behalf of the Sudan Government, to patrol and inspect the desert West of Halfa. He wrote a long official report, and a short note on his journey was also published in the "Geographical Journal" for April, 1908. After visiting Shebb and other wells North of Selima, he went 130 miles West-South-west from Selima, and, finding no water, turned South-east to Lagia, 100 miles further. The distances are his own, and probably exaggerated. He says (i): "There is not the slightest doubt to my mind that oases exist to the West, and not far from Terfawi. The whole lie of the land points to it. The Arab belief is that four days beyond exists a land overflowing with milk and honey." And (b): "A number of birds came from the West to Selima. Could this point to a lake of sorts to the West?" And (c)—at his furthest point: "We had to halt and return, though commonsense urged that one day more would bring us to a different country. It could not be all sand; it was already changing." And (d): "That at this point there was a heavy fall of dew, which convinced the Arabs with him that there was an open sheet of water to the West."

In fact, we passed West of Comyn's furthest point, and had with us Comyn's guide. His report is very interesting but rather vague; and, after seeing the country West of Selima which he describes, I have come to the conclusion that the account is not of great value. Dew occurs in the desert a long way from water. The birds might have come from Terfawi or Nukheila. The country, which was "changing," was just as barren beyond his limit as up to it. His journey however proves, if it needed any proof, that Zerzura does not lie between our route and the Arbain road.

H. E. HURST, in "A Journey in the Western Desert of Egypt" (*Cairo Scientific Journal*, November, 1910), writes :—

"One frequently came across people in Dakhla who had heard rumours of an unknown oasis called Zerzura somewhere to the South-west, but no one seemed to possess any definite information. It was said that about 70 years ago (*i.e.*, about 1840) a man and a woman driving a cow came into Dakhla from Zerzura."

W. J. HARDING KING made a number of journeys in 1909-1913 in the desert South and South-west of Dakhla, and accumulated a certain amount of information about Zerzura, mostly rather vague and disconnected, but certainly more detailed than anything reported previously. It appears in his "Mysteries of the Libyan Desert," and can be summarised as follows :—

(a) Many people in Dakhla had heard about Zerzura, and King's informants included the Omda of Rashida village and a number of natives of Gedida and Qasr Dakhil. Among the traditions of it was one that wild cows had come in from it and crows and palm doves. The last cows had come in about 1895. Another report said that a woman and boy had come in from the South, and another that years ago some very tall black men with long hair and nails came out of the South-western desert and stole bread from the people of Dakhla. They were pursued, and their tracks followed to a well which the pursuers salted to prevent its further use. All the reports agreed that Zerzura lay to the South-west.

(b) KING refers in his book to certain Arabic MS. "Treasure Books," which describe, partly in cabalistic form, buried cities in the desert. One of these books, ascribed to the fifteenth century, refers to "the City of Zerzura," with "palms, vines and flowing wells." It lies "East of the Kalaa el Souri," after a wadi opening to the West. It has a king and queen sleeping enchanted in the palace! Other passages in this book refer to King Cambyse's Mines. It is probable that some accurate knowledge of definite lost sites underlies the rambling stories of treasure and magic castles contained therein.¹

¹ Since I wrote the above, two short papers on Zerzura have appeared in the September, 1928, issue of the "Geographical Journal." The first is by Mr. Harding King and the second by Dr. Ball. In his paper Dr. Ball records his discovery that "Zerzura" is mentioned in another and earlier Arabic MS., dated A.D. 1246, by a Syrian Emir of the Fayum, in the Ayyubide dynasty. He sited it as an abandoned village north of the Wadi Rayan. Dr. Ball also notes that Mr. Harding King's "Treasure Book" is an anonymous work entitled "The Book of Hidden Pearls," which was translated into French and published in Cairo in 1907.

(c) Two Arabs reported to Harding King that they had actually seen Zerzura. One, of the Bedayat tribe, was riding five days North of Nukheila along a dune belt, and climbed a high black hill among the dunes, from the top of which a large oasis was visible under a cliff with olive trees and tamarisks. Another Arab, riding eight days South of Dakhla, saw a large oasis under a scarp, with olive trees, palms and wells, one big ruined town, and several hamlets with a few people. This Arab was afraid to approach it, so we are left with this tantalising report.

(d) KING judges from bird-migrants, coming from the South-west into Dakhla with olives and grass seeds in their crops when shot, that an oasis must lie about 225 miles (*i.e.*, nine hours at 25 miles per hour) to the South-west of Mut village, in the direction of the migrant stream, a bearing of 217° from Mut. It must, however, be remembered that Terfawi wells lie some 40 miles to the West of where they were then sited on the maps, and the birds may have come from there.

(e) King was told that there was high ground North of Zerzura, and deduces therefrom that there may be a prolonged hill-feature of which Owenat, 130 miles to the West, is the Western limit.

In correspondence, Harding King has informed me that the informant who told him Zerzura was five days North of Nukheila was very reliable. The man who went from Dakhla was less reliable, and may have been referring to Terfawi.

If we take a day's journey as 30 miles, the former estimate would put Zerzura about Long. $26^{\circ} 15'$, Lat. $21^{\circ} 15'$. In the map accompanying King's original articles in the "Geographical Journal," September, 1913, he sites Zerzura with a query about Long. $27^{\circ} 20'$, Lat. $21^{\circ} 30'$. It should be noted that of the unknown water-sources reported by Harding King in his paper, Owenat was found 10 years later almost exactly where he sited it, and Merga (Nukheila) 12 years later correct in latitude, and only 30-35 miles wrong in longitude. Consequently, unless his informant was either deliberately lying or unwittingly repeating a legend, there seems every reason to suspect that this siting of Zerzura about halfway between Selima and Owenat, between Lat. 21° and 22° , is at present the most reasonable conjecture of its position that those who believe in the existence of Zerzura can make.

INFORMATION GAINED FROM HOWAWIR ARAB
POST IN 1916.

An armed party of Howawir Arabs from Northern Kordofan was stationed at Bir Natrun in 1916 for purposes of defence and reconnaissance against enemy movements in the Western Desert. Patrols were detached from time to time from the main party and explored the deserts surrounding Bir Natrun and Nukheila. The patrol reports sent in to the Sudan Government Intelligence Department in 1916 include two interesting statements. The first is that a party of 42 men under Hussein Mattar, after two-and-a-half days' march to the North, found a *meshra* (watering place), with palms and ruins of old dwellings; and the second states that a well was found one-and-a-half or two days North-west of Nukheila, which was chiefly remarkable for a conical hill of pure salt. A well-marked track proceeded from there to the North-west. Some of the party followed this track for another day, and next morning saw a large hill standing out in the distance. The track still going North-west led to this hill. They then turned back.

The first report had excited our interest, and we especially secured the services of Hussein Mattar for our journey, in order to discover this unknown *meshra*, which we hoped to find at least 50 and possibly 70 miles North of Nukheila. Unfortunately, as related in the narrative, it turned out to be not the missing Zerzura but the water-bearing valley, which we called Wadi Hussein, only 17 miles from the lake. Apparently the 1916 patrol had taken a large detour from the lake before they arrived at it, which accounts for the two-and-a-half days.

The second report, however, almost certainly refers to an oasis outside the Nukheila depression. The well-marked track must be a road from Nukheila to Owenat, and the "large hill," J. Kissu, which is over 5,000 feet above sea-level, about 25-30 miles South-east of J. Owenat. Now J. Kissu was first visible to Ball on his Nukheila-Owenat journey at his Camp 29, Long. $25^{\circ} 51'$, Lat. $20^{\circ} 45'$. We can therefore assume that the Howawir reached this point or its neighbourhood, but an objection is that it is 120 miles from Nukheila, and the report states that they saw the hill at latest on the fourth morning. This is just possible; alternatively, they may have seen it nearer Nukheila by mounting a ridge. In any case, we may place an oasis, not yet known to a European, from 35-60 miles North-west of Nukheila, which *may* be the missing Zerzura.

On the other hand, we have other reports of another "lost oasis," called Ain Kiyeh, somewhere in this area. It figures on various nineteenth century maps, and apparently retains the name of the Kiyeh or Kai-Buala tribe of Wadai. It has often been confused with Nukheila, *e.g.*, by Charles Neufeld (*see* Chapter I of his "A Prisoner of the Khalifa" and the accompanying map) and on the French 1/2M. Map of Africa, feuille 21, 1896, which followed the earlier map by Miani of the Nile Basin. But other maps, *e.g.*, the 1/2M. Map of Sudan and Wadai (Survey Dept., Egypt, 1913) and the official 1/3M. of the Sudan (War Office, 1921), both show it as lying some 52 miles North-west of Tura el Bedai (Nukheila). Even if the name Kiyeh properly belonged formerly to Nukheila, of which there is little evidence beyond Neufeld, there seems no doubt that there is an oasis about 50 miles North-west of Nukheila from other reports. I was myself told, in 1922, by some Howawir that they had heard of its existence from a captured Guraani, who had given them its Tibbu name, which they had forgotten. It was said to have date-palms and a surface spring of water.

Now, in the winter of 1915, a caravan was sent by Sultan Ali Dinar, of Darfur, from Fasher to Kufra, via Nukheila and "Anuar" (Owenat). The guide was a Bedai called Bidi Audi, and his narration of the journey was published by Mr. A. J. Arkell in *S. N. & R.* ("The Southern Road to Kufra," December, 1922). Two days North-west of Nukheila the caravan watered at a well which the guide had discovered on a previous raid. ¹This water-source, called after him Bir Bidi, may well be Ain Kiyeh. Whether it is also Zorzura is another matter. I very much doubt it.

Mention should also be made here of the legendary Kabila, of the Kiyeh Tribe, an inhabited well on the Abeshr-Dongola road, reported to Mr. H. R. Palmer, Lt.-Governor of Northern Nigeria, by a Wadaian as lying East of Ennedi and five days North of Mazrub. This may be Teigo well or Um Hagar well, both alleged to lie South-west of Bir Natrun, but may equally be Ain Kiyeh. It is true that Dr. Ball and Prince Kemal

¹ Since writing the above I have received an amplified account by Bidi Audi of this well, through the kindness of Mr. D. C. Cumming, District Commissioner, Northern Darfur. Bidi states that this well was found by him in 1904 on a raiding expedition to Owenat. It lies 30 to 40 miles North of Nukheila, in a depression or crater 100 feet deep and half a mile in diameter. In 1915 he found it again without difficulty. He also reports a well called Bir Hamra, 30 miles South of Owenat, in cotton soil (?), with water at 2 feet. This latter well may be a myth, but Bir Bidi seems authenticated. It may be a North-westerly extension of Wadi Hussein. The 1915 caravan watered 168 camels at it.

el Din saw nothing of any well or oasis between Nukheila and Owenat, but it might easily be invisible in a small depression only 10 miles off their route.

SHEIKH FADL EL MULA WAD RAKHA, late Omda of the Dongola Kababish, who had an extensive knowledge of the Western Desert, told the Senior Inspector of Dongola, in 1916, that one of the Ashraf told his father of a place called Um Larzar (I imagine this is a misprint in the Intelligence Report for Um Zarzar), which he had heard lay North of Lagia (*i.e.*, on the 28th meridian) but the description so tallied with what he found at Nukheila that he thought they might be the same place. This is unlikely, as Nukheila is West-South-west from Lagia. It seems that this is a genuine reminiscence of Zerzura, and, if so, the only one from the Sudan. If it exists West of Selima, the Dongola Arabs are the most likely to have heard of it. I questioned Sheikh Fadl el Mula further in 1924, but he is an old man and his memory was failing. He promised to make further enquiries, but nothing resulted.

AHMED MOHD. BEY HASSANEIN, during a conversation with me in September, 1926, said that he believed in the existence of Zerzura, but had met no Arab who had been there. He conjectured that there was a line of wells or *gellis* running East from Owenat, and reminded me of the old route leading from Egypt to Owenat.

THE ARABIAN GEOGRAPHERS.

(c) EL BEKRI, writing about A.D. 1068, tells of a lost oasis called Sobrou, apparently West or South of Dakhla. No one has been able to penetrate to it, except certain travellers lost in the desert. An Arab called Rejma ibn Kaid, of the Cyrenaican tribe of "Corra," chanced upon it but could not later return to it. About A.D. 1029, the Emir of the Beni Corra, Moghreb ibn Madi, tried to reach it with an expedition, but his provisions ran out. On the way an ancient building and a brick wall surrounding a hill was found.

El Bekri also relates the story of a black giantess, who apparently came from this oasis and was captured stealing dates from Dakhla. She spoke no known language, and was released so that her captors could track her to her home, but she outran them and they failed. He further records the existence in this part of the desert of "El Jezair," the Islands,

patches of sand bearing dates and water, but showing no sign of man and echoing with the whistling of the Jinn.

These reports sound like fairy tales, but follow certain well-known conventions. The black giantess recalls Harding King's "tall black men," who also stole from Dakhla, and the Islands have a parallel in Philby's story of the glades of "El Khiran" reported from the unexplored empty quarter of Arabia.

EL IDRISI, who wrote in the first half of the twelfth century, states that there are many deserted oases across the whole breadth of the Libyan Desert, from Assuan to Kavar and Kuku. He quotes Ibn Haukal about goat and sheep which have gone wild and were hunted in this area. He also describes the Southern Oasis Country, inhabited by the Taguitae or Tadjerin, a brave pagan race; Tajua was their capital and may be Bir Natrun. It is so marked on old maps. He also mentions Mount Ghalsani, South of Dakhla, with a mine of lapis-lazuli, and two ruined cities called "Merenda" and "Showar."

It is difficult to identify any of these places, as we only know a very few of the pre-Arabic names of the oases. Kufra was called Tazerr, Siwa Santaria, and Jarabub was known as Lakk. Other names are probably hidden in Ptolemy's grecized Lynxama, Lycomedes Lake, and Chelonides Palus. These, by their position, are not unlikely to include Nukheila and Zerzura.

THE ANONYMOUS HISTORY OF SIWA, whose description of Tibbu raids has been mentioned above, also recalls "buried cities, which are not seen except by chance" in the Ard el Ghaffar, South of the Egyptian oases. In the time of Abd el Aziz ibn Merwan, who governed Egypt about A.D. 670, a man looking for the inevitable lost camel found one of these ruined cities, but an expedition fitted out by Abd el Aziz failed to find it. In A.D. 700, Musa ibn Nasr, an astrologer, went seven days South of Siwa and saw a big town with iron gates.

The Ard el Ghaffar is mentioned by other writers, and some put it North and others South-west of Dakhla. It appears on d'Anville's map of 1749 as west of Kharga. The Siwan history describes it as having been rich in "bleleg (gum?), saffron, usfar, and cane sugar," and having a river where travellers could formerly drink for two days' journey. It is tempting to identify this with the Wadi Hawa with its ancient sites.

Whatever be the value of all these tales, they certainly refer to oases other than the known Oases of Dakhla, Siwa, Kharga, etc. And when we realize that Owenat, Arkenu, Wadi Ko'ur, West of Kufra, and Nukheila itself were only found as a result of vague native reports, and that these same native guides have from time to time reported the existence of Zerzura, it ill behoves us to be unduly sceptical. The rock picture at Burg el Tiyyur, in the heart of waterless and unknown desert, still stares us in the face as a proof of the former existence of man not so many miles from where the bulk of the reliable evidence places Zerzura.

We now come to the last and most scientific effort to solve the riddle.

(d) DR. JOHN BALL, Director of Desert Surveys, Egypt, in his articles in the "Geographical Journal" referred to above, after reviewing the historical evidence, discussed the relation of the surface contours of the Libyan Desert to the underground contours of the static water level. It is assumed that the water-supply of the Egyptian oases comes from the North-eastern drainage of the Tibesti and Erdi hills, percolating through the Nubian sandstone, which underlies almost all the south Libyan Desert. A large number of height-readings above sea-level of the ground contours has been made in recent years, and also a number of readings of the static water-levels of various lakes and wells. By the construction of a map, in which the former are super-imposed over the latter, and by drawing in connecting contour lines at 100-metre intervals, Dr. Ball has been able to isolate those areas, where the water-level approaches, or is likely to approach, within 100 metres of the surface contours. He is thus able to narrow down the area in which Zerzura or any water-bearing depression is likely to be. The resulting map shows that, unless the oasis lies in an inconceivably deep depression, it must be found either West of Long. $26^{\circ} 20'$ and North of Lat. 26° , or East of Long. 27° and South of Lat. $23^{\circ} 20'$. The traditions, as stated, refer to more than one place, and it is quite conceivable that at least one oasis may lie in either of these two areas.

It will be noted that the Southern area, with which alone Shaw and I were concerned, accords well with the two traditions: (a) "Murray's Guide," No. 4, *i.e.*, two or three days West of Selima; and (b) Sheikh Fadl el Mula's, *i.e.*, North of Lagia.

Accordingly, after studying Ball's map, we decided to leave Nukheila on a true bearing of about 27° , so as to hit the point on Ball's map where

the 400 metres static water contour and 400 metres surface contour intersected, viz., Lat. $27^{\circ} 10'$, Long. $20^{\circ} 45'$. This involved a curved route from Nukheila to Selima of 290 miles, but enabled us to cut any direct road from Terfawi to Nukheila.

At Camp 39, however, about 22 miles short of the intersection, the aneroid showed us to be still 1,900 feet above sea-level. We had had a fair view to the North from a ridge, as described in the narrative, and had seen no signs of any great alteration in the contours. It was unlikely that the ground would descend 600 feet in 22, or even 50 miles, so we really gave up the quest for Zerzura at this point, and bent our energies on reaching Selima safely.

Unfortunately, Ball had very few points in the Sudan to tie his contours on to, and so his map was largely conjectural East of Long. 26° and South of Lat. 22° , Nukheila being the only water-source whose height had been determined. We had realized this beforehand, but had hoped that the contours would follow his conventional lines.

CONCLUSIONS.

The results of our journey narrow down the Zerzura area still further, and it seems that we must revert to Harding King's 1909 siting, viz., Long. $27^{\circ} 15'$, Lat. $21^{\circ} 30'$, as being now the position which best fits the existing data.

My own views are (a) that while we cannot be even certain of its existence, the balance of the evidence is still slightly in its favour; and (b) that if it exists, it is very probably to be found within a 40-mile radius of this point; (c) that it is not to be confused or identified with Ain Kiyeh, another legendary oasis, which, if it exists, is probably to be found between 35 and 60 miles North-west of Nukheila.

HOW TO FIND IT.

H. J. L. Beadnell, a colleague of Dr. Ball, dug in 1927 a well, now known as Ain Messah (Survey Well) some 18 miles South-South-west of Terfawi, and in the Spring of this year (1928) has begun sinking another in approximately Long. 28° , Lat. $22^{\circ} 14'$. If water is found in the latter it will make a good jumping-off place for a search. In any case Terfawi, where there is fair grazing, would be the best base of operations.

Another feasible plan, and one which would cross one of the two last unknown areas of any size in the Libyan Desert, would be a direct journey of 280-300 miles from Selima to the eastern waterholes of Owenat—a comparatively simple journey with good camels in winter, as the great triple peak of Owenat must be visible from at least two days march away from the East. The route is rather too long to allow of any appreciable diversions, but one would hope to sight *en route* either Zerzura itself or tracks leading to it. Any North and South track should be followed to the North, unless the contours clearly slope down to the South.

An aeroplane that is prepared to go out 150 miles and 150 back, without alighting, from Selima, where an aerodrome could be easily made, might spot the dark vegetation of an oasis against the sand. But visibility in these deserts is bad, and negative evidence would be worth little.

A properly manned and equipped motor convoy of, say, Citroens would probably find good going over most of the area. But a convoy of adequate size would be very expensive. Attempts by two or three Ford cars from Selima would almost surely end in disaster, and, in any case, fail to bring back any scientific results.

As it would be an East to West journey, observations for latitude would only be partially useful. A wireless receiving set for time signals in order to compute longitude would be a necessity if any cartography is to be done. Jebel Kamil, which is 2,600 feet above sea-level, would probably come into sight on the sixth day. It would appear from the South, Dr. Ball tells me, as a very black hill with a sharp peak.

EPILOGUE.

Anyone who has had the patience to read as far as this may ask, "What is the use of it all? Who can possibly benefit from the discovery of Zerzura, or the penetration of barren desert? Is not such expenditure of time and effort pure waste?"

The answer is best recorded in the words of Sir Francis Young-husband, who, when President of the Royal Geographical Society, in 1920, took as the title of his Anniversary Address, "Natural Beauty and

Geographical Science." He spoke at length of the Everest project, and said :—

"We hope within the next few years to hear of a human being standing on the pinnacle of the Earth. If I am asked, What is the use of climbing this highest mountain? I reply, No use at all; no more than kicking a football about, or dancing, or writing a poem, or painting a picture. Climbing Mount Everest will not put a pound into anyone's pocket. It will take a good many pounds out of people's pockets. . . . So there will be no use in climbing Mount Everest. If the ascent is made at all it will be made for the sheer love of the thing, from pure enjoyment—the enjoyment man gets from pitting himself against a big obstacle. But if there is no *use*, there is unquestionably *good* in climbing Mount Everest. The accomplishment of the feat will elevate the human spirit. . . . If man stands on Earth's highest summit he will have an increased pride and confidence in himself in his struggle for ascendancy over matter."

He also laid great stress on the quest for beauty as being not least among the objectives of geographical expeditions. Even the Libyan Desert, which is possibly the most desolate feature of the world's surface, has, like all deserts, its peculiar beauty at certain times of day and seasons of the year.

"Natural Beauty," he said, "is manifested in an innumerable variety of forms. . . . As men have pictured the loveliness of England, the fairness of France, the brilliance of Greece, so we want them to picture the spaciousness of Arabia, the luxuriance of Brazil, and the sublimity of the Himalaya. For not till that has been done will our geography be complete. But when that has been accomplished and the quest for beauty is being pushed to the remotest lands and Earth's furthest corners, our science will have won its final triumph."

THE CULT OF DENG.

By C. A. Willis.

TOWARDS the end of 1927 some excitement was caused amongst the Shilluk by two Nuer, who were practising a cult referred to as the Cult of Deng, and this not unnaturally led to enquiry as to what the Cult of Deng might be, the more so as certain magic-workers, who were believed to put their faith in Deng, were giving considerable trouble amongst the Lau Nuer, *i.e.*, Gwek Wonding, Char Koryom, Pok Karajok, whose activities necessitated the despatch of a patrol.

The word Deng has very wide signification to the Dinka. It is the name of the Son of God, who is the intermediary between man and the universal Spirit; it stands for the firmament, the stars, the rain, the world in general; a madman has Deng, a magician has Deng.

In the sense of Deng as the Son of God, the Cult of Deng must be taken to mean the religion of the Dinka, which is bound up with the tribal organization and custom.

I cannot pretend to give more than a superficial description of this religion from the data at my disposal; but some of the theories put forward show an intriguing parallel to certain aspects of Christianity.

The Ultimate Spirit, who comprises all things, is beyond the knowledge of man, but He is revealed to man through his son Deng. Deng was married to Aciek, a word that simply means woman, and she represents the Universal Mother, and, according to some, is prior to Deng. Deng begat sons, who are regarded as minor spirits or semi-divine messengers of impending sickness or other tribulation; the chief of these are Atem and Awol.

Among the Northern Dinka, who have lost a great deal of their tribal ideas, Atem is only recognized as a sacrifice in the river or atonement.

The knowledge of Deng was not fully revealed until the coming of the legendary hero of the Dinka, Aiwel. He appeared mysteriously, and lived in a humble position until his miraculous gifts proved that he was more than human, and he took over supremacy of the tribe;

and his descendants are the priests, or inheritors of the spirit of Deng. Their function appears to be to carry out the prescribed ritual of Deng, so that God may be pleased and give the tribe health and prosperity.

For instance, certain religious ceremonies are performed in the month of October (Kon); it is really a harvest festival, with dances and sacrifices of bulls and goats. There are also rituals to be performed in April (Alabor) and May (Akoldit) in connection with the rain.

Every section of Dinka has its representative of Deng, the succession is one of blood; it may even be a woman, as it is now with the Ngok Dinka on the Sobat, one Nyajatot Kur of Adong. The most important priest of Deng is Deng Agwer, who lives at Loang Deng, a village in what is now the country of Gawer Nuer, a few miles East of Rufshendol.

There are also sacred spears in each section. The Bor Dinka have a spear called Alan Fio in the custody of Jok Ngong, the Twi Dinka one called Atem, in the custody of Bir Abit, who came into prominence some years ago; the Nyarrewing Dinka have a spear Deng in the custody of Manyok Lwal, and the Dwar Dinka the spears Acyak and Fadiat. The Ngok Dinka have a spear Makwai, which was broken in half, and one half found its way to the Jekaing Nuer on the Sobat, and the other half is in custody of one Deng Dakur of Fanyang, who also migrated to the Jekaing some years ago.

The tribal chiefs are specialized functionaries, who deal with particular matters, and are the right people to perform certain rituals in connection with those matters.

The most important chief is that known as Baing Thiop (equivalent to Nuer Kwer Mon), who is the land chief, and has the privilege of wearing the leopard skin. One of his particular functions is to put the first spear into the bull that is sacrificed when a blood feud is finally settled.

As soon as the leopard chief has stabbed the bull, the young men of both parties set on it and stab it to death in a few seconds. They then tear it limb from limb, removing each his spoils to eat at leisure. It is a grizzly process, but has to be carried out if the feud is to be ended. Blood is only healed by blood.

According to tradition, the tribal chiefs are earlier than Aiwel, because when the semi-divine character of Aiwel was proved by miracles, the chief of the time surrendered his position to him.

Thus the tribal chiefs, whose functions are partly executive and partly ritualistic, may be quite distinct from the descendants of Aiwel, though they are both concerned in their several ways to carry out the ritual of Deng.

There are said to be six kinds of tribal chiefs :—

- (1) Baing Thiop (Nuer Kwer Mon), land and leopard chief. He is looked upon as the most important. He is responsible to see that the proper steps are taken to secure good rains by carrying out the traditional ritual. There are leopard chiefs, *i.e.*, chiefs who can dispose of a blood feud as described above, but are not land chiefs.
- (2) Baing Weng (Nuer Ud Ok), chief of the cattle. He decides when the herds should move from one grazing to another, and in general supervises the welfare of the cattle.
- (3) Baing Tong (Nuer Nyol), war chief.
- (4) Baing Lei. Chief of the hunt. In the Nuer his functions, as do those of No. 6, fall to the Nyol.
- (5) Baing Jwei, Medicine Man, who provides cure for colic or similar troubles. He corresponds to what the Nuer call Tyet, who are doctors, both male and female, and give advice mostly on infantile diseases and sterility.
- (6) Din Yuwar. Protector of fishing.

Of these six chiefs it does not necessarily follow that all are to be found in any section of existing Dinka, though they may be. The first is the most important, and the next two have weight especially among the Nuer.

The influence that the chiefs have is in principle limited to their particular function, and the idea of a Government Chief who represents his section of the tribe to Government and can obtain general obedience in it is an alien idea.

On the other hand, obviously if the land chief can be prevailed upon to strengthen his position or to be bolstered up into a stronger position, he already has some influence over the people. But behind all the chiefs or priests of Deng is the customary tradition on which they depend for their hold over the people.

I append as an example of the faith the paraphrase of a prayer or sacred song :—

Oh, Blessed Deng, we pray to thee.

Oh, Holy Mother, we pray to thee.

Oh, Son of God, send down upon us rain,

Oh, Deng, Blessed Son of God.

Oh, Holy Mother, Light of Light, send down upon us, too, rain. Create and prolong our lives, O, Blessed Deng.

The law of the Dinka has been dealt with exhaustively in Col. H. E. O'Sullivan's "Note on Dinka Law and Customs." He gives, however, an impression of too precise and determined a rule, whereas, in fact, most disputes which are settled under customary law treat the law as a general standard and settle the case by agreement and compromise. Moreover, he omits what, to the native, is as essential to the settlement of cases as the law, namely, the ritual that accompanies the settling of any case.

This is one of the chief points that makes the present system of Chiefs' Courts so much preferable to any attempt by a British Official to administer justice. For however just and proper his decision might be, he could not carry out the proper rites that should go with the execution of the decision and so complete the case.

In fact, it is impossible for the Dinka or Nuer to separate the spiritual and material sides of life, because they are complementary and each requires the other to make a complete whole, and the native, if he tried to distinguish between the spiritual and material, might make some very odd selections.

In theory, at any rate, the Dinka have a connected and organized system of life with a religious basis and a social and moral rule, a priesthood and tribal chiefs whose functions are interdependent and all resting ultimately on the religion of Deng. Unfortunately, this tradition has suffered much from the vicissitudes of the tribe.

The period of the slave raiding and the slave trading, the continuous tribal warfare and the effects of diseases and famine have gone a long way to break up the tribes into disorganized units, with the sense of right and wrong blunted by their desperate needs, and the Dinka perhaps suffered more than any. Placed as they were on the main lines of river, they were the first to fall a prey to the slave raiders who followed the

river route. Moreover, the Dinka were prized as slaves because they were more teachable, amenable and faithful than any others.

At about the same time as the more intensive slave raiding, the Nuer started spreading, drove the Dinka away from their homes or killed or enslaved them. A section like the Nyarrewing, now some few thousand, claims, probably with truth, that it held all the Lau plain and ran to a hundred thousand.

As the Nuer spread Eastwards and Northwards, the Jekaing found a home on both sides of the Sobat, but mainly North of it, extending to the Abyssinian frontier; and there they settled down more or less to their ancient conditions.

The Lau thrust through the plain in which they now live, and absorbed large numbers of the Dinka (the only word for slave they have is "Jange," which is the correct name of the Dinka). The Gawer settled on the Zeraf and started pushing down Southwards into the remnants of the Dinka on that side.

The Jureir section of Dinka, living in the Abwong District, are a typical instance of what happened to the Dinka—Jureir is not a tribal name, but means "outlanders," and they are a mixture of people from different sections driven together for self-protection, but without other common ties, who now are beginning to drift back to their own relations.

It was only to be expected that Dinka, under stress of conquest and slavery, should lose much of their organization, and this has occurred to so great a degree that, in some areas, they have adopted the Nuer custom. Again, the tremendous expansion of the Nuer was not accompanied by a corresponding extension of their tribal organization, and they instinctively picked up local superstitions and customs, and confused the original simplicity of their ideas. Besides that, an opportunity to claim authority arose for any man who could carry it off with some success, even though he had neither the breeding nor the knowledge to justify him.

About the time of the beginning of the Dervish era a number of persons among Dinka and Nuer claimed to be inspired by Deng and offered as proof of that inspiration their power to do miracles, both by healing sick and causing people to die by magic. Having acquired a reputation as magicians whom it was too dangerous to oppose, they collected large herds for themselves and still more increased their influence.

These upstarts, preaching a personal and private Deng, arrogate to themselves the right not merely to adjudicate in disputes and to perform the ritual of specific chiefs, but also to alter the known and established custom to suit themselves. An instance of this occurred towards the end of 1927, when Gwek Wonding adjusted the blood money to be paid for the death of a well-known Chief, Tijok Dula, who was killed about 1912, and ordered the payment of 40 cattle as blood money, instead of the customary 20. Naturally, he got a good share of the surplus; but if the amount of blood money to be paid is to vary according to the caprice of the local magician, the process of law in the Chiefs' Courts would soon become impossible.

Another matter in which Gwek made rules contrary to tribal custom was in the matter of exogamy; and he used to give dispensations to his friends who married within the prohibited kindred. If the tribal custom is to be reversed by the individual magician, there would soon be no common ground on which disputes could be settled.

Several of these self-appointed priests are to be found among the Nuer, and have come into notoriety.

Wonding Dengkur, the father of Gwek, although of Nuer origin, set up as a priest not of Kwoth, the Nuer God, but of Deng, the Dinka God, and he built the pyramid of mud, which was destroyed this year, as a sign of his power. The miracles of healing performed by him and others of his sort are simply conjuring tricks, *e.g.*, producing a piece of stone or charcoal from the seat of pain or a mouthful of blood from the patient's skin without any wound. These tricks have been seen and carefully watched, and in the case of the stone or charcoal it is simply sleight of hand. The mouthful of blood is obtained by a piece of sharp grass which the magician drives into his gums and so obtains blood to spit out; tricks simple enough in themselves, but profoundly impressive to the natives. There is, of course, too, a certain amount of "sympathetic magic," of which the effect is purely psychological. One has, however, to admit a considerable degree of skill to the magicians who perform in public, naked, with only such artifices as they can contrive for themselves with no mechanical assistance.

Gwek, who has succeeded Wonding, was a small "leopard" chief and continued in that capacity till last year, when he set himself up on

a big scale, ran a ritual and a law of his own, and frightened all his neighbours into acquiescence. When it is realized that the natives genuinely believed he could, by his magic, render them impotent, destroy their cattle and women, or even kill them by disease, it is not to be wondered at that they took little or no active part in his removal. Now that he has become a fugitive they are quite grateful.

Another self-inspired prophet of this period was Deng Liker of the Gawer (spirit name Diu) and his two sons have considerable power as his inheritors. Dwal Diu, his son, is the most influential chief of Gawer, but this is in his capacity as a land and fighting chief, and he does not need to base his authority on his father's pretensions as a wizard, though, no doubt, his parentage has some effect.

An instance of the confusion caused by the appearance of these pseudo-prophets has occurred in Gawer this year. Gaabwok Wal was jealous of Dwal Diu and endeavoured to suborn the young fighting men from Dwal Diu by promises of easy loot and immunity from harm; at the same time he took a spirit name Kurbiel Wol, and claimed the usual magical powers in order to terrorize the natives into submission to his will. But for a timely march through the Gawer country by Government troops, Gaabwok Wal would have succeeded in his aims, and, indeed, he was found actually organizing a raid on the Dinka just as the troops arrived to start their march.

Pok Karajok and Char Koryom, who were assisting Gwek in his opposition to Government, have no inherited claim to magical power, but have assumed it themselves, and, like Kurbiel above, are of this generation. These "Kujur" appear sometimes to be epileptics or to reproduce the appearance of epileptic fits. They foam and dribble at the mouth and get a vacant expression, and when in this state are supposed to be possessed by a spirit which is called Deng or Kwoth, as all incomprehensible and supernatural things are called. This does not mean that they are inspired by God, or by Deng garan his son, though some spirit is active in them.

The Nuer mentioned above, like Gwek and Dwal Diu, are men who have a certain position by inheritance, but try to enhance it by assuming powers of magic; but it is not only chiefs who claim to be wizards. Recently a native of the Ngok Dinka was accused of having

caused another to become impotent by magic. Previously he instigated the murder of a useful and loyal chief in order to get rid of him.

It is said that there was a recrudescence of false prophets among the Nuer and Dinka some 10 years ago; the origin of it was said to be the Agar Dinka who had a root, the possession of which, with the proper ritual and conditions, gave the bearer power to perform miracles. It is possible the theory may be mixed up with the trouble of the sacred Lake and "Allah Water" which occurred about that time. It is alleged that the two Nuer who were recently found in the Shilluk country causing trouble belonged to this dispensation.

These two Nuer were independent, but followed similar lines. They had a small semi-circular wall built inside their hut, inside which they would retire to obtain the oracular answer. Applicants would come and state their requirements and the price would be agreed upon and paid. Then, and not till then, the wizard would go into his Holy of Holies and perform with a gourd containing dura and the dried scrotum of a bull with stones in it. I have seen a similar performance with a gourd in the Lau country; groans were emitted from it from time to time, and this is described as the spirit speaking. It is ordinary ventriloquy, and in the case I saw distinctly inferior.

Apart from these articles, these wizards had a mound of bone and ash outside the house, and this mound grew with the importance of the wizard. I can offer no explanation of the mound. Every Dinka and Nuer house has a small mound like a tea cosy with three knobs on it, made of mud, which seems to be the equivalent of the Roman Lar. Until that is in place, it is not a home. There are also mounds of bone and ash over the graves of well-known men, and small offerings of beads or a pipe are often to be found on the mounds to gratify the departed spirit. Again, when a house is struck by lightning, the ruins of it are made into a heap and the bones of anyone killed in it buried under it. It looks very much as if these Nuer in the Shilluk adopted anything that took their fancy and impressed the Shilluk.

One of them had a bodyguard of women who went about with him dressed in a special uniform singing his praises, and incidentally collecting considerable wealth for him. They also seem to have practised similar rites to those described in *Notes and Records* (Vol. IX, p. 65) and got their followers into a state of hysteria.

Their continual demands for women and cattle were making the owners of property annoyed, but the first person to complain was the Ret (King) of the Shilluk, because they claimed the right to settle cases which were his prerogative, and they claimed to do so in the name of Deng instead of Nyakang, who is the God of the Shilluk, and the Ret is the living representative of the Ancestral Spirit who dwells in Nyakang. The doctrine of these Nuer, therefore, struck at the roots of the Ret's authority. He quoted a previous incident in the time of his penultimate predecessor in Dervish days. Three Kujur came preaching Deng, and they urged the people to get rid of their King and come under the new and democratic faith. The Ret sent for them; they were two Nuer, and one, oddly enough, was an Arab. The Nuer were questioned and found guilty of heresy and stabbed to death. The Arab was apparently looked upon as an ordinary cheat, and suffered to go; and he still lives in the Shilluk country.

The wizards were removed at the request of the Ret, and there was a marked increase of respect to the Ret, and a number of Shilluk shrines which had been allowed to fall into disrepair were repaired voluntarily by the natives living near.

The general deductions that can be made from the data available seem to be that, firstly, there is a Cult of Deng or Dinka religion (and *mutatis mutandis*, a Nuer religion) derived through the Son of God and expounded by the tribal hero with a ritual in which the whole native life is involved, with which the chiefs are intimately involved, and from which the chiefs derive their authority. Secondly, there is a system of magic which is, in fact, a combination of ventriloquy, sleight-of-hand and charlatanism, which the natives believe to be of supernatural origin and are prone to submit to, even against their own interests, and this is described as a Cult of Deng.

The confusion between the two cults is only due to the great variety of meaning that can be attached to the word Deng. In fact, the second class is not a cult at all, as is seen by the examples of the Nuer found in the Shilluk, who were mere charlatans putting up a most profitable scheme by using anything that they could think of that would impress the Shilluk, who were unfamiliar with many of their "stunts" and cause them to hand over property to such experts in the occult.

CHAPTER II.

The Dinka of Renk District, living as they did nearest to the Arab, suffered the worst from slave raiding and slave trading; and their tribal organization and custom almost disappeared. Much has been forgotten and much distorted by Arab influence, but the following legend, obtained by Mr. A. P. Cullen, Assistant District Commissioner of the District, largely from Yol Kur, the most important chief of the district and a staunch supporter of the Dinka rights and customs, is of great interest in the side lights it throws on the faith of the Dinka, and their own realization of the abuse of Deng.

A few notes are added at the end on certain points of the legend.

THE WAN DYOR LEGEND.

At Bor there once lived a very old woman whose name is unknown: she lived on fish which she fetched from the river. One day she was splashed by a merman and thus became pregnant, and after eight years gave birth to a son whom she called Aiwel. But her daughter, also very old, would not accept Aiwel as a real brother, saying that her mother had long since passed the age of childbearing.

So Aiwel lived as a poor man amongst the people and was ill-treated by them. The headman of the village, named Fadol, kept him as a herdboys and gave him a cow to share with his own (Fadol's) son. When this cow was milked, the milk used to stream abundantly towards Aiwel's side, a phenomenon which was noticed by Fadol, and he eventually gave the cow to Aiwel. The cow yielded milk continuously till it gave birth to a calf of yellow colour which grew till it became a spotted bull, and the people were amazed, and Aiwel henceforward was known as Aiwel Longar in remembrance of this miracle.

Again, during a period of barren grazing through lack of rain, Fadol's cattle were in charge of Aiwel Longar, and never lacked grazing or water, for Aiwel would beat the ground and grass and water sprang up, while other people's cattle could find none. So one day Fadol, wondering, followed Aiwel as he drove off the cattle as usual, but soon Aiwel caught sight of him, and Fadol at once fell dead. Thereupon Aiwel went to Fadol's son and asked him to revenge his father's death (*i.e.*, asked Fadol's son to kill him), but Fadol's son said "No, you are keeping Fadol's cattle

alive, so have been giving life to Fadol." Aiwel then went and touched Fadol, restoring him to life.

Then they returned to the village and Fadol collected all the herds, and gave to Aiwel a present of two beautiful girls and cattle and relinquished the leadership of the people to him.

Once when out grazing their goats, Aiwel's sons found another herdsman grazing his cattle in the mountains. They bore the news to their father and were told to bring him in. They returned to do so, but the strange herdsman turned himself into a flame of fire. Aiwel's sons retaliated by becoming a sheet of water, which overcame the fire and resolved it into a stone, and themselves regained their natural shape. They brought in this stone to their father who put it in a hut by itself, allowing only girls to enter, telling them to lie down by the stone, and should the stone again become human, the girls were to do whatever it wished. Eventually a most beautiful damsel in her turn entered the hut and the desired metamorphosis occurred. The girl became the herdsman's wife and the pair withdrew to the mountain and the herdsman was given the name of Koor (stone).

Aiwel Longar and Koor were both known to all Dinka as Wan Dyor (blessed men) and their descendants as Man Dyor (sons of blessed men). The offspring of Aiwel now existing among the Dinka are the following groups: Fagag Aiwel, Fagag Ashwai, Fagwek, Fagol, Fakbek, Fagok Fanygor. The offspring of Koor are limited to the group Fakoor. Each branch has a sacred spear originating in Aiwel's family on which oaths may be sworn, the greatest being that of Aiwel himself, now in the hands of Ayong Agwot of the Dunjol Dinka. In the past the Wan Dyor adopted a distinctive dress of leopard skin, but now the Man Dyor lives the simple life of an ordinary man (one man carries on the tradition in each particular division), having in his hut a small pyramid of ash and bones of cattle sacrificed at the weddings of his relatives. His craft consists in faith-cures, and he has no truck with wizardry. He cures barrenness, difficulties in childbearing, infantile diseases and so forth, and occasionally accepts presents of sheep and beads from his grateful clients. He is not in the habit of hearing cases or of any sort of opposition to recognized authority. When he dies, if he has been popular, he is to be buried without any signs of grief and mourning and in a well-known

spot marked with a heap of dust, that people may visit the grave. If unpopular, he is buried privily in a secret place for fear of mischief.

WAN DYOR v. DENG MAN.

In opposition to the Wan Dyor appeared here and there Deng Men. These were opportunists who were out to get cattle and presents from the people by deluding them into the belief that the Deng men were possessed with the spirit of their ancestors. By emitting groans and other unusual sounds, they would collect a large crowd of wondering admirers, and often practise feats of sleight of hand. Thus, if a man came complaining of a pain in his side, the Deng man would go into a trance, and often a series of passes with his hands would produce a stone from the man's body.

The belief in the Deng man was largely induced by fear.

The two Wan Dyor soon disposed of the Deng man of their time. Aiwel Longar particularly devised an admirable way of getting rid of them. He made a large deep hole in the ground, put in it a structure of timber, and on them a huge pot containing lubia-pods and water. He then used to light a fire under the pot and carefully bury the whole. The Deng man was haled along to the place and told to guess what the noise was. If he guessed wrongly he was promptly put to death for not having the magic knowledge which he professed to have. This trial by the pot accounted for all contemporary Deng men except one Abial. He, however, did not greatly oppose Aiwel and Koor.

After Aiwel Longar invaded the Fung Empire, and his son Akwaj Shokab had pursued the enemy as far as the Shidra Mahi Bey, all the Northern Dinka settled down around Kodok.

In the "Turkish" times a Deng man, called Ngor, appeared and took a large number of cattle from the Nuer, but he was caught by a Niel Dinka, who threw him into the forest alive, and when he staggered out he was killed and cut to pieces by them.

Again, another Deng man, called Magar Den or Shol Bex, appeared among the Ngok Dinka on the Sobat, and he was followed by all the Northern Dinka, except the Ab'lang (around Renk). They soon realized they were being cheated, and on leaving again for their own country

they quarrelled with the Ngok over their cattle and had a fight. They returned thus sadder and wiser men, and the Deng man was discredited and reverted to ordinary occupations.

In the time of the Mahdia a Deng man, called Shol Kodit, appeared in the Dunjol Dinka, but was soon discouraged, as also were various Deng men who rose among the Nuer-Dengkor, Diu, Macar and Moding; Deng Kor began the cult of Deng among the Nuer, he himself being a Nuer with a remote Dinka ancestor.

Among the Northern Dinka of Renk District, as far as is known, no Deng men exist, and the cult is regarded unfavourably by the people themselves, who hold to the Aiwel legend.

NOTES.

The distinction between Man Dyor and the Deng Men is extremely curious, as the Man Dyor derive their position from the tutelary hero of the Dinka, whose own history is wrapped up in the true Cult of Deng; obviously, Deng is being used in two different senses.

It seems likely that the distinction is between the hereditary tribal chiefs now only represented to these Dinka by the descendants of Aiwel, and the workers of black magic who are called Deng Men, and particular Deng (spirit) being presumably not the true Deng Dit, but some (evil) spirit.

It is interesting to note that Aiwel Longar, according to the Ngok Dinka legend, was impregnated by a merman up the Sobat, and Aiwel was born between Tubug and Adong, and it was his son Yong who was born at Bor. But these local variations of legend are only to be expected.

The terms Wan Dyor and Man Dyor also provide a problem. Wan Dyor or Ngwat Dyor means "the men of the women," and is applied to the descendants of Aiwel.

The explanation given for this is that they trace their origin to the unknown mother of Aiwel. Man Dyor means "the women of the women," and the explanation given of this is that they are mothers of descendants of Aiwel. This idea of them being blessed must be a gloss from Arab influences.

It is worth noting that the "leopard" chiefs are remembered, but appear to have lost their true significance owing to the weakening of tribal custom from alien influences.

(The "Dengmen" referred to in the penultimate paragraph as discouraged are: Dengkur, the father of Gwek and builder of the pyramid; Diu is the spirit name of Deng Liker referred to on page 201 of this memorandum; Machar is one of his sons. Of Moding there is no record that I can find.)

NOTES ON SOME FALCONS IN THE SUDAN, WITH REFERENCE TO FALCONRY.

By W. Ruttledge.

(WITH PLATE.)

ALTHOUGH falconry is practised by the Arabs in North Africa and South-west Asia, enquiries from various people, who know the Sudan well, have failed to discover any tribe within its borders which indulges in the sport, though a few vague rumours have been heard.

This is most unfortunate for anyone interested in falconry, since he must train a falconer as well as his falcons. There is no lack of suitable falcons, and attempts have been made with varying success by British officials in the past; there may be one or two practising falconry at the present time.

The genus *Falco* is represented by a number of sub-species of the Peregrine, and the type *Falco peregrinus peregrinus* occurs occasionally in the North in the winter. The majority of the sub-species are also winter visitors to the North, and are not very common. One of them, however, the Barbary Falcon, is more abundant, and may breed in the Sudan. Taken all round, the Peregrine and its various sub-species are given pride of place in the esteem of falconers, as possessing in the highest degree those qualities which suit them for the sport, and they would, therefore, best repay training in the open or thin bush country from the Blue Nile Province northwards. Farther South the thick bush or hilly country is less suitable for flying the larger falcons, though they occur there.

The commonest of the larger falcons is the Lanner, of which two sub-species occur. The mediæval falconers in Europe found it worth while to import this falcon, but it had the reputation of being lazy. It often frequents villages, dashing in at high speed from some point of vantage outside, and boldly carrying off small chickens, etc. The other common falcon of practical use is the Red-headed Merlin, which usually haunts palm trees along the river and elsewhere.

Other falcons of rare winter occurrence are the Saker and the European Merlin. The former, somewhat similar to the Lanner but

larger, is trained by the Arabs in North Africa to assist in the capture of gazelle and bustard, which are hampered by its stoops, and taken by dogs following behind—not the highest form of falconry.

All these falcons adopt habits similar to the Lanner in places where water is scarce, and birds collect in numbers at water-holes. A swift, low rush, and if this is unsuccessful the falcon returns to its look-out on some rock or large tree, to repeat the procedure a few minutes later. A long sustained flight is not often seen, though the writer has witnessed a Lanner kill a cattle egret, and, judging by the latter's tired condition, it must have been flown some distance. A pair of peregrines of some small sub-species were seen to ring up and stoop alternately at a swallow—small game for them—and a pair of Red-headed Merlins did the same with a sand-martin, but gave up though still on terms with it.

When a flight of locusts or winged white ants appears, even the peregrine will take them on the wing and eat them in mid-air. In March, 1926, when there were a few locusts near Port Sudan, a male Lanner followed the writer on one occasion when riding a camel, which disturbed the locusts. The Lanner took them so close that it would have been almost possible to hit him with a kurbag.

The roosting-places of flocks of sparrows and weaver birds are haunted by all kinds of birds of prey, which have been seen to take advantage of the weaver birds when the flock dips into the river to drink—a case of "divil take the hindmost" off the water.

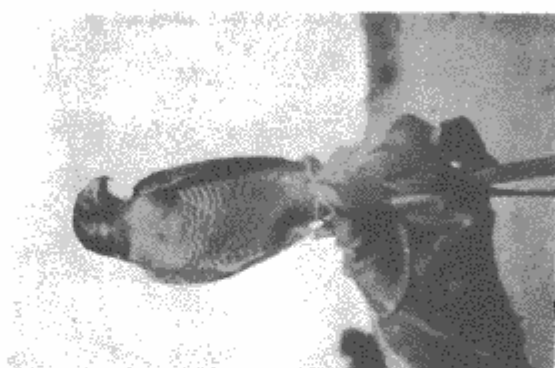
Apart from the falcons, there are a few hawks which might be trained. Of these, the Wedge-tailed Goshawk is a common resident. In size it is rather smaller than the European Sparrowhawk, which also occurs in winter. Both these could be flown in more wooded country than the long-winged falcons. The three species of Chanting Goshawk are distinguished from the true Goshawks by having red legs and a dark-coloured eye. They would probably not repay training. There are one or two eagles for anyone who cared to try them, but their powers of fasting make it difficult to get them keen to come to the trainer for their food; an essential part of the education of any bird to be used in falconry.

In very unsuitable country for long-winged falcons the writer has had some slight experience during the past year in methods of snaring wild falcons and in their training up to a certain point. The first attempt

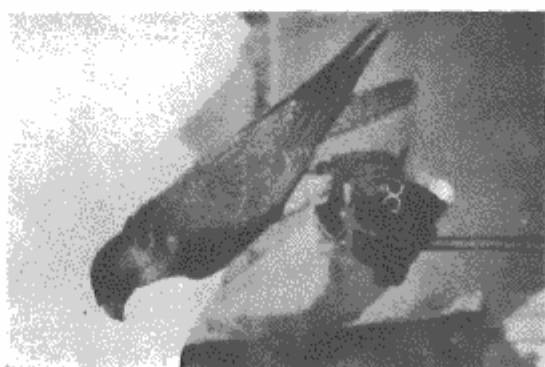
SUDAN NOTES AND RECORDS.



LANNER.



RED-HEADED MERLIN.



BABY COMAN PEREGRINE.

was made with a Red-headed Merlin, caught by a somewhat laborious method entailing the pulling of a string to enclose in a net both the falcon and a bait, which had to pay the penalty. A native was employed and trained to some degree of efficiency with this hawk. After six weeks she was flying loose at exercise twice a day, and stooping at the lure for several minutes on end. This was continued for about a fortnight to get her fit in wind and muscle. She was entered at a bagged dove, which she flew and took keenly, and was to be flown at a wild one next evening. The following morning, however, while she was at exercise, a wild Lanner drove her from the lure and pursued her out of sight in the bush and broken country, where she must have become independent at once, for she was not seen again.

For several months the native falconer tried for Merlins and Lanners without success, though he took about 20 various birds of prey, including several Booted Eagles, two of the last at once on one occasion. The best method was found to be a vertical net four feet high by six feet long, set up near the required birds with a live bait beyond it. The bird does not see the net, and, striking it, the latter collapses and enfolds it.

Eventually two Lanners came together to the bait and were taken, but the male was released. Later on another Lanner, another Merlin, and a Babylonian Peregrine (Red Naped Shaheen) were taken with the same device.

The larger falcons take much longer to lose their fear of man and to learn to fly on a line to the falconer's fist or to the lure for food. The Lanner proved more difficult in the latter exercise than the Peregrine. Progress has been rather slow with all these falcons, as the native falconer has been in sole charge most of the time. Moreover, though each has its attendant boy, the time for exercise and training to the lure is limited by the temperature—an hour or two in the early morning and rather less in the evening. This being so, two or at most three trained falcons would be as much as one could do justice to in giving them each enough flights at whatever quarry may be selected.

The matter of suitable quarry has yet to be decided, and will depend on the species of falcon, the type of country and the abundance of any particular bird which might afford a flight.

Peregrines and Lanners should be tried in open country at sandgrouse and various species of plover and, perhaps, at the Little Bustard (Senegal

Bustard). A well-trained Peregrine Falcon should take duck also if in small isolated pools. The black-and-white crow should succumb to two Peregrines or Lanners, but is probably too powerful for one alone. For the Merlin there are various birds up to its own size, preferably such as would give a ringing flight where the country is open. In thin bush there would be several species of doves and quail wherever they occur in sufficient numbers. Falcons, as opposed to hawks, should be kept to one species of quarry at any given time. Hawks need not be, but the Wedge-tailed Goshawk could be well supplied with flights even if restricted to doves and quail.

THE NAHĀS OF THE KABABISH

as told by Sheikh Ibrahim Faheil.

(WITH PLATE.)

NOTE.—The following story of the Nahās of the Kababish was told me by Sheikh Ibrahim Faheil, uncle of the present Nazir, Sheikh Sir Ali El Tom. The drums in question were beaten in my honour during a recent visit to Hamra El Sheikh, and I was able to take the accompanying photograph.

The "bull" is on the left-hand side of the picture, then "the cow" and "calves."

For an historical account of the death of Salih Bey Fadlulla and for details of other tribal notabilities mentioned, the reader is referred to "Tribes of Northern and Central Kordofan," page 194, by H. A. MacMichael. J. A. de C. H.

THE *Nahās* consisted of four drums, the "bull," the "cow" and "two calves." Of these, only the bull is of the original set belonging to Fadlulla Bey Salim, the grandfather of Sheikh Sir Ali El Tom, and it has had a strange story.

When Fadlulla Bey Salim died, the *Nahās* became the property of Sheikh El Tom Fadlulla, his son. At the outbreak of the Mahdia, Sheikh El Tom remained faithful to the Government, but in the hostilities which followed he fell into the hands of the dervishes. Just before he was taken prisoner, he sent a messenger to his trusted servant, Bakheit Wad El Nuba, telling him to take his son Mohammad, his camels and the *Nahās* to El Safia, where his brother, Salih Bey Fadlulla, was to be found. These orders the faithful Bakheit carried out, and after joining Salih Bey Fadlulla at El Safia, the whole party moved off northwards with a view to seeking Government protection in Dongola.

When they reached Jebel Audun, Salih Bey Fadlulla, with the help of some slaves, took the *Nahās* and buried them in the side of the hill. This was in the year 1302 A.H. (1884).

After this Salih Bey and his party settled for a time at El Rijl, in Dongola Province, which was then free of dervishes. Later, however, one Mohammad Kheir appeared and governed Dongola on behalf of the Mahdia, and on account of this Salih moved away into the desert in the direction of Um Badr.

When the Khalifa, who had succeeded the Mahdi, got news of his whereabouts, he ordered the Emir Othman Wad Adam to capture him. In accordance with his orders the Emir sent a large force to Um Badr and a bloody fight took place, in which most of the Kababish were slain, including the trusty Bakheit Wad El Nuba.

Salih Bey with the survivors retreated to El Ain, but was pursued and captured. He was ordered to disclose the hiding-place of the *Nahās*, but he refused. His head was cut off and sent to the Khalifa at Omdurman.

Later the dervishes heard that the *Nahās* were in Jebel Audun, and the Khalifa sent a party from Dongola to search for them, but no trace could be found.

As all the persons who had taken part in concealing them had been killed, no living person knew the secret, and it was feared they were irretrievably lost.

But in the year 1320 A.H. (1902), during the Kharif, a Kabashi of the Ghilayān Section, Abdulla Dugushein by name, was riding past the Jebel when he saw a big drum caught up in a tree at the bottom of the slope. He examined it carefully and went off and brought his Sheikh who identified it as the "bull." He took it down from the tree, into which it had probably been pitched by a rain storm washing it out of its hiding-place, and then and there slaughtered an ox as a thank-offering.

Abdulla Dugushein went off to carry the good news to Sheikh Ali El Tom, then camped at El Hireiz.

On approaching the Sheikh, Abdulla, who saw a chance of turning his discovery to his own advantage, demanded large *Bushāra*. "What do you want?" enquired Sheikh Ali. "I want exemption from taxes for ever," said the resourceful Abdulla. "This I cannot grant," replied the Sheikh, "as taxes belong to Government;" but he promised Abdulla a good reward. Whereupon Abdulla told the news, but what he received as reward is not now known.

The "bull" was brought in and, though much battered, was set up and a new skin stretched across.

The drum was beaten amidst great rejoicing and a further ox was slaughtered.

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After this, Sheikh Ali went to El Obeid and informed Mahon Pasha of the good news and requested the Government to allow him to make the set complete.

Permission was granted, and Sheikh Mohammad El Tom went to Khartoum taking with him the long lost " bull " for repair.

This was duly accomplished, and through the good offices of the Government a " cow " and two " calves " were forthcoming.

Sheikh Mohammad El Tom returned to El Obeid with the now completed set, and since that date these have been the official *Nahās* of the Kababish.

A BIBLIOGRAPHY OF THE LANGUAGES OF THE SOUTHERN SUDAN.

By Professor Dr. Bernhard Struck.

NOTE.—The linguistic bibliography of the Southern Sudan, compiled by Professor Bernhard Struck, of Dresden, was intended as a supplement to the list of vernacular literature printed as an appendix to the official report on the Language Conference held at Rejaf in April, 1928. As it was impossible, for various reasons, to publish it in that place, it is reproduced here with the permission of the author, to whom the Editors are greatly indebted. Professor Struck desires to point out that the list does not lay claim to completeness, and that it should be used with the reservation "*sub beneficio inventarii*."

As all students of the subject know, there are still certain doubtful points in the nomenclature of southern tribes and dialects, and such uncertainties necessarily present a difficulty to the bibliographer who may be unaware of the fact that two or more names used in different publications in reality refer to one and the same language. Thus it appears possible that Ndogo and Shaire (Shere), which are referred to as separate languages in the report (p. 42), are identical, while, on the other hand, the term Moru is used as the name of two and possibly three distinct idioms.

The following points should, therefore, be borne in mind in using the bibliography:—

Under No. 4 (Luo) only the northern so-called Luo dialects have been entered, *i.e.*, the language of the Yur of Wau District, that of the Shilluk-speaking Bolanda, and that of the Ber of Mundo. Under No. 10 (Moru) all publications using that name have been enumerated without any attempt at distinction between the different languages for which this designation is used.

Under No. 5 (Bangala) and No. 13 (Sudan-Arabic) the compiler has confined himself to grammars and vocabularies of the pidgin-forms of these languages to the exclusion of other publications which leave it uncertain, whether they treat of the correct forms or of the pidgin-languages.

With regard to No. 15 (General) it may be pointed out that this section contains much that is of greater value for the scientific study of the subject than most of the monographs on the separate languages.

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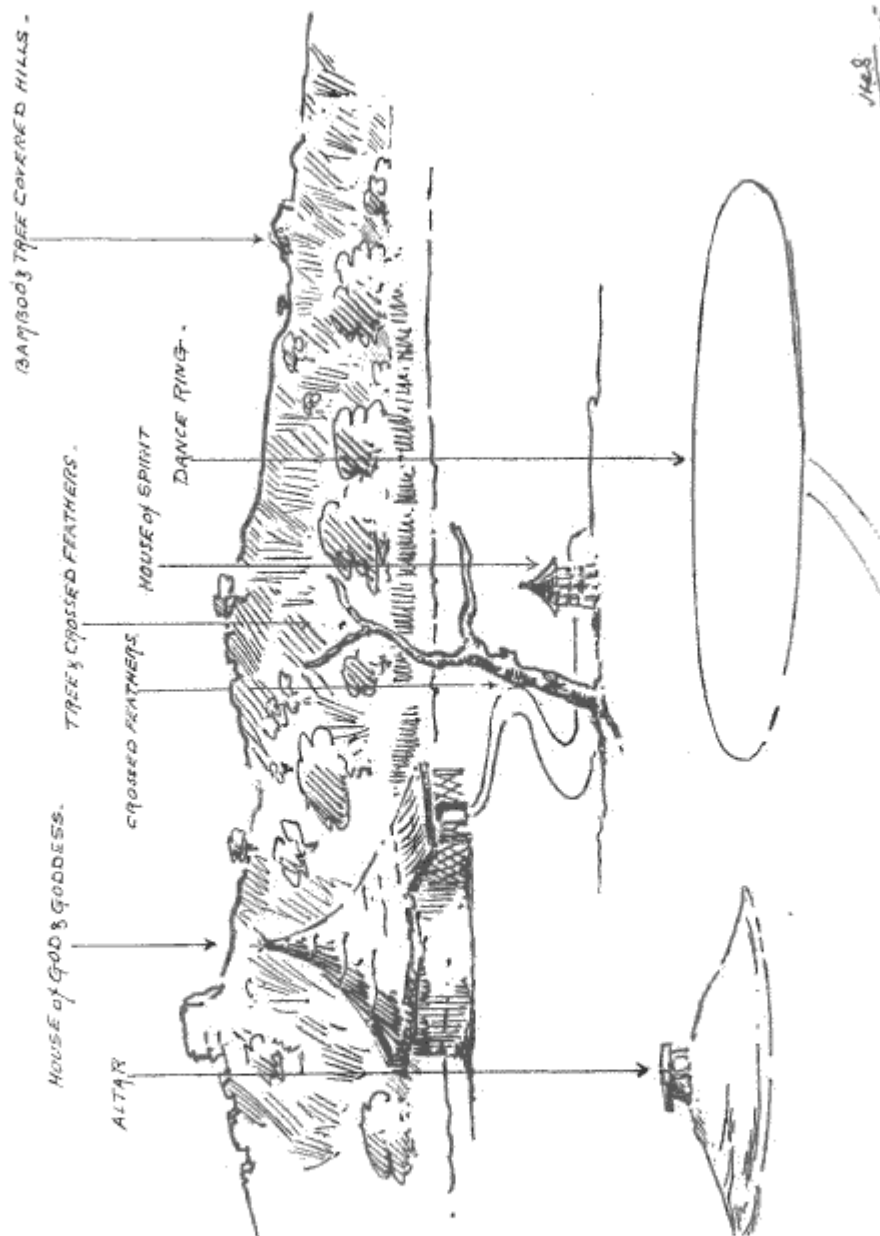


FIG. 1.-GENERAL VIEW OF REPAF TOWN, SHOWING HOUSES, ETC.

MS. 1314.

NOTES.

Religious Practices in Rejaf District.

(PLATES I—III.)

THE sketches reproduced herewith were made in 1914 by Bimbashi H. Castle-Smith, at that time Inspector Rejaf, to illustrate a report on the capture of a "God and Goddess," whose practices were disturbing the tranquillity of the district. The report does not make any mention of the tribe, amongst whom these deities functioned, but the locality (roughly 17 miles due south of Loka) suggests that the people concerned were Nyangbara or Fajelu. The following extracts from Bimbashi Castle-Smith's report contain the little that is known of these Gods or Devil Gods (as they are called in the report), and it is hoped that the publication of this note may lead to enquiries and fuller information about similar practices in the district referred to.

"The house of the God and Goddess was situated facing east at the bottom of a range of low hills near Lokari'a village, the hills being beautifully wooded with patches of bamboo here and there, varied with bold headlands of rocks and crags. It was far larger and better built than most native houses and had a large porch closed in with bamboo trellis work; the walls inside were plastered with mud and contained rude drawings in white ash of figures of men and animals, some of them obscene. Several small *burmas* containing native herbs for incantations, and three magic wands or *Kujur* sticks were found. Outside the house was a withered tree on which were tied two crossed white feathers which none of the local natives would touch; at its foot was a small coop-like structure of open-work bamboo containing a small vessel of water with some dura in it. This, I was told, was intended to feed the spirit which the God and Goddess invoked. (Fig. 1). In front of this tree, about 20 yards away, was a beautifully cleared, mud-plastered circle, about 100 yards in diameter, on which dances in honour of the God and Goddess took place. A little further on was a space, 150 yards long by 50 yards wide, on which armed parades in honour of the God were held; at one side was a small mound on which was an altar where hens and goats

were sacrificed. (Fig. 2). This altar consisted of five stones as supports, and a flat stone as a table on the top. In the hollow space underneath was a small *burma* containing a magic potion made with herbs (Fig. 3). All these spaces showed unusual care in construction, clearing and laying-out in striking contrast to the ordinary lazy methods of the Lado natives."

The house and altar were destroyed and the dancing and parade ground dug up, in order to demonstrate the falseness of the supernatural claims of the local "God," and this action is said to have the desired effect.

The Name Mongalla.

THE extract here reproduced from an old file is of some interest as illustrating the haphazard manner in which place names may come into being and gain universal acceptance in spite of the fact that they were, in the first instance, based on a misunderstanding. In September, 1901, the officer in charge of Mongalla wrote as follows in answer to an enquiry as to the origin of the name :—

"I do not know why the Post ever came to be christened *Mongalla*.

"In the first there is no such place up here. There is a village called Mongra (perhaps better spelt *Mongarra*, with accent on first syllable), about seven miles to the South of the Post.

"This is the village Mr. Spire incorrectly calls *Mongalla*, and when Bimbashi Whishaw went up to Gondokoro in the Dal he got this name and brought it down to Omdurman. I have taken the greatest trouble to get all names of places with pronunciation quite correct. I have questioned many natives on the subject and cannot find a single native who calls this village *Mongalla*—all persist it has only one name, viz., *Mongarra*. In any case either of these names is incorrect when applied to our Post, which the natives all call *Ligarri* (Bari) or *M'Nikla*, the latter a corruption of the old Dervish name for their post there, i.e., *Um El Nikla*. I am perfectly certain of the foregoing beyond the shadow of a doubt—I know all the villages and the chief natives in each for some

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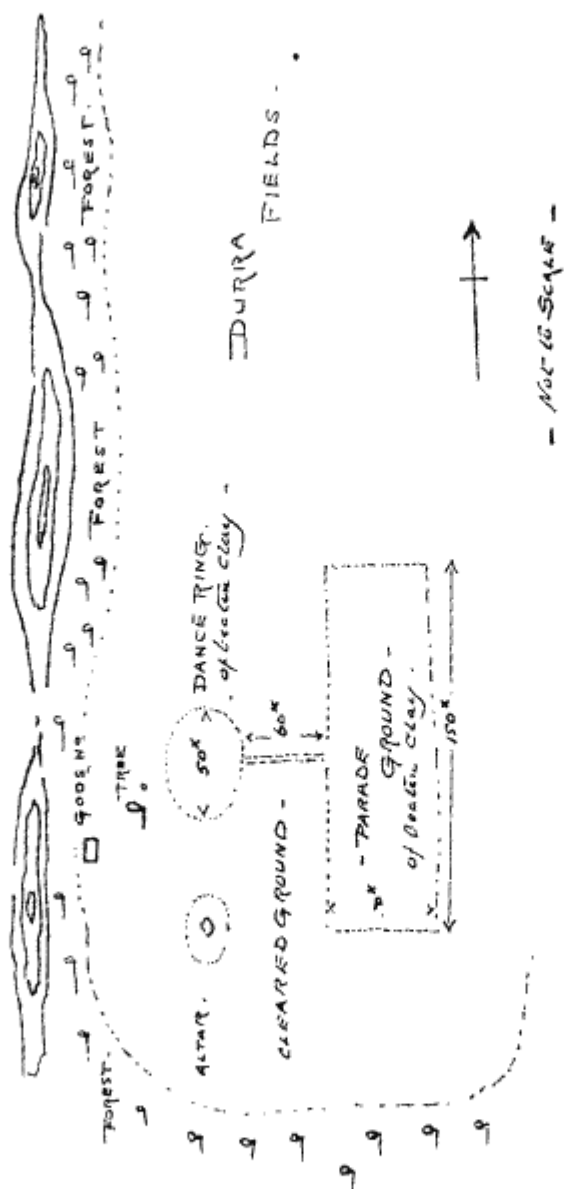
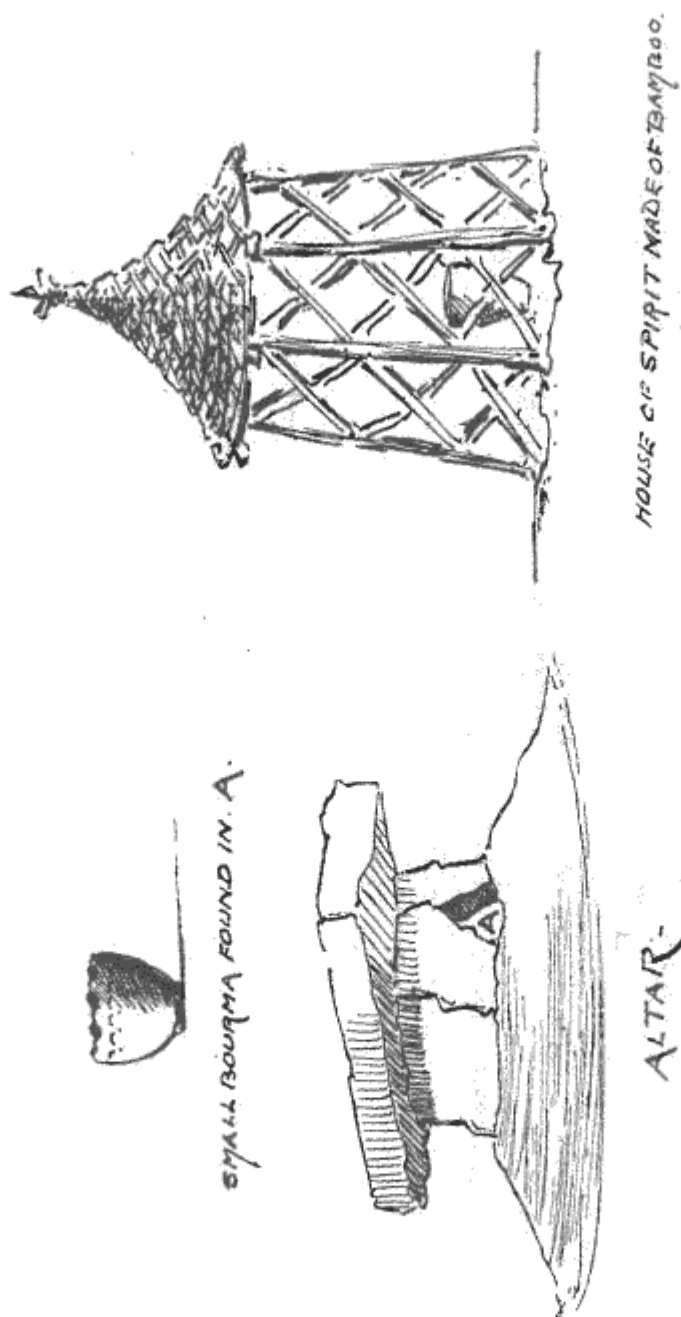


FIG. 4. PLAN OF FIG. 1.



W. H. Smith
Aug. 1914

FIG. 3.—DETAILS OF SPIRIT'S HOUSE, ALTAR, ETC.

miles in all directions from our Post and have visited them over and over again. These people also come in to see me periodically.

"Mr. Spires' information has been gained from natives around Gondokoro. In this country natives rarely know anything about the country or people ten or fifteen miles away. So it is not easy to obtain exact information except on the very spot.

"The site of our Post will be found on the Uganda Map, recently issued, at the spot marked *Jonga or Um el Nikla*. I am told Jonga was the name of a chief who died many years ago—so long ago, in fact, that nowadays only about two people had ever heard of him. There is now no village nearer our Post than *Mongarra*, to the South, and a village about the same distance to the North. This is known as Lado's village from the name of its head man."

CORRESPONDENCE.

THE KAKAR OF THE FUNG.

To the Editor, "SUDAN NOTES AND RECORDS."

Can any of your readers throw any light upon the *kakar* or royal throne of the Fung?

Some years ago it was described to me as a very shoddy arrangement, varying from ten to twenty feet in height according to the enterprise of the speaker. But about the year 1919 Sheikh Abd el Bagi, of Tayiba, told me that he had had one in his possession for a good many years. This was not then on view, but from the description he gave of it it sounded suspiciously like the ordinary Abyssinian stool of some eighteen inches in height. If so, is there any connection between the Fung *kakar* and the royal stool of the Anyuak?

The Shilluk and Anyuak appear to be racially and linguistically akin, and there are many of the more enlightened natives of the southern Sudan who insist that the Fung and Shilluk are related. Certainly of all the peoples in the south the Fung and Shilluk alone seem to have had any real sense of organization and internal discipline. Even the Avungara were a dominant caste rather than the imperial rulers of a tribal entity.

It is a strange coincidence that the time when the Fung consolidated their power in the central Sudan corresponded with the extension of Shilluk influence up to the neighbourhood of Goz Abu Gumaa.

Another point of contact is furnished by the two drums of the Anyuak (described in Vol. VII, No. 2, of SUDAN NOTES AND RECORDS) and the two drums, Dingil and Tor el Nahas, that were used at the installation of the Fung chiefs.

H. C. J.

THE JUR.

To the Editor, "SUDAN NOTES AND RECORDS."

In Vol. VII, No. 2, of SUDAN NOTES AND RECORDS, appeared an interesting article on the Jur. May I ask who these so-called Jurs are and what are their tribal limits?

I spent but a few days amongst them in the Bahr el Ghazal, but I understand that the name Jur is a nickname (I fancy of Dinka origin) which simply means stranger, and is similar to the Shilluk term, *bang*.

The Arabs and Nuer are, I know, called Jur by some sections of the Dinka, though the name is qualified by some such addition as Matiang, which, as far as my memory serves me, means the "horsemen strangers," *i.e.*, the Rizeigat.

There is the further fact that the present merkaz of Tonj is, I believe, built on or near the *zeriba* of the slavedealer Ghattas, and in many old maps this place appears as Jur Ghattas.

Was your correspondent referring to the people who, there is some reason to believe, may either have been ethnically akin to the Shilluks or possibly have been their slaves? If so, what is the name by which the elders of the tribe originally referred to themselves?

The point should be cleared up, as we are in danger of losing sight of their ethnic origin, more especially as the word itself is now becoming Arabicised, and a native of the tribe is apt to call himself a Jurawi.

There are several different so-called Jur peoples whose language is mutually unintelligible.

H. C. J.

REVIEWS.

By A. D. Home.

"SEVEN YEARS IN SOUTHERN ABYSSINIA."

"SEVEN Years in Southern Abyssinia," by Mr. Arnold Hodson, C.M.G., lately one of His Britannic Majesty's Consuls in Ethiopia (T. Fisher Unwin, 18s. net), will interest all those who have been connected with that country or her frontiers.

Abyssinia is an island of Christianity in a world of Islam or paganism, with a Church dating from early in the 4th century. She occupies a unique position among the countries of the Near East.

The author's portraits of the characters of Abyssinian officials show their subtlety. They are not accustomed to putting in plain, precise language exactly what they mean and nothing more. The Abyssinian mind delights to clothe its thoughts in ambiguous words, deliberately intended to confuse and lead astray the seeker after their exact meaning. The practice of make-believe is reduced to a fine art, and has become second nature. When a European who had suffered from it became angry, the Abyssinian concerned asked the former's interpreter, "Why has this European come so far from his country to lose his temper here?"

Abyssinia claims equality with the West, but one of the hardest changes to make will be that of thinking and dealing with things as they are instead of as one might wish them to be. Yet in large measure this make-believe springs originally from an innate observance of rules of courtesy. The Westerner's efforts to come to close grips with a subject that the Abyssinian wishes to keep at arm's length tempt the latter to pile the make-believe still higher.

It is no use expecting Abyssinians to be Europeans. They have as much right to do things in their African way as we have to act like Europeans. There are standards of right and wrong, against which neither may transgress—but for the rest, nothing can be done. Sympathy alone will attract confidence. You cannot know the Abyssinians until you know their language. To learn another people's language is to see all things from a different view-point, and the more different the language the more difficult the point of view.

Local prejudice, taste and sentiment, religious beliefs, and social customs must be very carefully studied by those who wish to work in the country successfully.

Absolute government is the natural organization of society in Abyssinia. The Abyssinians have advanced but little in the last 1,000 years. They have a bad system of currency, primitive laws, and faulty methods of administration. The average Abyssinian has no real regard for efficiency, especially if he has to pay taxes for it.

Their Civil and Ecclesiastical Code is known as the Fatha Nagast, or Imperial Decisions. They are stated to be of Arab origin and date from the 13th century. Traces of the influence of Roman Law are obvious in it. Some of its clauses are adhered to, but the majority have sunk into oblivion. The duties of Consuls in Abyssinia are more administrative and judicial than in ordinary countries. There is, however, no assumption that we are yet within reaching distance of abandoning extra-territoriality, but the tendency will be towards ultimate abandonment of these special privileges. Codification of the law to be administered within the Abyssinian Empire would be a first step, and then an agreement that this code, and not the varying systems of foreign powers, should be administered, whether by Consular officers having jurisdiction over their own nationals or by special Courts or by Abyssinian Judges. The gradual transfer of judicial authority to Abyssinia might thus be contrived through a period of transition and with the minimum of danger to the rights of foreign residents.

The author states that Addis Ababa was founded by the Emperor Menelik in 1892, and "with that its claims to modernity are exhausted." It has, however, changed since Mr. Hodson's last visit, for there are now hundreds of motor cars using the few roads in the Capital. The representative of an Oriental Power spoke to the reviewer of the difficulty of getting good servants, and said that one of his house servants had recently taken his wages and gone. On the next day he was seen driving up and down the main street in a hired motor car with a "fille joyeuse," and so spending his savings. The site was chosen by Menelik's imperious Consort, the Empress Taitu, and named by her "New Flower" (Addis Ababa). She was comparable to the Dowager Empress of China. An incident is recalled of her, with women attendants, being in the Gibbi (palace) grounds one day in 1910, when Menelik had become too paralysed

to rule and she was a semi-prisoner. The French military doctor, attached to the Abyssinian Government, chanced to meet her. He was poetically minded, and, after making his salutations, said, "I see your Majesty surrounded by your flowers," to which she replied, "Yes, would you like to smell them?"

It is said that the Emperor Theodore's madness was partially caused by grief at the loss of his friends, Mr. Walter Plowden, H.B.M. Consul at Gondar, in the "fifties" of the 19th century, who was speared by rebels near Gondar, and Captain John Bell, another Englishman, who was in Theodore's service, and gave his life soon afterwards to save the Emperor from a rebel spear thrust. When Napier's force had reached the heights of Magdala in 1868, Theodore committed suicide with a pistol which had been sent to him as a present from Queen Victoria.

The author falls into the usual error of calling Ras Taffari "Heir-Apparent." In fact, there are several members of the reigning house senior by blood to the throne than His Highness. They include Ras Kassa, G.C.V.O., Governor of Sillali, Dejazmach Taiye, Governor of Gimirra, and Dejazmach Beru, Governor of Gedami. Ras Taffari, like them, is a second cousin of the Empress, each of them being similarly related to one another. All of the persons named are great-grandchildren of Sahala Sillasse, King of Shoa. The House of Shoa did not obtain the Imperial Throne until the death of the Emperor John at Gallabat in 1889, when fighting against the Derwishes. Menelik, King of Shoa, took the opportunity to declare himself Emperor, John having no legitimate son. Ras Taffari was elected "Heir to the Throne" when Lij Yasu, one of the potentates who lost their thrones in the Great War, was replaced by his aunt Zauditu in 1916. The Empress Zauditu is childless; her husband, Ras Gugsu Wolye, Governor of Gondar, was her first husband. A divorce was effected, and she made two subsequent marriages, finally re-marrying her first husband.

Mr. Hodson mentions that he was not allowed to fly the Consular flag from a staff in his grounds, and had to affix it to the Consulate. This springs from the unwillingness of the Abyssinians to let a foreign Government acquire property. It may be recalled that British law does not permit of a foreign Government's acquiring freehold property in England. It was the practice for the Russian Ambassador to obtain a lease of the Embassy building in London in its own name.

It is probable that the natives of Southern Abyssinia will long recall the Englishman who was often wont, when on tour, to walk apart from his caravan wearing a dungaree suit, using a golf club, and accompanied by a small boy leading a goat. It was our author, practising golf shots along the route, and refreshing himself, when required, with the milk of the goat.

The numerous photographs are good. The small sketch map of the colonial area of the Abyssinian Empire in which Mr. Hodson's duties lay is inadequate and incomplete.

L'ISLAM ET LA POLITIQUE CONTEMPORAINE.

Librairie Felix Alcan. (Price 12 francs.)

THIS publication comprises a number of addresses delivered at a conference organized by the Société des Sciences Politiques at Paris in 1927. The speakers are all persons of eminence either in the world of affairs or of letters, and the book as a whole can therefore be taken to present the best French opinion on the subject.

The first two contributions are by M. Gaudefroy-Demombynes and Marshal Lyautey. The latter confines himself to a few generalities, pleading that the subject is too controversial for an official as intimately connected as himself. He expresses however his agreement with the general conclusion of M. Demombynes, who, after a scholarly review of Islamic history and principles, gives as his opinion that Islam is capable of adjusting itself to new conditions, and that the generally accepted idea of its solidarity is largely a myth.

These introductory addresses form a useful background for the regional surveys which follow, and which bear out the second conclusion to a large extent. As regards the first, however, the question is rather whether a changed Islam is any longer Islam, and it would have been more convincing if the speaker had shown how this adjustment could and would take place.

The first regional survey deals with the Far East and M. Granet has some interesting things to say on the relations existing between the Moslems and the Dutch in Java and Sumatra. It would appear that the forty-three millions of the Faithful found there, constitute one of the most active centres of present-day Islam. This is probably accounted for by its comparatively late conversion and present-day close contact with the Hedjaz through its pilgrims. It is also interesting to note the close connection between the growth of a seditious Moslem proletariat and the alienation of land to plantation companies.

In view of the growing importance of Singapore and its Straits, this group is likely to play a larger part in the future.

The Moslems in China, who are estimated at some ten millions, appear to be a somewhat moribund group owing to their being swamped in a sea of Chinese and to lack of outside stimulus. They play however a considerable part in local politics, as they serve as mercenaries in the various armies operating in China.

M. Paul Boyer's address in this section is of first-class importance, as he throws much light on Russia's dealing with her Moslem subjects since the Revolution. He points out that, owing to racial affinities and geographical propinquity, Russia is most favourably situated for influencing the Moslems of Central Asia, and that she has not missed her opportunities. Her method has been to grant a large measure of local liberty of government, whilst at the same time retaining all real power in the hands of Moscow. At the same time however she has made great efforts to study them ethnologically, and has been carrying out an intensive campaign of cultural penetration.

In M. Boyer's opinion, Russia's hold materially, morally and culturally in Central Asia is as strong, if not stronger, than that of Czarist Russia. But in any consideration of this part of the Islamic world it must be remembered that you only have to scratch a Russian to find a Tartar, and that there is no hard-and-fast racial barrier between the two peoples.

The Near Eastern section of this book is of special interest, as it is in this quarter that so much misunderstanding has occurred between the British and French Governments.

But M. René Pinon hardly helps towards a better feeling. In every British action he sees some deep-laid plot, and in the Arab revolt an intrigue

inspired by "un certain Lawrence improvisé Colonel" to bring about British domination over all the countries lying between Egypt and India.

It is also interesting to read the French version of the Chanak affair and the statement that the Mudania armistice was largely the outcome of M. Poincaré's wisdom would seem to require more detailed explanation.

M. Pinon gives a well-balanced account of the rebirth of the Turkish nation, but it is difficult to agree with his dictum that "*la Turquie, comme la Russe, se reasiatise.*" It would seem rather that she is doing exactly the opposite.

As regards Palestine, he has some hard things to say, but is discreetly silent about Syrian affairs.

It is refreshing, after the sinister interpretations of M. Pinon, to read General Weygand's clear and soldierly account of the frustration of King Hussein's intrigues in Syria. It is a fair surmise that had General Weygand remained there to give her a strong guiding hand many of the distressing events of recent years would not have occurred.

As regards French North Africa, both M. Augustin Bernard and M. Jules Cambon are agreed that the French occupation strengthened at first the influence of Islam locally. But it is obvious that, whilst Islam may still be useful as a call to arms, the real forces now active are nationalistic rather than religious, and France's present task is how to turn these to her advantage rather than her detriment.

The volume concludes with two addresses on the general political relationship of Islam with European powers, and on this M. Massignon speaks with knowledge and detachment. After a survey of relative Moslem populations, which gives a bedrock of fact to his views, he traces the causes which he says have been slowly undermining Islamic vitality since the sixteenth century and gives in detail the inroads which modern thought is making in customs and doctrine.

The Comte de Saint-Aulaire, whose address closes the proceedings, makes up for the previous speaker's close adherence to fact by an eloquent appeal to other nations to follow France's leadership in these matters, and, having proved to his own satisfaction that France's honour is always engaged on the side of her material interests, he adds ingenuously "*et l'honneur est toujours le premier des intérêts.*" (Applaudissements)."

The impression which remains after a study of these addresses is that the whole question is, perhaps, now only of secondary importance. It

is in fact fairly clear that Islam as a force in world politics is losing ground. The young Turks knew this before the Great War and changed their policy from a Pan-Islamic to a Pan-Turanian complexion. Mustafa Kemal has carried out this policy to its logical conclusion, and has recently disestablished it as the state religion.

The muezzins of Fez, Cairo and Baghdad may continue to call from their minarets, but their voices will be increasingly drowned by the roar of the aeroplanes above them and of the motors in the street. These are the forces which are changing the face of the Moslem world, and it is to the new problems raised by them that attention must now be turned.

J. A. de C. H.

OBITUARY.

Captain V. H. Fergusson.

OWING to various causes it was not possible, unfortunately, in the last issue to make any reference to the death of the late Captain V. H. Fergusson, O.B.E., who was treacherously murdered by Nuers at Lake Jou, Bahr-el-Ghazal Province, on the 14th December, 1927. We therefore take this opportunity of expressing our deep sympathy with the parents and relations of the late Captain Fergusson, and our great regret at the sad loss of one who from time to time sent us very interesting articles on Nuer folk-lore and tales.

Captain Vere Henry Fergusson was the only son of Colonel W. S. Fergusson, C.M.G. (late King's Dragoon Guards), His Majesty's Body Guard of the Honourable Corps of Gentlemen-at-Arms, and of Mrs. Fergusson. He was born on 25th July, 1891, at Bellevue Park, Killiney, Co. Dublin. He was educated at Wellington College, and after serving in the ranks of both the Duke of Cornwall's Light Infantry and the 8th Hussars, he obtained his commission in the Highland Light Infantry, the Cameronians, in March, 1913. From May, 1914, to April, 1916, he served with the West African Regiment, and during that time saw seven months' active service in the Cameroons. In those early days he was already loved for the great interest he took in the native, and for his talent for organization, characteristics which he was to develop later, and which were to enable him to do so much for the natives of the Southern Sudan. All those who ever served with him will thoroughly endorse the estimate of Fergusson's character as portrayed in a farewell speech by the French Commandant after combined operations: "If we wanted more supplies, Fergusson was the one to bring them to us; if reinforcements, Fergusson; if orders or news, Fergusson; if a good friend to amuse us, Fergusson."

In June, 1916, Fergusson arrived in Egypt on being seconded for service with the Egyptian Army. He was posted to the Equatorial Battalion and given command of the Company at Tambura. During 1918 he was for three months A.D.C. to his father in Palestine, and on

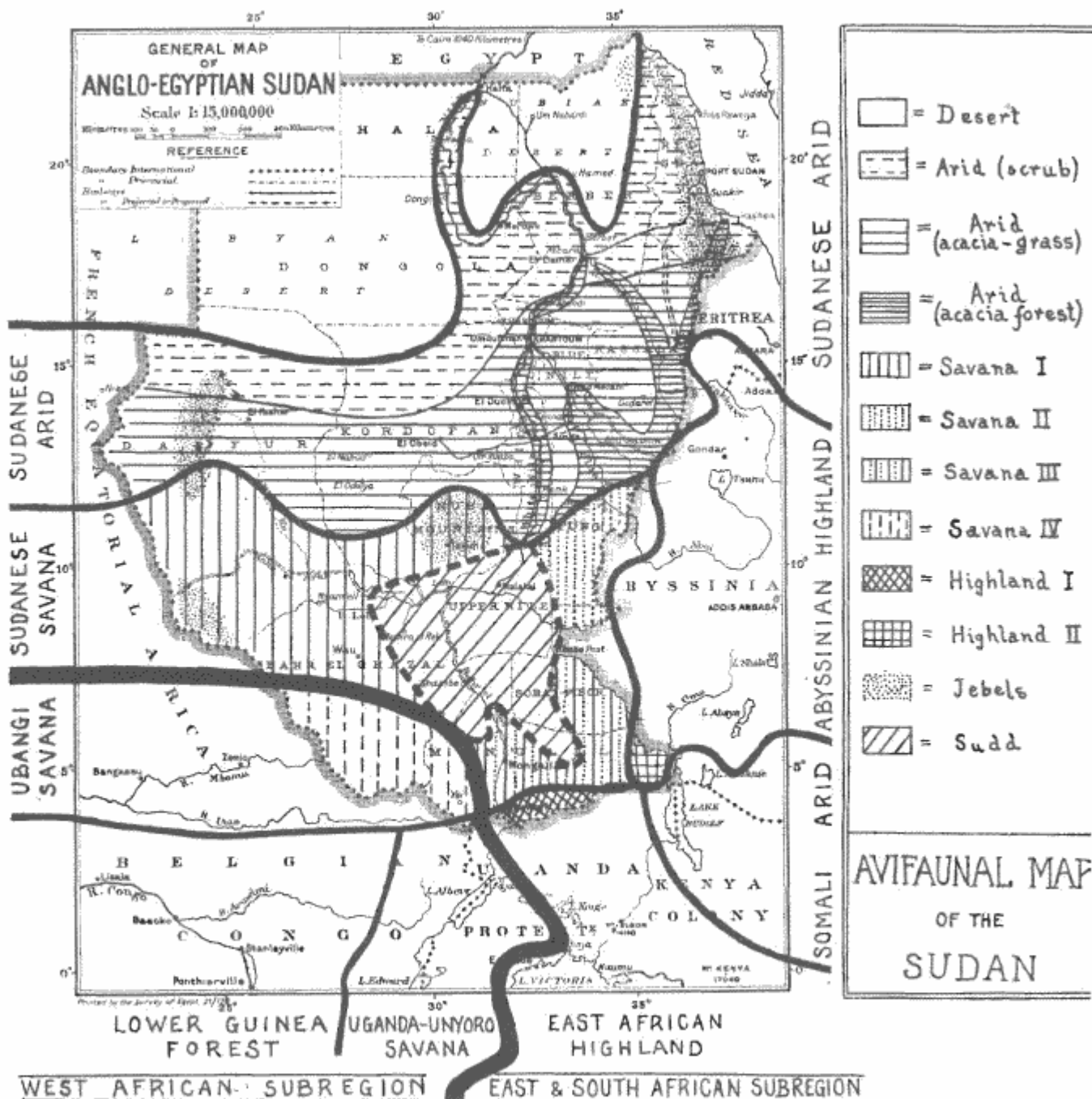
returning to the Sudan he was immediately sent on active service with a column operating against the Turkhana. During these years Fergusson had been attracted by the idea of employment by the Sudan Government as a District Commissioner, and he finally transferred to the Civil Administration in July, 1919. He was posted to Rumbek, and commenced his eight years' continuous service in the Eastern Bahr-el-Ghazal. It was during the last six years of this period that his life was devoted to bringing the Nuers of the Province under control. In this task, in the face of great personal hardship, personal danger, and many setbacks, he succeeded to such a degree that the District Commissioner of a neighbouring Nuer district described his success as a miracle. During the Aliab Patrol, 1919-20, he acted as an Intelligence Officer, and was appointed an Officer of the British Empire Order in recognition of his valuable services. It was almost entirely due to the information he obtained, owing to his knowledge of the natives, that the enemy was finally forced to surrender.

It is not possible in the space at our disposal adequately to describe Fergusson's life amongst the Nuer. He identified himself so much with that tribe that he will always be remembered especially in that connection.

As an administrator of wild tribesmen, Fergusson showed great talent, and his ability to gain their confidence and bend them to his will was most exceptional. The fact that all other sections of the tribe remained loyal and offered assistance when one section rebelled on hearing of his death is a crowning testimony to the soundness of his work. Undoubtedly, too, Fergusson, by his personal fearlessness, kindness, and ability to understand their point of view, and consequent fairness in his decisions, won the general affection, as well as the respect, of the chiefs and people.

Last, but not least, mention must be made of Fergusson's wonderful medical work. His steamer, the "Kerreri," was indeed a floating hospital, and the medical officers serving in his area bore enthusiastic testimony to the value of his work.

In Fergusson there passed away an exceptionally fine administrator, a true friend of the native, and one beloved and admired by all who served with him.



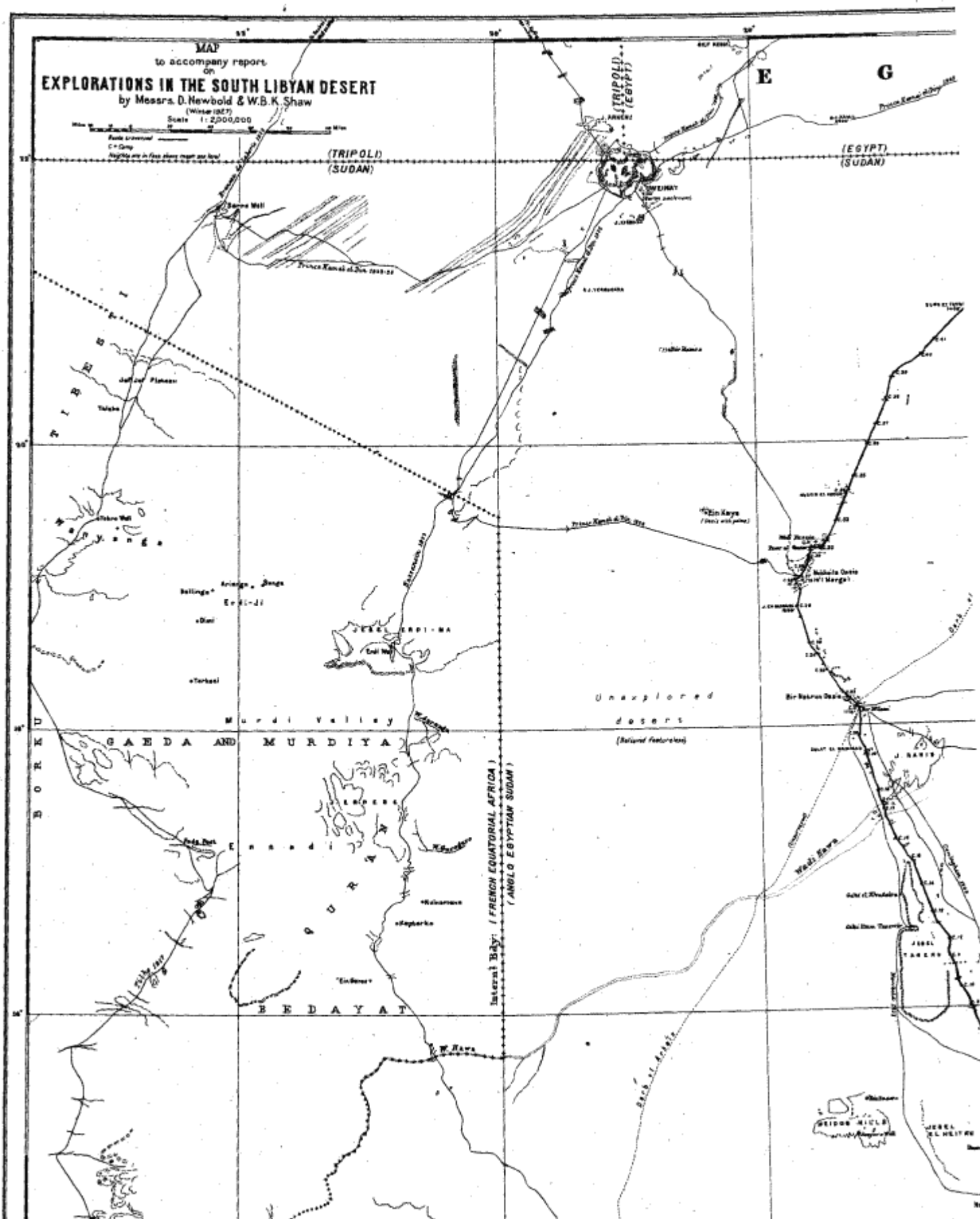
MAP
to accompany report
on
EXPLORATIONS IN THE SOUTH LIBYAN DESERT
by Messrs. D. Newbold & W.B.K. Shaw
(Winter 1927)

Scale 1:200,000

Scale 1:200,000
Route traversed
C.P. Camp
Height in feet above sea level

(TRIPOLI)
(SUDAN)

(EGYPT)
(SUDAN)



26° 15'

Sketch Map of

NUKHEILA (OR MERGA) OASIS (In the South Libyan Desert)

by

Messrs. D. Newbold & W. B. K. Shaw

(Winter 1927)

Scale: 63,360 or 1 inch to 1 mile

