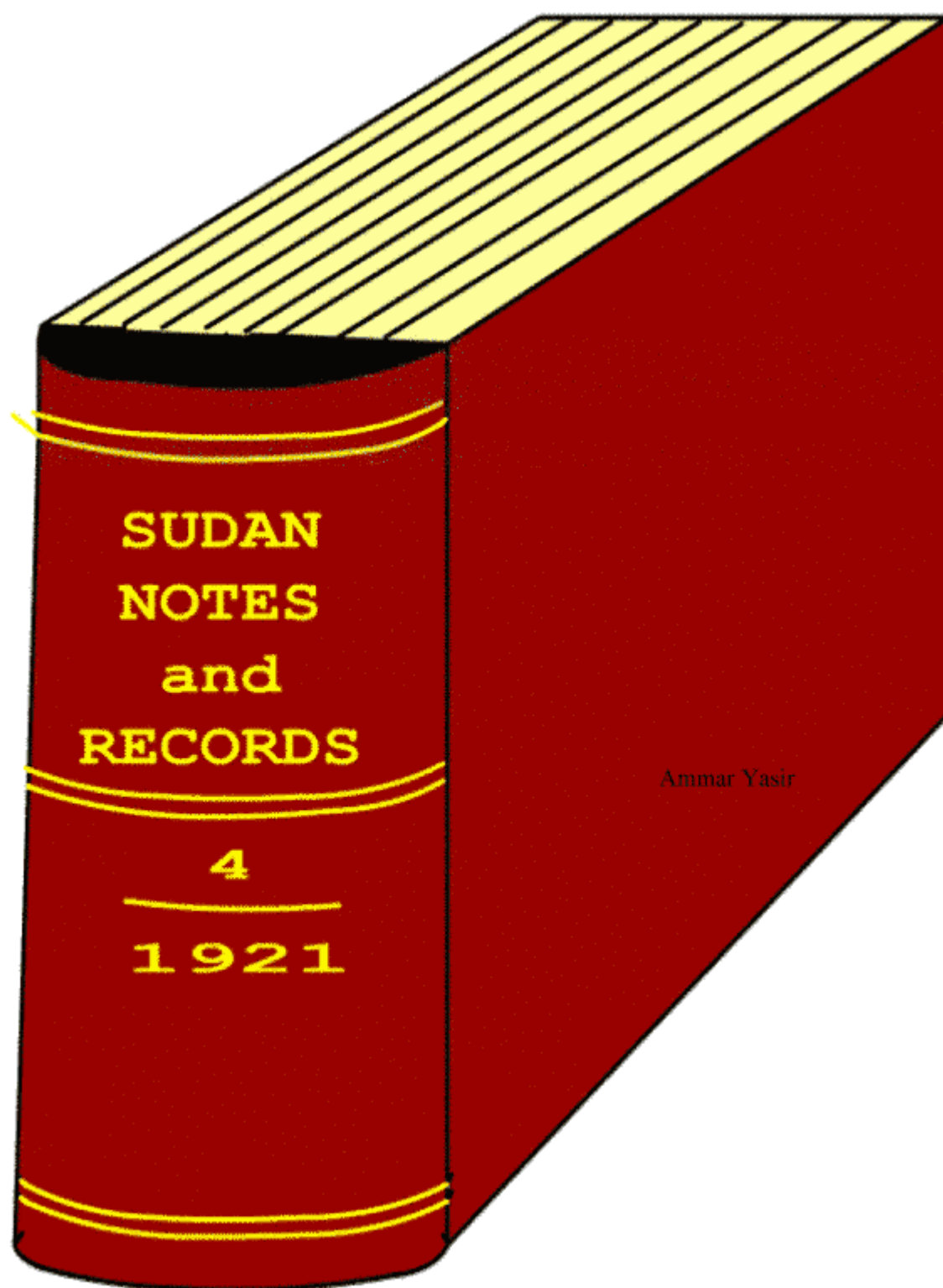




**SUDAN
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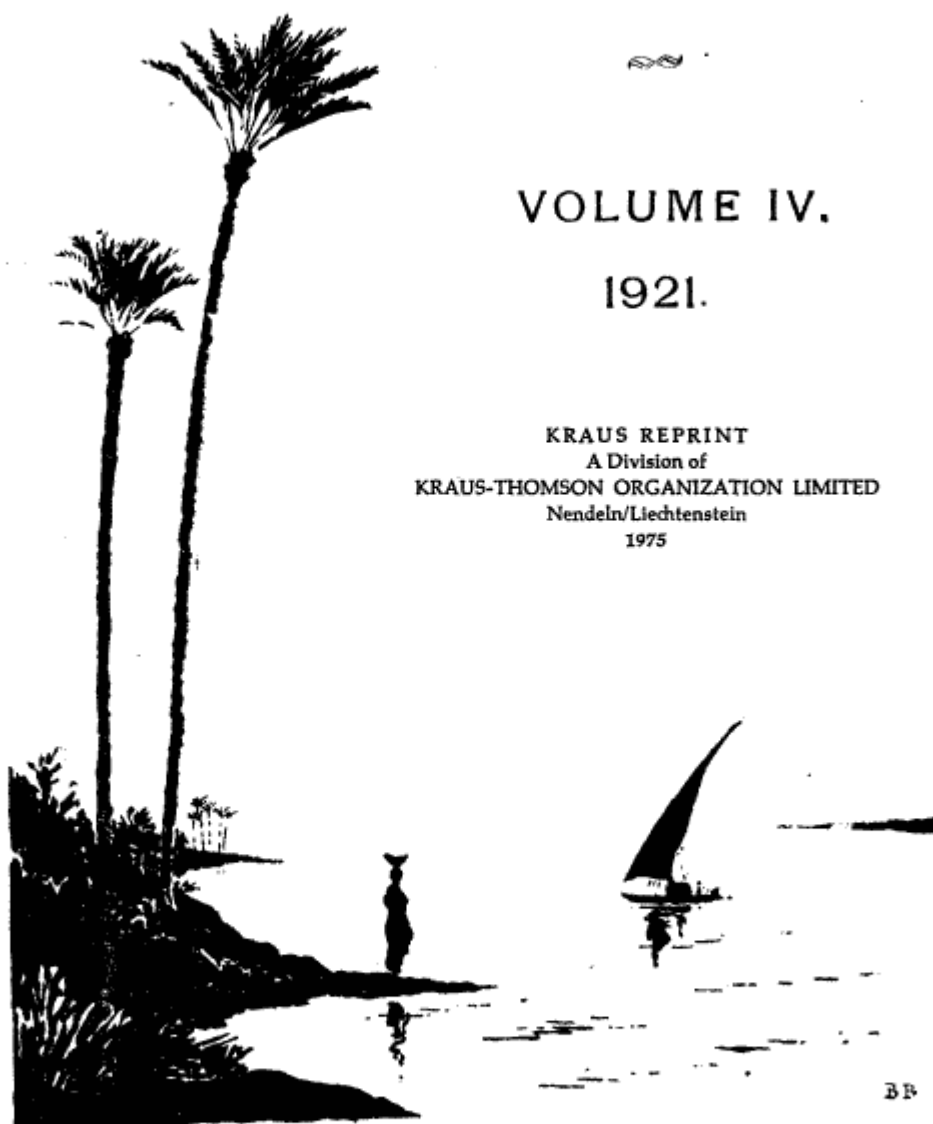
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SUDAN NOTES AND RECORDS.

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Contents

- J. .M. MATTHEW Land customs and tenure in Singa district.
- G..M. CROWFOOT Spinning and weaving in the Sudan.
- H.H. king Natural history notes
- R. B. MASSBY A note on the maintenance of quality of cotton grown in the Sudan
- H.H. KING The Spanish Sparrow in Dongola.
- B. SPENCE Investigations at Halfa quarantine.
- G.A. REISNER Historical inscriptions from Jebel Barkal.
- S. HILLELSON Arabic proverbs, sayings, riddles and popular beliefs.
- J.E.M. MELLOR Notes on four Sudan solitary wasps.
- R.N. LYNES Notes on the natural history of Jebel Marra.
- S.C. DUNN Native gold washings in the Nuba Mountains Province.
- V.H. FERGUSON the Nuong Nuer
- C.G. SELIGMAN Note on dreams
- C.A. WILLIS Religious confraternities of the Sudan.
- J.E.M. MBLOR A note on the Ruff, Machetspugnax: a bird found at Wad Medani, Sudan.
- C.B. LYALL Rights, dues and customs Prevailing among Arab tribes in the White Nile Province.
- ANON. Secret societies of the southern Sudan
- C.A.W. The manufacture of iron by the Juers
- ANON. The reason for the Beir's hatred of the Dinka.
- W.R.G. BOND Hawks and verandahs.
- ANON. A sidelight on history.
- ANON. Women and blood revenge.
- A.B. ROBINSON British consuls at Suakin
- J. WELLS Road construction across the cotton soils of the Southern Sudan.
- A.F. JOSEPH Gas poisoning in a Kordof an well.
- F.J. MARTIN AND R.B.MASSEY Experiments on wheat growing.
- C.A.W. El Teb.

C.R.K. BACON Kingship amongst the Anuak

F.J. MARTIN AND H.R.GRAY Methods of accelerating the germination of seeds.

J.P. MOSTYN Some notes on Burum customs and beliefs.

A.B.R. The Fung drum or nehas

J. POWELL Ornaments and arms among the Acholi and their neighbours.

A.F. JOSEPH Soil investigations in the Sudan.

R.O MASSEY Notes on some plant diseases caused by fungi in the Sudan.

C.G& B.SELIGMAN The Kababish.

W.A. CRABTREE The Azande.

W.A. CRABTREE The Nubian and Bari languages.

A.B. ROBINSON (W. Budge) The Egyptian Sudan.

B, SPENCE The Azande.

R. DAVIES The Kababish

E.T. COMBS A *Hausa symbol*.

D.N. Mac DIARMID The sign of the cross.

C. CHRISTY The eastward drift of sudd obstructions.

H.P. HEWINS Weights and measures.

A.E.R. The Gash dam.

D.N. Mac DIARMID Dreams.

J. W. C. Dreams.

R. COTTAM The Sudan kite, *milvus migrans* parasites.

P.F. MARTIN The Sudan in evolution.

Transliteration of the Arabic Alphabet

adopted by the Editors of "Sudan Notes and Records."

ا { at beginning of word omit, ham- za elsewhere '.	د dh (coll. d)	غ gh
ب b	ر r	ف f
ت t	ز z	ق q (coll. g)
ث th (coll. t or s)	س s	ك k
ج j	ش sh	ل l
ح h	ص ṣ	م m
خ kh	ض ḍ	ن n
د d	ط ṭ	ه h
	ظ ẓ	و w
	ع '̣	ي y

Vowels.			Diphthongs.	
fatha	a,	lengthened ā	اي — ai	(as in aisle)
kasra	i,	" ī	او — au	(as in mauser)
damma	u,	" ū		

The ʾ of the article always remains ʾ.
The silent ʾ (ʾ) is omitted.

Notes.

1. The system is not applied to well-known names, such as Khartoum, Omdurman, &c.
2. The vowel sounds of e in "get" and o in "hot" with the corresponding long vowels (a in "gate" and o in "home") which occur only in the colloquial are expressed by e, o, ē, ō.
e.g. beled, Moḥammed, bēt (or beit), ḥōsh.

Ei may be used as an alternative to ē.

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SUDAN NOTES AND RECORDS

Volume IV.

No. 1.

LAND CUSTOMS AND TENURE IN SINGA DISTRICT.

BY J. G. MATTHEW.

This paper was written in 1909 when the writer was Inspector of Singa District, and except for certain omissions, is published as written. He is well aware that during the last twelve years much additional knowledge has been acquired, but though certain statements may therefore be open to correction and criticism, he believes the facts to be accurate on the whole, and still adheres to the general principles expressed.

The system of land tenure in the Singa District is briefly a system of hereditary landlords owning large areas which they let to the cultivating classes, the small freeholder being almost non-existent.

This system would appear to be the outcome of the sovereignty of the Fung, and the majority of claims to land-ownership depend on titles derived from the Fung Sultans or Meks, as they were called. It is extremely difficult to obtain a clear account of the conditions of this sovereignty, more particularly as any one, who is capable of giving information as to the methods of the Sultans and their ways of government, from which one might deduce some ideas as to how they disposed of the territories under their sway, probably has his own axe to grind, and therefore his account will be, to say the least of it, somewhat biassed. Mek 'Adlān, for example who is the hereditary descendant of the line of Fung Sultans, and is really well-informed as to the methods adopted by his ancestors, and ready to tell one what he knows,

yet has an idea at the back of his head that he is really the king of the enormous territory once ruled over by his family.

It is possibly owing to the fact that here one is close to Sennar, the seat of the Fung government, that the idea that no title to land is really valid unless it is derived from the Sultans or at least from some one whose title was recognised by them is so prevalent, and has such weight.

Of course, while it is well known that the sphere of influence of the Fung Sultans was wide, it cannot be imagined for a moment that they really governed the country over which they held sway, and there were many semi-independent kings and chieftains whose acknowledgment of the sovereignty of the Mek can have been little more than nominal. These were either powerful members of the reigning family, i.e., Fungs themselves, or vassal chiefs of other tribes who had either never been properly conquered, or else had succeeded in making themselves formidable enough to have small kingdoms of their own.

We thus find a large number of claims to ownership based on hereditary descent from these members of the Fung reigning house, or from independent vassals: and on titles derived from one of these two classes, who apparently had a right, which is still recognized as binding, to dispose of portions of their own lands.

Other claims of course are based on rights derived from the old government: and there are a few based on rights derived from the heads of tribes, which never in any way acknowledged the supremacy of the Sultans.

But without doubt the strongest title to ownership in the minds of these people at present is one derived directly or indirectly from the Fung Sultans.

These titles are purely hereditary, and the idea of the king, chief, head-sheikh, or whatever one cares to call him, being the land-owner, while the cultivator has no claim to actual ownership, is paramount.

Claims by members of the Fung reigning house.

The members of the family of the Meks acted as viziers of the reigning Sultan, and were given portions of land for their own possession. They formed the council of the court at Sennar, and

it is said that their seals were attached to documents by which the Sultans gave territory to vassals.

The land round Singa itself belonging to Sheikh 'Omar El Khidr, and to which to the best of my belief, his title is undisputed (except by one member of his own family) was allotted to one of his ancestors by the reigning Sultan. It is not now known who was the first of his family to become owner of these lands, but it is agreed that his great-grandfather 'Adlān owned it during the reign of Mek Bādi who was Sultan when Ismail Pasha arrived at Sennar.

The head of his branch of the family owned the land, and had the right to dispose of it to whom he would without reference to the Mek at Sennar. So far he was independent, and probably the only real recognition of the Sultan was the payment of a yearly tribute. This indeed was invariable in almost all cases of these kinglets and vassals under the Sultans. In fact, as a large land-owner, who acquired his possessions shortly after the end of the Mahdia by buying from the original owners, said to me "All these people *bought* their land from the reigning Mek. Like every one else he did not give land away for nothing. It may have been an annual tribute or it may have been a lump sum—or more likely the Mek wanted another wife".

The land on the East bank opposite Singa is owned by the Mek 'Adlān. He is the direct descendant of the line of Fung Kings, and though in this way his title to land is undisputed, yet the actual piece which he now holds came to him as the result of the arrival of the forces of the Old Government. Ismail Pasha turned his grandfather Mek Bādi out of Sennar, and he was allowed to settle down on the land he now holds. This of course is a peculiar case, but as a rule the claims of the Fung are not disputed, and the extent of their properties is well-known.

Claims by vassal chiefs.

We now come to the chief of the tribes who were either not conquered completely or subsequently became very powerful. There were no doubt many of them scattered about within the limits of the Fung kingdom, but only a few of these vassals are known in this locality.

There are certainly four who are always mentioned as having received the Mangilia from the Sultans. The Mangilia seems to

have been a recognition on the part of the Sultan of the power of one of these vassal chiefs, who on his part also owed the Sultan some allegiance—probably in the form of a monetary payment. The Mangilia certainly carried with it a territory of large extent, and complete power to dispose of it in the way the Mangil wished. Probably he would produce an annual tribute to the Sultan; possibly 40 or 50 wogias of gold, or, if he were a sheikh of Nomad Arabs, many she-camels. On the occasions when he came to pay his respects and tribute, his benevolent sovereign would renew his robes sword, etc. and furnish him with a new horse for his journey back.

When a man was first appointed Mangil he was apparently invested with *ṭagla*, *ṭarbūsh*, sword and robes, with great ceremony at the court in Sennar. Then wrapping his *tōb* tightly round him he would exclaim "I am so and so, Mangil, and then was entitled to a seat on a *farwa* (sheep skin) in the council chamber.

As to the periods at which different chiefs were appointed Mangil, it is difficult to make an accurate statement. It would certainly appear that Sheikh 'Ajib of the 'Abdallab whose father 'Abdullah Jamā' was the ally of the first Fung king, was the first to be recognized as a vassal with rights over territory. We are not really concerned with him directly in this district, as, whatever his rights may have been, they do not appear to have extended so far south as this.

Another Mangil, Muḥammad Wad 'Adlan, the ancestor of Idris Wad Rajab, without doubt acquired great power during the later years of the Fung dynasty; and his family succeeded in forming a practically independent kingdom in the south. What his tribe was is not certain: some say he was a Fungāwi others a Ja'li. It certainly seems as if he may have held the position of commander-in-chief of the Sultan's army, as he appears to have had the slaves who composed it on his side, when he decided to defy the Sultan. His kingdom however was in the hills in the Roseires district and south, and I am not aware of its extent.

We now come to the chief of the Kamātir, whose territory is even now well known and stretched from Karkoj to Roseires, a distance of about a hundred miles on both banks of the river. Apparently the Kamātir were constantly fighting with the Fung, and their chief Kamtūr (this is a tribal name and recurs frequently in

the list of their sheikhs) at some time or other was invested with the Mangilla. The Kamatir afterwards seem to have suffered in the fortunes of war, and are practically non-existent now in this part of the world; with the exception of one small area owned by a man by virtue of his being of that tribe, there are no claims put forward by them.

So far as claims to land in this district are concerned the most important Mangilla is that given to the head sheikh of the Hamada, which comprises dominion over the Dinder river and the Rahad — probably only the southern portion of the latter.

This Mangilla was given to one of the heads of the Hamada probably to 'Isa or Nūr el Dīn, at a later date than those mentioned above, and it is generally said that this Mangilla was *bought*. The tribe had no doubt become very wealthy with large flocks, and the reigning Sultan saw an opportunity of replenishing his coffers. This Mangilla has remained curiously intact up to this day, and the claims of the head sheikh of the Hamada (or rather of the whole Rufa'a el Sharg comprising Hamada, Qawasma, 'Ulatiin, etc) to his dominions on the Dinder is quite universally recognised by the people.

I have heard Sheikh el-'Agab Abu Gin the present head sheikh when galloping at the head of some nomad horsemen, shouting "I am El'Agab Mangil" thus using the same formula employed by his ancestors at the Court at Sennar: and I have also frequently heard him addressed by natives on the Dinder and Rahad as Mangil, and know that it is the common way of speaking to him. I only mention this to show how deeply rooted in the minds of the people are these ideas of hereditary chiefs.

Claims by holy men.

It was the custom of the Sultans to give pieces of land to so-called holy men who would read and write and who presented themselves at the court. It is said now that no tribute was paid by them to the Sultan: it is possible that the original Fiki paid nothing to the Sultan who endowed him with the land, but I should imagine without doubt that successive rulers exacted something from his descendants. These properties to which the original owner derived his title either from the Mek at Sennar, or from one of the semi-independent kings of the reigning house, or from the vassal chiefs, are exceedingly common,

and, though the boundaries are vague, yet on the whole these properties are well-known, and the ownership recognized by all. Some of them are of considerable size with as much as five or six miles of river frontage.

The custom of giving land to holy men still exists, and Sheikh El 'Agab Abu Gin last year assigned land for a new village to Fiki Mūsa el Zeki of Dontai with whom he had no local connection.

Claims to smaller areas derived from above three classes of landowners.

The three classes of landowners described above in many cases, as time passed, disposed of portions of their property.

It was an extremely common thing for the large landowner, whether he was a Fungawi or of another tribe, to give away pieces of his land to the members of his own family, i.e., brothers, nephews etc.

For example the head Sheikh of the Rufa'a el Sharg, who was Mangil of a large territory, would assign a village and its land to each of his relations. There are a large number of old sites on the Dinder and Rahad, which were inhabited before the Mahdia, the ownership of which is well-known. The relations of the Mangil were given them from time to time and held them as their own property, and collected rent from the cultivators, though no doubt also contributing their share of the tribute which the Mangil paid to the Sultan.

The members of the Fung reigning house also did the same with their properties and the Fikis, who had acquired land, distributed portions to members of their families.

In many cases where the original properties were small it would seem to have been the custom for the head of the family to retain the rain land and assign gurūf of riverain land to the relations—the garf being a small area and about enough for one man's cultivation. There is an instance of this in the Singa lands, a member of 'Omar el Khidr's family having inherited two gurūf of riverain land, his grandfather having been the younger brother of the head of the house.

There are also cases in which the landowner disposed of portions of his property to strangers who settled in his country. The heirs of one 'Abdallah el Hasan, a Kināni, who had come to this part

of the world a long time ago, owns portions of the Singa lands, which he ('Abdallah) acquired from the grandfather of 'Omar el Khidr, the present Fung landlord.

On the Rahad we find a large tract of country some thirty or forty miles of river, which was originally within the dominion of the Mangil of the Dinder and the Rahad, now in the possession of the Kawähla tribe as represented by their head sheikh. The Mangil had obviously in this case disposed of a portion of his territory in precisely the same manner as the Fung Sultan and given it to him in the first instance. The Kawähla were no doubt a wealthy and possibly troublesome tribe, and this was evidently an easy way out of the difficulty caused by inability to control them. In this Kawähla country again there are villages (for the most part only sites now) well-known as the property of the relations of the head sheikh.

In fact, to emphasize this point again, it may be stated as an almost universal rule that, where tracts of country of any size are claimed by *one man*, we find within these areas village lands with more or less well-known boundaries belonging to the members of his family. Of course at present many of these villages are only represented by sites, which are gradually being reopened.

But it is important to note that the land which has never been cultivated (i.e., on which there has been no village) within these large tracts is recognised locally as the property of the head sheikh,

The re-making of old villages opens an enormous field for disputes, as the process of defining boundaries of lands, which have not been cultivated for possibly thirty years, is a difficult one in a country where in that period the growth of forests almost entirely obliterates all marks.

Claims based on titles given by the Old Government.

These are of fairly common occurrence but one hears less about them in the general way as in the minds of the people they have little weight compared to a claim based on a title derived from el Saṭāna El Zargā (the Fung were called the "Black Sultans" from their swarthy complexion). The attitude of the Fung and Rufā'a and other Arabs, who have dwelt here for centuries, towards landowners, whose title only date back to the Old Government, is

fairly represented as follows "Oh yes, they own land : they haven't a title from the Sultans, but the Government wanted to open up the country, and get *rabta* (i. e., the tax paid by every cultivator) from the tillers of the soil, and so they gave them a piece of the *Kamātīr* or the *Rufā'a* land. It is just the same as the *Kināna*, who don't belong to this country, and to whom you have given a large tract in the middle of our dominion."

Many *Ja'liyin* acquired titles in this way, more especially on the west bank near *Abu Na'āma*. The headquarters of the *Kamātīr* was at *Barankwa* (close to *Abu Na'āma*), and by the time *Ismail Pasha* arrived they were a decaying tribe as the result of perpetual conflict with the *Fung*, and so their country was almost deserted, and in consequence strangers were "dumped" in it by the Government. The common phrase is that these titles were acquired by *rabta* (i.e., payment of the same) or by "*amarta sākit*" i.e. "simply colonization". They do not realise that a title of this sort, supported by evidence of continuous receipt of rents from cultivators, is in our eyes more valid than any amount of so-called deeds of gift from bygone kings.

In some cases e.g. *Hillet Dentai* near *Karkoj*, the village lands were divided up among individuals to a certain extent, especially the riverain land : and a few cultivators in this village hold a *wathīqa* (1) for small plots, which have been in their families for some generations. Some of these seem to have come from the *Hameg* who at one period of the Sultanate were all-powerful; while others were given them by the Old Government — possibly the work of some energetic official who thought that the cultivators were an oppressed class. But such division of lands among individuals is the exception not the rule.

Claims by nomads.

This class of claim is the most difficult to deal with, more especially as originally many of the Arabs were nomads, and it was only gradually that a certain number of them settled down in villages and became sedentary.

There are however cases of nomads claiming rights over large tracts of country, though one would imagine that these are no more

(1) *Title-deed.*

than grazing rights. Nevertheless they bring forward claims with some justice to certain sites where they used to have villages and *some* cultivation.

The Rufā'a El-Hoi for example who claim a very large area on the west bank of the Nile, including most of the rain land from Singa to Roseires (their head sheikh being Yusif Abu Rōf) always affirm that they never recognized the Fung supremacy. The Fung say that they lived "away at the back there" and were not land-owners, but simply wandered over the vast plains of grass land between the two Niles with settlements at places like Gebels Mazmūm, Bozi, etc. There is no doubt that they were an extremely powerful tribe; and in the time of the Old Government the head sheikh would come to pay his tribute with an enormous retinue and thousands of camels.

It is stated by some that they were granted ownership of their domains by Selim Pasha, but the general opinion is that they were allotted this portion of territory simply for grazing, and that it was a purely administrative act.

It is strenuously denied by the local Fung authorities that "The Abu Rōf", as a Scotchman might call him, was ever given the Mangilia. He possibly did not require it.

The 'Agaliyin on the east bank some way south of Singa were also nomads, though now almost entirely sedentary. Their existence was recognized by the Kamātir, but probably only as having grazing rights over certain areas, though during the Old Government the sedentary portion of them certainly lived in villages of which the sites are still well-known, and indeed have been re-formed in large numbers.

In some ways there is not a great deal of difference between the claim of Yusif Abu Rōf and his tribe and that of Sheikh El 'Agab Abu Gin, as very many of the Ḥamada under the latter were and are still nomads. But there was among the Ḥamada and their allied tribes a far larger sedentary population, and a centre of so-called government at Deberki on the Dinder, where the Mangil had his abode, and where there are still to be seen the tombs of the Ḥamada head sheikhs, Mūsa Abu Gin, Ṭaha Wad Muḥammad, and others.

As a matter of fact in the case of Yusif Abu Rōf his claim is disputed by the Aulād Malik on the following grounds. A few generations

back Wad Malik was the head sheikh of the gabila Abu Rōf. At the beginning of the Mahdia apparently the gabila split up, Muḥammad Wad Malik refusing to have anything to do with the Derwish rule. Marḍi Abu Rōf however with a large section of the tribe made a timely submission to the Derwishes, and was recognized by them as Head Sheikh. He apparently soon got tired of Derwish methods and rejoined Muḥammad Wad Malik and the rest of the tribe near Gebels Mazmūm and Gule, and to a certain extent defied authority. He thus managed to retain the position of Head Sheikh, which his son Yusif Abu Rōf inherited from him.

In dealing with almost all those claims incidents of this sort are bound to crop up, but the fact remains that, as in Yusif Abu Rōf's case, only one man is recognized as Head Sheikh by the tribe as a whole, whether he acquired his title justly or not.

Other claims.

A certain number of claims are put forward based on purchase of land during the first few years after the Mahdja, before it was ordained that Government approval should be obtained for land transactions. Owing to the recent date of these there is not, as a rule, any great difficulty in dealing with them.

Claims to land as acquired during the Mahdia are not seriously put forward. There are certain number of people, who shortly after the Mahdia presented petitions, and were allowed to form villages, which they stated they had inherited originally. Sometimes these statements appear to have been obviously untrue, but it is generally recognized that, as they were clever enough to get in early, they have substantiated their titles. An example of this sort is Muḥammad el Mek Nāṣir, who owns land within the limits of 'Adlān's domain, which the latter's grandfather acquired when he was removed from Sennar by Ismail Pasha.

These seven classes of claims to land are roughly those that a Settlement Officer might expect to encounter. I have not attempted to maintain any very rigid distinction between these classes, and they are more or less arbitrary divisions for the sake of clearness in description. Nor am I prepared to admit that this is in any way a complete or comprehensive list of sorts of claims. There is for instance one solitary case of an 'Anag (or so-called 'Anag—his

claim to be one, though acknowledged, is always done as with a laugh) Hasan Wad el-Magbūl at Kiran, whose title would rest on the fact that his ancestors resided on this spot before the Fung dynasty. But no doubt this title was recognized by the Fung Sultans, and therefore he should come under the fourth class.

Other isolated instances of unusual claims of this sort may and will crop up, but I maintain that the classes I have mentioned contain the most important and most general.

PROOFS OF CLAIMS TO OWNERSHIP.

Continuous receipt of rent or profits.

With the exception of the period of the Mahdia, when receipt of rents was interrupted owing to *force majeure*, the average land-owner would have little difficulty in proving that his receipt of rents or profits was continuous. I am speaking now of sites under cultivation at the present moment.

Before and during the Old Government the following rents accrued to the landlord :—

(1) 'Ushūr.

He was entitled to one tenth of the dura crop of his tenants. This 'ushūr was paid in kind.

(2) Gadaḥ.

Every tenant who cultivated simsim had to pay the landlord four rub'as of an ardeb (some say *two* rub'as) annually. This fixed rent, gadaḥ, was taken for the land which a man had under simsim irrespective of its area.

(3) Dagāga.

There was an annual house-tax called "dagāga", which consisted of one riāl (10 P.T.) per annum for each hut, paid by the owner to the landlord. This was collected before the rains.

The above three forms of rent were the principal ones in vogue during the Fung supremacy and the Old Government. There were no doubt variations of them — in fact the dagāga does not seem to have been universal, being more especially confined to the Dinder and Rahad. Also a hard landlord might insist on taking 'ushūr on the simsim instead of the gadaḥ.

In addition to these

(1) On riverain land the owner would take two or three tobs of dammūr as tent according to the size of the garf.

(2) On šellūka land the owner would provide seeds, and when the crop ripened he was entitled to a third or perhaps a half of the produce according to previous agreement.

There were also other payments or profits to which the landlord was entitled.

(1) Dūgundi.

This was a sum paid to the landlord by a new tenant if he were allotted a plot of land which had been "improved" by a former tenant. This improvement consisted in the clearance of trees from the land and the amount of dugundi was fixed by agreement between prospective tenant and landlord.

(2) Daḥwa.

Another custom also existed, called "daḥwa", whereby every able-bodied man in a new village created on a certain property would repair to the rainland and work for half a day in clearing land and sowing a crop for his landlord's benefit (of course in those days an able-bodied man as far as cultivation was concerned meant a slave, the Arabs were not reckoned). If they were too busy building their own houses or clearing their own land, they would pay one or two piastres per head in lieu of their work. This only took place *once*, and that at the time of the creation of the village. After this the people were supposed to have paid their footing, and only continued to pay ordinary rents as described above.

Present system of rents.

During the first few years after the Mahdia landowners may have exacted the same rents and payments as they had been accustomed to do before, but villages were so few and landlords so anxious to start their old villages again that they remitted rent in many cases, and there was no regular system.

"Khums".

In 1902 a Province Order (No. 100) was published of which this is the substance — "All concerned are to be notified that the legal

ground rent has been fixed at a sum equal to one fifth of the amount assessed by Government for the 'ushūr and that owners are on no account allowed to charge more....."

This was modified in 1905 (No. 345) as follows:—

"The cultivator does not pay the fifth to the land-owner for the first two years if the land has been cleared by him".

At the end of 1906 (No. 996) the recognition by Government of the payment of the khums was abolished, unless a written agreement between landlord and tenant could be produced. Cases, where, though no written agreement existed, yet payment of rent for a considerable time (two years or more) could be proved, were to be dealt with on the assumption that the tenant had agreed to this arrangement.

It is not clear how this system of the khums (i.e. rent at the rate of one fifth of the 'ushūr assessment) came into being, but nowadays all land-owners are aware that this rent has been recognized by the authorities, and when new villages are made an agreement is invariably drawn up with the tenants (or rather with the sheikh) that this rent shall be paid.

In certain cases a man who owns land to which his claim is not disputed, proceeds to collect some of his tribe and makes a village on his own property, himself becoming sheikh. He then takes the khums from all cultivators with possibly the exception of his own near relations, who would thereby acquire freehold. This freehold on the part of the relations is, I believe, generally recognized by landowners.

In the majority of cases however a landowner with a large property looks about for a suitable man to bring people to settle on his land. The usual arrangement in these cases is an agreement between the landlord and the sheikh, whereby the latter collects the khums, and gives half of it to the landlord and retains half himself. The sheikh is in fact the land or estate agent, and by his means the cultivation of the land is assured, and consequently the landlord's rent roll increased. The landlord does not deal directly with cultivators (except when, as mentioned above, landlord and sheikh are one), and all arrangements as to allotment of land to cultivators are made by the sheikh. In fact as far as the cultivator is concerned the sheikh is his landlord.

In accordance with the Province Order of 1902 a tenant may not be turned out of his holding without a year's notice, but as a matter of general custom he cannot be turned out as long as he pays his khums.

When a man wishes to move from a village he leaves his cleared patch and also his hut at the disposal of the sheikh as representing the landlord. In this connection one finds that dugundi is still taken. The new comer to a village already established pays his two or three riāls for a cleared patch, if he does not wish to open new land, and if there is a cleared piece available.

This system of khums, to the best of my belief, works well. It is usually collected without much difficulty, as one might expect, the tenants being a class of people accustomed for generations to paying rent, until quite recently a very heavy one. 'Ushūr, gadaḥ, dagāga, to say nothing of dugundi and ḍaḥwa, all paid to the landowner, in addition to the ṭulba exacted by the Government made up a very different total to that paid nowadays.

As stated before, dugundi *does* exist in places, and I do not consider it a hardship. The ḍaḥwa, I believe to be extinct, though it existed within the last few years and even now the sheikh and landowner may get the people of his own village to clear him a patch for cultivation — but only as a favour.

Of course land-owners complain bitterly of the smallness of the khums, and say that so many are exempt, either relations or paupers, that is barely worth collecting. Nevertheless it *is* collected, and is better than nothing.

It appears then that continuous receipt of rent or profits (i.e. receipt before and after the Mahdia) could be proved in many instances. There are others where five years continuous receipt of rent up to date could be brought forward to support a title: and indeed the khums itself has been in existence for longer than that.

**Former possession based on receipt of rents or profits
terminated by force majeure during the Mahdia.**

There is a very large class of claims which might be made valid on this ground. On the Dinder and Rahad especially, where before the Mahdia there are supposed to have been as many as 500 villages (whereas now there are about a hundred) there are an enormous number

of sites which were under cultivation, and from which the owners, either Sheikh el-'Agab Abu Gin or his relations (the latter deriving their titles from him or his ancestors), received rents or profits as described in the previous section.

As to the tracts of land, which in those days were uncultivated, though of small extent when compared with those tracts now, I think it may be fairly said that the Head Sheikh was "in possession".

These remarks do not apply to the Dinder alone, but it is the most notable example, because, of the countless villages, only three, Lueisa, Abu Hashim, and Bueida, succeeded in weathering the storm, and in preserving their existence throughout the Mahdia.

**Proofs, which in the eyes of natives are binding,
that possession existed in former times.**

These rest on (a) documentary (b) oral evidence.

I only mention them because they still have great weight with the people, but as to how far they are compatible with the provisions of the "Title of Lands Ordinance" I cannot say, owing to the fact that proof as to possession and date of its termination is difficult to obtain.

(a) Documentary evidence.

As far as the Fung Sultanate is concerned one can dismiss documents almost as quickly as Lord Dufferin did "snakes in Iceland". *There are none.* This is not literally true; but I have only succeeded in unearthing *two* mouldy deeds of gift from the Sultans.

One Abd el-Hamid of Gezair near Karkoj possesses an imposing document granting the Gezair lands to his ancestor Fiki Idris Wad Muhammad Wad Mekki el-'Abbasi, sealed with the seals of Mek Ranfai, Sultan of Sultans, at Sennar on the 20th of Sha'ban 1220.

Faql Wad el-Faql of Keneiza also treasures a still older and dirtier deed from Mek Ismail Wad Badi, who flourished probably about 1100 A.H. This potentate, when giving the land to el-Hag 'Omar Wad el-Hag, inserted this wise provision — "and no one shall lay hands on this property while I am alive".

Whether these documents are genuine or not would require an expert to discover.

While on the subject of documents I should like to draw attention to the history of the Fung Kings, now in the possession of Mek

'Adlān, which was translated by the late Mr. Marsden (1). It unfortunately gives no record of methods of government etc., but is a most interesting account of the perpetual wars undertaken by the Fung dynasty, and of their haps and mishaps; and gives one a good idea of the vast regions over which they exercised influence, if not dominion.

Documents from the Old Government are more common, though even these are few and far between, while there are also a few decisions given by a sort of land commission at the Khalifa's court as the result of complaints made to him about ownership.

It is not however to be wondered at that deeds are so scarce. The oft repeated story "the fire devoured it" which is the invariable excuse when some paper is required, has a good deal of truth in it. People who dwell in straw huts in the midst of villages portions of which are burnt almost annually, cannot retain documents for long.

(b) Oral evidence.

This I imagine is of much the same class as in the other parts of the country. Possibly the presence of the Fung, and indeed of the direct descendant of the Sultans, makes it of more value than in some places. Certainly Mek 'Adlān is a mine of information, and no land case is settled without his opinion being taken; and it is highly valued by natives themselves. There are several grey-beard sheikhs, notably Abu el-Ḥasan of Abdin, whose evidence also is most valuable. The fact also of the cohesion of a tribe like the Rufa'a el-Sharg under a Head Sheikh makes it easier to get definite information than in places where tribes are scattered, and tribal life does not mean so much. In fact I should say that at present the opportunities for acquiring evidence of this sort are very good.

SYSTEM OF INHERITANCE.

In dealing with claims to land one has to remember that in the days of the Fung Sultanate, and in fact to some extent even now, side by side with the laws of inheritance as provided by the Mohammedan Law there is the system of the tribal chief chosen by members of his tribe. This frequently complicates the question to no small extent.

(1) *This document forms the basis of Mr. H. C. Jackson's 'Tooth of fire'. (Oxford 1912)*

In the ordinary course of events the chief would be succeeded by his eldest son, but this does not follow as a matter of course. The son might be a man not respected by the tribe, or a fool, or in some way quite unsuitable to succeed his father. In this case a meeting of the tribe was held and another was appointed. If possible, he was also of the deceased Head Sheikh's family probably younger son, brother or nephew. The successor then held all rights of ownership possessed by his father. Then there is also the possibility that the eldest son, though he may not be unsuitable, yet at the time of his father's death is too young to succeed him. In such a case an uncle would act as regent for him, and no doubt would sometimes succeed in making his position so strong that he would never be turned out of it. Sheikh El-'Agab Abu Gin is a case in point. His elder brother Beshir left a young son Muhammad, who in the ordinary course of events would have succeeded his father as Mangil. El-'Agab Abu Gin had always assisted Beshir in his work, and was a remarkably shrewd man into the bargain. He succeeded his brother probably only temporarily, proceeded to instal himself permanently, and soon was generally recognised as Mangil by all.

In the case of land-owners who have acquired their titles recently by purchase, and where no tribal question is involved, property descends from father to eldest son in the ordinary way with shares for other sons and daughters.

During the Fung Sultanate, as far as one can make out, women had no rights to property in land. It is difficult to determine when they first began to acquire such rights: probably with the advent of the Old Government, and the consequent accessibility of the *Mehkemeh Shar'ia*.

Slaves had no right to land, but the son of a slave woman by an Arab father was on an equal footing with other sons. Indeed several Head-Sheikhs e. g. Yusif Abu Rof and El Medani Ahmed are the children of slave women.

APPENDIX.

Kinds of land, definitions etc.

Natives divide land roughly into rainland and riverain land, but one has to remember that a good deal of what they call riverain land depends for cultivation on rain-fall. I however take the two classes as distinguished by the people.

(a) Riverain-land.

This is called *bahri*, and consists of islands, sand-banks, *sellūka*, and a piece stretching inland some way from the river to the edge of the forest, or the edge of the cotton-soil.

(1) "*Jazā'ir*" (Islands) consist of all portions of land which at High Nile are cut off by water from the bank.

(2) "*Rimāl*" (=sand-banks) is the sand as far as the bottom of the sloping bank.

(3) "*Barrāya*" is the sloping bank from the edge of the sand up to the top. (The top edge, i. e. the actual edge of the bank, is called "*geif*"). This *barrāya* includes what is officially termed "*sellūka*", which is not a native term here.

(4) "*Gereir*" is the flat land from the *geif* back to the edge of the forest or cotton soil. It includes what is generally known as *garf maṭari* or *garf ḥai* according as to whether it is cultivated by rain or irrigated.

Till the advent of this Government there were no *sagias*, and all *gereir* was known as *garf maṭari*.

Now there are a few, and some *shadufs*, and it is the *gereir* which is the irrigable land.

The word *garf* is a difficult one to understand as used locally. The general opinion is that it has always been employed here to signify a "patch of cultivation" (the *gereir*); but it is also applied to a patch of *simsim* on the rain-land (never of *dura*).

"*Maṭara*" (well-land) is not an indigenous term, as there are only two or three wells for purposes of irrigating crops, and those only made in the last few years.

(b) Rain-Land.

This is called *ḡahra* (or *maṭari* land), and the term is generally applied to all land down to the edge of the *gereir* (i. e. the flat land stretching back from the river).

"*ḡahra*" land consists roughly of two kinds :—

(1) "*Azāza*". This is hard and red sandy soil, and not suitable for crops except *dukhn*, it always keeps dry and is usually chosen for the site of a village.

(2) "*Bādōba*" is the cracked "cotton soil". When this is fresh and absorbs rain quickly it is called *fūdah*, when it is "tired" and

water stands in it, it is called *um gimeida*. In the latter case crops grow quickly, but the yield is small.

There is a particular kind of land which, I believe, is rather peculiar to this part of the country – that is the “*māya*” or “*farash*”. I do not know whether it should be called rain or river land. The *māya* is a low-lying piece of ground, quite close to the river as a rule (usually surrounded by dense forest – probably *sunt*) into which the Nile “spills” when very high, and which in any case collects a lake of rain water. These *māyas* are cultivated in the same way as *sellūka* land i.e. as the water gradually dries up in the winter. In some however shallow wells are made, and crops of onions etc, are irrigated from them by *shadufs*, or “*nebaru*” as the *shaduf* is often called here.

Other definitions.

“*Ghafār*” (or *būr* – rarer) = land *not* cultivated, probably through lack of people to clear it.

“*Hadab*” = a high stony bank over the river not suitable for rain crop, or for *sagia* or for *shaduf*.

“*Hadam*” = bank, which the river eats away every year, owing to its crumbling nature, which would otherwise be irrigable: but it is impossible to erect a *sagia*.

“*Karad*” = stony land with some mud on it uncovered at Low Nile, on which bushes etc., grow.

“*Haram*” = the space round a piece of cultivation or rain-land. There is an interesting custom with regard to this. If two village cultivators have patches a little distance away from each other, and each wants to cultivate the intervening space, they will agree that one of them shall “throw the axe” to settle the boundaries of this *haram*. He then throws an axe between his legs back-wards, standing on the edge of his own plot, and where it falls is the extent of his *haram*, i.e. gives the amount of the intervening space he is entitled to.

Haram in the meaning of a cleared space round a village, between it and the cultivation, has only come into existence since the arrival of this Government. Before, crops were sown right up to the houses.

Nagada = the cultivation near the village.

• *Maghōra* = tiny patches sown by the women in the middle of the houses.

Bilad = patch of *qura* cultivation as opposed to a garf of *simsim*.

SPINNING AND WEAVING IN THE SUDAN.

BY GRACE M. CROWFOOT.

This age-old craft has long been practised in the Sudan. Fragments of fine linen found by Dr. Reisner at Kerma have been dated at about 2000 B.C. and he thinks that they were certainly woven in the country, though possibly by some Egyptian workmen attached to the household of one of the great noblemen then administering the country.

Some 2000 years later, throughout the Meroitic period we see, carved on temple and pyramid, people dressed in figured robes whose lavishness and variety suggest a native and highly developed craft. Nothing is to be seen of such work to-day, both spinning and weaving are now practised only in very simple ways. Nor is the weaver's occupation held to be very honourable — but then, no work is. A verse quoted here says:

There is no compassion in barbers

Nor virtue in weavers

Nor generosity in butchers

فلاحين حياهم ولا حاك فاضل
ولا كان جزاكرهم الخصال

Only four occupations are considered respectable, that of the priest ('alim) the clerk, the merchant and the officer. The rest descend in a growing scale of meanness until, as in Ancient Egypt, the utter contemptibility of the fisherman is reached.

As far as the treadle loom is concerned, weaving is a man's craft. A woman may weave a shamla, but it would be a disgrace for a man to weave one, and she may go so far as to lay a warp for a piece of cotton but it would be shameful for her to weave it.

I can give no rational explanation of these customs and I do not expect to be given one by those who practise them. The Sudanese woman who tells you firmly "I keep a custom because it is a custom" is much nearer the truth than one who gives you a reason invented yesterday to account for a custom which has its roots in a long forgotten past.

Women weave in many parts of the world and there is no valid

reason why they should not, except that it is tiring, and that applies to it more as a trade than as a home craft.

Spinning on the other hand, is considered womanish in these parts, although some men can and do spin and as near as Darfur it is a recognised man's craft.

Spinning.

There is a charming verse sung at the Arba'in El Wilāda in which spinning is praised.⁽¹⁾

A blessing on you who came a daughter to your mother
 Let anyone who is not pleased with you, groan by himself.
 You will spin yarn for cloth
 And quit your Father of his taxes.

Baraka el jeiti li ummik bitt
 El mā bik el yagnit
 Tighzili el rubṭa ⁽²⁾ lil tibān
 Teḥilli abūki min el diwān.

The daughter still spins to pay her father's taxes, although she cannot pay them in kind as in the days when dammur was legal currency, and although the import of cheap cotton goods from Europe has lessened the demand for home-made fabrics, the women are still expert spinners.

The materials used, until the introduction of longstapled cotton under the present Government, were probably of very short staple, such as the varieties of cotton known as belwa, abu hareira, ghelesa (Kordofan) etc, and the wool from goats, sheep and camels which grow sparse coats suited to a hot climate, and this character must be kept in mind in studying the Sudanese methods of spinning, knowing how intimately the tool and its handling are linked with the material in use.

The forms of spindle commonly seen are shown in Fig. 1. to 4. Fig. 1 and 2 represent the cotton spindle, a slip of wood (the pillar) with a notch at the top and a circular disk (the whorl) made of gourd rind or composition stiffened with gum. Fig 4 is made of wood throughout with a square whorl and no notch on the pillar,

(1) *Sudan Notes Vol. II. No. 3*

(2) *Rubṭa = 20 pairs of warp threads tied together.*

and is used for wool. Fig. 3 is a fine cotton spindle bought from a Berti weaver, near Sherkeila (Kordofan). It is made of wood, both whorl and pillar, and has a very ingenious notch in its rounded top.

Cotton is usually prepared for spinning by hand, the spinners say that it is very difficult to obtain a fine thread from machine ginned cotton, and, though they do not object to the use of the native bamboo handgin when speed is desired, they prefer to spin straight from the seed, freshly gathered, just stripping off the lint and forming it into a light roll between the palms of the hands.

I think this preference is sound — it is certainly easier to spin from a roll of cotton where all the fibres are lying in their natural order unbroken, than from one where the fibres have undergone tearing and matting under the teeth of the gin and have only been partially reassembled by carding.

Further, the argument used by advocates of homespun in England, that the material is more durable when the thread used is spun from the fleece, with the wool fibres unbroken and in their natural lie, must also, I think, apply to the best quality "dammur" when woven from thread spun from the seed.

The operation of spinning may be thus described:— the spindle is held in the right hand and a roll of prepared cotton in the left. It is possible to start a thread straight from the roll, but the easiest way is to spin on to an old thread tied to the spindle. The thread once started is hitched round the top of the pillar and the spindle is twirled with the right hand while the lint is eased out by the fingers of the left hand, in a thin shred, sometimes to a yard's length. The spindle is variously twirled, but always whorl uppermost, sometimes on or in the hand, where it is rotated by delicate motions of not only the fingers but the whole hand, sometimes by being given a sharp twirl between the fingers or against the thigh and allowed to drop and twist up the thread, or rest while the cotton is being thinned out, at the pleasure of the spinner. When the length of cotton paid out by the left hand is spun up, it is wound round the spindle below the whorl thus forming one of the little white cones of thread which are to be seen in the market at Omdurman and other towns. The distaff seems unknown, except occasionally in its most primitive form, a plain stick round which the cotton is lapped.

There are several qualities of thread produced here due to differences of spinning and quality of cotton, but, as one might imagine, they are not highly standardized. The best known distinction is between warp and woof thread for the two qualities of dammur used respectively by men and women. The warp thread for women's dammur should be hardspun, very fine and strong and only the most dexterous spinners can make it, it fetches a good price and is rarely seen in the market, as the producer has usually as many orders as she cares to take. The warp thread for men's dammur should be also hardspun and fine, it is slightly thicker and stronger than that used for women's dammur. The woof thread in both cases is thicker than the warp thread, soft and lightly spun, it requires no great skill to produce, and is much cheaper than warp thread, though here again, the worker who can produce a superior woof thread, very soft and very even, can always command her price.

The resulting material in its better qualities is strong, soft and durable, and has had a ready sale in the country at any rate since Burckhardt noticed the sale of dammur at Shendi nearly a hundred years ago and probably long before that. If it has a fault I should say the texture might be more pleasing, if the warp and woof were more equal in thickness, but this is a matter of taste.

To turn to wool — the spinners are quite as expert as the cotton spinners, but they are few and far between, only found in those wandering families who weave tent cloth, camel girths etc. from the wool of their own flocks. They call themselves Arabs, but belong to many different tribes and I am inclined to think that the only ground for their claim to more Arab blood than their neighbours in the town is the fact that they have not settled down yet. For this reason, too, it is difficult to study their crafts, one has to seize the opportunity and make friends with a shamla weaver quickly, before she vanishes into far wadis.

There are a few families (Kawahla and Kababish) who spend part of their time on the outskirts of Omdurman, and my information is obtained from them, from a woman of the Mesellamia at Aghebab (near Rufaa, Blue Nile Province) and a woman of the Hamar (Kordofan) who was for a short time in Khartoum.

Wool is usually *not* prepared for spinning, except by tearing and beating, washing and dyeing are both considered to spoil the wool for this purpose. The only woman I have met so far who knows

how to prepare it successfully is one who lived for a time at Darau (Upper Egypt). Her method is excellent.—she washes the wool in river water without any soap, dries it on a bed of clean sand in the sun, tearing it all the time, and then rolls it lightly in her hands. The result is a perfect "rolag" (Scoticé) for spinning the wool is clean but with the natural grease still in it, and the quick drying has prevented any shrinking or felting.

The method of spinning is masterly in its control of the short stapled wool usually available ⁽¹⁾. The women whom I have seen in Omdurman twist the wool round the pillar of the spindle with a half hitch to hold it while spinning, as is done in Scotland, but for the rest, their method is different. The Scotch spinner drops her spindle whorl downwards, gets a good twist on, rests it, thins out the wool between the fingers of the right and left hand, lets the twist run up to the left hand, winds up and repeats. The Sudanese spinner twirls the spindle whorl uppermost, on her right hand, while with the left she controls the growing thread, flicking up the short tufts of wool towards it from a heap on the ground, sometimes weighted with a stone, probably to keep it from blowing away.

The Hamar spinner has a different method from the other women I have seen; her spindle is a plain stick, without whorl or notch, it is twirled in the right hand and the half hitch is made round the lower end of the stick.

I asked one of these women to spin up some pure bred long-stapled wool, and she at first refused to have anything to do with it. "So long and tangled it was impossible to spin it". She made the attempt and allowed that the wool was good "like silk" but still complained of the difficulty of spinning it.

I have only found one woman so far who knows how to spin a fine thread from longstapled wool, the one who learnt at Darau in Upper Egypt where I believe, there is much weaving of woollen garments. She thins out the thread with both hands in the Scotch fashion and has produced some creditable knitting-wool for me.

(1) *There is an excellent description and photographs of a woman spinning wool in Varia Africana Vol. II P. 176 Plate V. (C. G. Seligman and Brenda Z. Seligman).*

It is only a matter of use and wont, these women have sufficient skill of hand to spin any suitable material, given instruction and opportunity. They spin so rapidly that it is difficult to follow the process—for instance a spinner at Aghebab spun a doubled thread without my ever seeing what she was doing. On enquiry afterwards I found the method is to spin a length of thread, wind it up, start another and when that is spun up, unwind the first length and double the two threads together. It sounds simple when explained, but when seen for the first time looks like a high class conjuring-trick.

Doubling is usually done, however, *after* the spinning on an ordinary spindle, or on a special one with an oval whorl. When a close hard texture is required this doubled thread is used for both warp and woof. I have also seen pieces in which the warp is of doubled thread and the woof two threads used without doubling and others, loosely woven shamlas, in which the thread was single, the women seem quite alive to possibilities in variety of texture produced in these ways.

Weaving of Wool.

There is also a good deal of talent shown in weaving in this country, but I have not been so impressed by it as by the spinning; given such good raw material, and such skill of hand more might be the outcome than dammur alone in cotton goods and shamlas, tentcloth etc. in woollen, excellent as they are of their kind.

I will begin at what may; indeed be considered a beginning, the primitive loom on which shamlas, tentcloths, camelgirths and travelling bags are woven by women. I shall not easily forget the delight of seeing this loom for the first time and watching the conversion of a framework identical with that used for matmaking in Egypt and elsewhere, into a true loom by the addition of a mechanical contrivance for raising the threads, so simple that it may well be taken as one of the first types of heddle to be discovered. It was at Aghebab where I had gone from Rufaa (Blue Nile Province) to see a woman reputed to be skilled in the weaving of shamles. She had no work in hand at the time, but set up a miniature loom for me, which I afterwards took away. I have since seen full sized looms of the type set up in Omdurman and the following description can be taken as general for this class of weaving.

With a 'Bismillah' or a word or two of charm or prayer⁽¹⁾ the weaver plants her loom in a shady spot. She first knocks two pegs into the ground with a stone and places a long stick behind them, the warp beam of the loom to be, then measuring the desired length of the piece to be woven by the span of her hand, she knocks in two more pegs and lays another stick behind them for the breast beam. With another 'Bismillah' she takes the strong 2 ply wool, ties it to the warp beam and passes it under the breast beam and back again over the warp beam, making a continuous warp. If the warp is of any length two workers will lay it, each taking one end and throwing the ball of wool back and forth. When the warp is laid a stick (shed stick) is inserted between the upper and lower threads close to the warp beam and kept there till the piece is woven. So far the procedure is the same as for matmaking: now comes the step in evolution—with a third 'Bismillah' a rod is taken, balanced on the stones set on either side of the warp and laced continuously to the lower warp threads. This is the heddle, essential for all future developments, and the sticks and stones may now be considered a loom. 'Bismillah' for the fourth time and the weaving begins. The worker raises the heddle with the right hand thus raising the lower (odd) threads, beats them with her left hand on the warp beam side of the heddle till the upper (even) threads separate and fall below them, then puts her hand underneath and pulls the even ones well down. They can now be pulled down easily on the breast beam side of the heddle and so make a space (shade or shed) through which the weft thread is passed. To get the countershed, she lifts the shed stick raising the even threads and pulling down the odd ones with her hand, first at the back of the heddle and then in front. No shuttle is used, the thread is wound in a cocoonlike ball, with or without a stick in the middle and poked through the shed with the fingers. It is a tedious business and my first enthusiasm over the primitive heddle has waned since I have sat

(1) *Weavers of the Kababish generally say 'Ya Kabbashi' before they start coupled with an aspiration, that the work may soon be finished and sold, but one I heard cried 'Ya mehawwin' and explained that they were fools who cried on a dead sheikh buried just round the corner instead of on Allah, who alone can make work easy.*

watching for hours together the struggles of the weaver in extricating the clinging odd and even threads from each other. She herself—like all weavers—has much patience—fingers were made before heddles—and works contentedly with a contrivance that does little more than show which threads are the right ones to be raised. Indeed when the end of the warp is neared, she removes the heddle altogether, and makes the shed by alternately raising one set of threads with her fingers, darning them in and out and raising a handful in a bunch at a time. The better workers use a second shed stick, a flat piece of wood which they pass between the threads as soon as the fingers have collected them, and then turn on its side to make a better shed. They occasionally beat up with this stick, but I have not seen any sign of wear on the wood as there would be in the case of a true sword beater. In all cases the really effective beating up is done with a pointed stick or a gazelle horn.

In some cases the warping is done on a third stick which the weaver holds against the breast beam, lashing it to it as she goes along, and keeping all taut with her foot, and this may be regarded as the first step towards a cloth roller i.e. to have the warp tied to a movable rod instead of the fixed loom frame. Sometimes two bits of thread are fastened from the sides of the woven piece to two tiny pegs knocked into the ground, so as to form a tenter and keep the web to its desired width.

I have seen two different ways of strengthening the edge of the material woven, one by using two wool threads alternately and so making long stitches on it, the other by a kind of rude button-holing, sewn in the earliest known way by making a hole with a thorn and poking the thread through it. The thorns are also used to pin down the 'selvage' threads while the worker goes on with the weaving. This loom seems about as simple a type as ever was made, the loom frame (two sticks and four pegs), a shed stick and a heddle (a stick, two stones and a bit of thread). It comes under the class 'Fixed Heddle Loom' as described by Ling Roth⁽¹⁾ but in its simplest form the reason for the name is not very apparent. When the heddle is balanced on stones or baked clay supports it

(1) *Studies in primitive looms* (*Journal R. Anthropological Inst.* vol. XLVII 1917).

is movable, and the worker can and does move it backwards and forwards and upwards, when trying to separate the threads and also moves it along in front of her as the web grows. I have seen however one case in which it was really fixed (that of the Hamar weaver), the rod being lashed to two Y shaped posts, and here it was also raised higher and consequently became more effective.

Ling Roth says that this loom appears to have entered Africa in the north east via Arabia. He gives two illustrations from sketches by F. Goodall R. A. of Bedouin Arabs weaving in Upper Egypt, showing a loom very like these of our shamla weavers here. It is pegged out on the ground and has a heddle resting on a couple of stones; also the strip of woven material shows a resemblance in the pattern of stripes lengthways in the warp. This is a peculiarity of the material woven here, the woof threads are swallowed up in the densely packed warp threads, and stripes set up in the warp consequently show in the finished piece, unlike those textiles in which both warp and woof are seen such as 'Kilim' rugs, in which the beaten up woof hides the warp. By this close laying of the warp threads—each touching the next—perfect spacing is secured in spite of the absence of a reed, and the close hard texture resulting is excellently suited for rugs.

It must be remembered that there is no limit to the patterns that can be woven on these simple looms although the process is laborious: the camelgirths show a rich variety of designs, and the bags different kinds of fringes and attractive lines of stitching (habaka) put in with the fingers. There is a wonderful range of natural coloured wools obtainable, white, brown and black sheep's wool, black, grey and white goat's wool, many shades of fawn in camel wool as well as the pure soft white 'ibil' of the young camel. And one has only to think of the Jeddian rugs with their colour stripes in the same technique or the popular Amria rugs, with their beautiful shades and ingenious use of both this and the 'Kilim' technique, to realise that it would be quite possible to produce beautiful rugs here too, with no more apparatus than the loom used at present for weaving shamlas.

Weaving of cotton.

As I have already said the weaving of cotton is a man's industry. The weavers I have seen do not appear to be organised into guilds, as are men (and sometimes women) in many parts of Africa. Here

each weaver works by himself, and this applies also where as in Omdurman several workers sit in the same hut, each paying the landlord a monthly rent of about 3 P.T. for his pit. They usually weave to order and not for the market, i.e. a woman brings her own spinning, warp and woof, and pays a fixed price to have it woven into dammur, 'merchants stuff' is a common expression for poor weaving.

This procedure applies equally to Omdurman and the villages I have visited, such as Kabushia (Berber Province), Rufaa (Blue Nile), Gebel Moiya (Sennar district) and Berti villages in the neighbourhood of Sherkeila (Kordofan). In all these districts also the same type of loom is in use, the type called by Ling Roth the Pit Treadle Loom.

It is an interesting question how this loom came here. Ling Roth says⁽¹⁾ 'this is the common-Hindu loom it is met with largely in the Green Mountains district of Oman, Arabia halfway between India and Africa ... In Africa it is found among the Gallas⁽²⁾ and contingent peoples ... The pit treadle loom was probably imported into Africa from India via Arabia.

Mr. Stewart tells me that this type of loom is also found in Egyptian villages and in parts of Syria. There is a cut in the Encyclopaedia Britannica (11th. edition Weaving p. 448) of an Indian Hill tribesman's loom which is practically identical with that used in Omdurman. I must leave it to others to discuss whether it reached the Sudan from Egypt or, a more tempting theory, direct from India through one of the Red Sea ports.

The following description applies to nearly all the looms I have seen in this country, so far 23 in number. The only exceptions are the 'fringe' looms of Omdurman, which are practically identical, but much smaller and used for special work — braids and ornamental borders — on which I hope to write a note later, and the looms used by some Berti weavers from Darfur seen near Sherkeila, which were like the others in all particulars except that they had light rectangular frames.

(1) *H. Ling Roth, Studies in primitive looms, op. cit. vol. XLVII 1917.*

(2) *F. J. Bieber, Globus March 8. 1908.*

The pit treadle loom and its fittings.

The loom frame. The thing that first struck me on seeing a Sudanese loom was the absence of a rectangular frame. All the looms I had ever seen before (old and modern English, Swedish, Norwegian, Greek peasant and Egyptian) have such frames with warp roller and cloth beam, types classed by Ling Roth under the title 'Mediterranean Loom'. In the Sudanese loom the frame is represented only by two front posts, stout and short, which support the cloth beam, and a third stouter and taller post which takes the place of a warp roller and which I shall call the warp post. The batten and treadles, of an advanced type, are hung on a rod swinging from the beams of the roof. The weaver sits on the ground working the treadles at the bottom of a pit which gives this class of loom its name — the pit treadle loom.—

How rudimentary such a loom would be considered by an English hand loom weaver may be realised by reading the following passage from Hooper⁽¹⁾: "In order to be useful and lasting the loom must have two principal qualifications (1) rigid strength and (2) geometrical exactness of construction. Without the first of these qualities the loom will be unfitted to bear the accumulating strain of the blows required to beat the cloth together, and without the second quality the material can never be made true and even in texture, whether it be close and solid cloth or open filmy gauze."

The first qualification is indeed fairly well secured by the strong front posts, called *duggäg*, a name suggestive of the importance of their being well beaten in to the ground, and by the warp post also solidly planted in the well trodden floor of the weaver's hut. But the second qualification is not so well fulfilled: it is true that one sometimes sees a fine, strong, evenly woven piece of dammur, but it stands out as evidence of amazing skill on the part of some individual weaver against yards and yards of poor material neither true nor even in texture, their inequalities obviously caused by the inexactitude of the loom, probably also aggravated by defects in the reed to be described later.

The batten, which holds the reed and which is equal in importance to the loom frame because with it the actual weaving is done, is

(1) *Weaving for beginners.*

usually of good construction and of carefully chosen wood. It consists of a lower bar or race block, usually made of sunt wood, whose hardness can stand the shock of constant beating, and an upper bar, (the sword tie) made of heglig; these are held together at the end by a tie of cord round both, and two pegs thrust through a hole in both, the two pegs corresponding to the swords of the English batten. It swings freely from the roof, tied to a rod, called ma'laq — from 'allaqa to hang up—, our rocker or reed swing.

The reed or comb fits into a groove in the lower bar of the batten and is held in place by the upper bar. It is made of narrow strips of gaşab (dura cane) fixed closely together at the top and bottom between two pairs of half round rods, and lashed in place by a crochet of fine cord. This reed recalls the origin of the name, strips of cane or reed having been used for this purpose until the middle of the 18th. century, when strips of steel were substituted for them. The drawbacks of the cane reed are easily seen in Omdurman; fine as is the workmanship in some cases, it is rare to find one without some inequality of space or strip — steel gives greater strength and exactness to the implement. Each strip of cane is called sinn (tooth) the same word as used in England — dent, but dent is used by weavers to designate the space between the strips, and only by loom makers for the strip itself. Reeds are technically described as being so many dents to the inch — I have measured some in Omdurman and found them varying from round about 10 — 12 to the inch for women's dammur to round about 15 or 16 for men's dammur. They are usually made by the weavers themselves, but there is a maker of reeds living at Sheikh Barakat (Blue Nile Province) who has a great reputation.

The cloth beam. The front roller of the loom on which the woven cloth is wound, rests on the Y shaped or hollowed out ends of the short front posts. It has a squared block at the right hand side with holes in it through which a stick is put; the end of it rests on the ground and gives tension to the warp. It is quite effective, but of course it requires more care and intelligence to keep the right tension with it than with the modern ratchet and wheel.

The warp beam is, as we have noted, non-existent its place being taken by the warp post, round which the whole warp in a bunch is bent and tied to a rope leading back to a peg knocked into the ground conveniently near the worker's right hand. This plan of

stretching the warp has its advantages and disadvantages. The absence of a beam on which the warp is spread out tends to a narrowing of the material woven, partly overcome by carrying the warp out as far as possible. The post is called ḥardān, a name alluding to its special function — that it shall be far off. This bunching and tying of the whole warp at the point of tension — the warp post — does give strength to the handspun warp, usually too fine and weak ever to stand the strain of being spread out on the usual back roller with a ratchet and wheel, but it is inferior in all respects to a warp spread out on a back roller where tension is given by a weight box, as in the old English silk loom. A bar called the ḥumār, or donkey, bears the long warp up halfway between front posts and back post, so that it does not sag and touch the floor — it is sometimes fixed to two pegs and sometimes swung from the roof.

Position of the Loom. "Plenty of light" says Mr. Hooper "is essential to good weaving". Some of the weavers in Omdurman sit near the door of the house, so that a strong beam of light falls on their work, but the majority, especially those who work four and five in one room, their webs crossing each other till they look like a colony of giant spiders, sit in a half light which must be equally bad for their health and their craftsmanship.

The Harness of the Loom. The purpose of the harness is to enable the weaver by means of the treadle, to lift certain threads of the warp and depress others in such a manner as to make a succession of openings (shades or sheds) in front of the reed for passing the weft from side to side and thus interlace it with the warp thread". The harness in Omdurman is simple, usually composed of two heddles only; when there are four heddles they are, as far as I have seen, tied together two and two and used as if there were only two (1). The word headle or heddle is used by weavers sometimes in the sense of the whole arrangement used to lift the threads i.e. 2 laths connected by compound loops of strong thread called leashes — and sometimes in the sense of the leash itself, e.g. in Scotland the complete heddle is called a lamb and the leashes the heddles. To avoid confusion, I shall use leash for the individual loops and heddle for the complete set. The Arabic equivalent for heddle — nīr, or nīra, is also used in

(1) *Taking the back heddles as No. 1 I have noted these threadings on the four headle harnesses seen (1) 1323 (2) 1423.*

the double sense, no doubt it dates back to the primitive type we have seen in the shamla loom, where the heddle is a continuous thread wound over the supporting lath, and has no distinct leashes.

The heddles hanging on a Sudanese loom look very like European ones, except that they swing from the same bar that carries the batten, instead of from one of their own, but on examination they are seen to be very different.

Our leashes are all separate, each consisting of a thread tied up in three loops, two long ones, and one short one called the eye, through which the warp thread passes. They are made on a gauge because they should be all exactly equal, indeed, it is said that a perceptible difference will appear in the weaving if some of the leashes are made by one person and some by another, even though both be good and careful workers. The Sudanese leashes also are made on a flat wooden block with a handle called "lōh el nīr" (Fig. 7) but continuously not separately.

I will describe the process as seen at Rufaa.

How to make a spiral continuous heddle.

The worker takes a stick and a piece of strong twine, and holds them on the top of the gauge. Then from a ball held in the other hand he winds the heddle thread round the gauge and then fastens it round the stick and the string by a clove hitch knot; he repeats these loops and knots until he has as many loops as leashes required and then slips out the gauge and the stick and lets the knots tighten over the string. The top lath of the heddle is now slipped through the loops and the string is tied to it at both ends. One half of the heddle is now complete, and as the set of loops hang from the lath one notices how like it is to the whole heddle of the shamla loom.

To make the other half the gauge is taken again, the stick and another piece of string put on top of it, and loops again made round it, only this time, as the thread comes round the gauge it is put through the opposite loop hanging from the heddle lath. Again the gauge and stick are removed and the string tied this time to both ends of the lower lath, which, slipped through the loops, weights them down. The space between the interlaced loop ends forms the "eye" through which the warp thread is passed.

The thread used for the heddle leashes is often excellent, strong,

fine and even; it is made by doubling two hardspun threads on the spindle, or special doubling spindle with oval whorl.

The heddles, completed, are hung up and connected with the treadles. The method of hanging can be seen in the illustration, the upper bit of wood gives play, as is done by a roller or pulley at home, the arrangement is appropriately called the "mizān" or scales; the weaver has to see to it that the rods hang level, they keep the heddles true.

The heddles are tied to countermarches and these again to two comfortable flat treadles fixed to pegs down in the pit.

Warping. Although this is an integral part of weaving it is done by women in their houses or hoshes on iron pegs fixed in the wall. The pegs often have an upward curve to prevent the warp from slipping off. The total length of the desired warp is measured on the wall, sometimes straight along but more often doubled back and forth to save space and the fatigue of walking the length of the warp. A common warp length is 17 dirā'—the cubit being measured by the worker's own arm—supposed to give 16 dirā' when the piece is woven up.

I will describe the process in its simplest form, a short length laid on three pegs only. Peg A is at one end of the length, Peg B at the other, Peg C in the same line a few inches from Peg B.

The worker takes the spindle in her right hand and after tying the end of the thread to Peg A begins unwinding it gradually, walking along with it, carries it *over* C under and round B and back under C, thus making the all important crossing between B and C she then carries it back to A and two threads of the warp are laid. When she has laid 40 threads, she ties them between C and A, close to C. This tie is called the "rubṭa" and is also spoken of as "the twenty" meaning 20 threads in pairs "bi gōz". It is used in estimating the width of a warp—e.g. if a warp is said to be one of 9 rubṭ it means one of 360 threads plus a certain number of selvage threads called by the same name "ḥajra" as the strengthening stitches on the side of the shamla. 5, 7 and 9 rubṭ are common sizes for warps in Omdurman, and they are called Um khamsa, Um sab'a etc. while reeds of suitable size to take them are known as Abu khamsa, Abu sab'a etc.

This way of laying a warp is sure, and no doubt has some advantage where a very frail thread is concerned, but it is extremely slow.

In the most primitive form of warping that I had previously seen, 6 threads were warped at once, on similar pegs laid in the floor, so that by the time the warper had carried them *once* round the pegs 12 threads had been laid instead of two, and of course, on a warping mill it is possible to lay as many as a hundred at once.

I cannot believe that all the warps laid in Omdurman are done in so tedious a way, but this must wait for more investigation. When the warp is laid the worker makes a tie on either side of the crossing to secure it and also one at the end of the warp.

Beaming. After a length of cloth has been woven, a shed stick is slipped into the shed between the reed and the material. Then the cloth is cut off, leaving a narrow strip behind the shed stick. The threads of the warp end are left hanging from the heddles. The weaver takes the new warp and cutting the ties which hold the crossing lifts thread by thread in their order and fastens them to the old warp threads with a most ingenious twist—a twist which I believe to be the same still used for joining threads by the “piecers” in our mills at home. When all the threads are joined the shed stick is pulled back, drawing the new threads after the old ones through the heddles and the reed, and is tied to the cloth beam.

The warp lying on the other side of the heddles is then gathered up, there is no other crossing in it and lazy rods are rarely used, it is simply bunched and fastened to the warp post as already described,—one watches the weaver expecting disastrous entanglements, but the soft cotton threads do not cling much to each other, and the only drawback seems certain inequalities in the weaving due to uneven tension.

Entering, is only done when a new harness is brought into use, and I have not yet seen it. As far as I can make out from descriptions, the warp is entered on the loom, first through the heddles and then through the reed. The fingers only are used, and the reed hook is unknown.

Tools used in Weaving.

The shuttle is boat shaped and known as the “merkab”. It varies from 10 inches to 12 inches in length and from $1\frac{1}{2}$ inches to 2 inches in breadth. It has no spring, the hard wire in its hollowed out bottom for carrying the spool slips into a hole at one end and into a cleft at the other, where it is held down by a tiny slip of cane put

across the cleft through a little hole in the end of the shuttle. A blue bead is often put into the hole in the side of the shuttle to make an eye for the weft thread to pass through.

The favourite wood for the shuttle is heglig (*Balanites aegyptiaca* Del), I have also seen some said to be made of tundub (*Capparis aphylla*) and mokheit (*Boscia senegalensis*); Mansur of Zeidab has a great reputation in Omdurman for making shuttles out of heglig.

The spools for the weft are hollow bits of cane, dura or dukhn stalk, or ambatch.

The usual method of transferring the spun thread from the cone to the spool, is to put the cone into a basket or pot, or let it run on the floor, tie the end of the thread to the spool and put the spool on the spindle top, with a scrap of cotton to wedge it if necessary. The spindle is then twirled on the hand and the spool is rapidly filled, unless the cone becomes tangled up, as is not uncommon.

Before weaving, the spools of weft are dipped into soap and water, and the thread is thrown across while still damp—the warp is also washed with soap and water, but it is dry when it is entered.

The tenter or temple. Two crossed pieces of bamboo with steel teeth are used as a tenter to keep the web at the desired width in Omdurman, and the Berti weavers have also one straight piece of cane with a pin at each end which they use in the same way.

There is much to admire in the craft of most of the weavers I have seen—they throw the shuttle swiftly and delicately, and often achieve excellent results in spite of their rudimentary loom. Nor do I believe that this delicacy and skill of hand is confined to men. Three Sudanese girls have tried to weave on my own scarf loom, and I have been amazed at the progress they have made in the few hours possible. Surely any teacher of weaving would feel hopeful over three pupils who in their first six lessons never dropped the shuttle once!

The craft is capable of development, I am sure, in this country—for boys as a trade, for girls as a home craft. As a trade it has been moribund for many years here, and the opportunity given the hand weavers by the present high prices and low quality of machine made textiles has not yet been realized by the old and ignorant workers in Omdurman; some outside stimulus is needed, and then development will come. One could use plenty of arguments in favour of encouragement of such development, on the commercial and utilitarian side, but I look at it from the educational point of view. Dexterity of hand,

watchfulness, perseverance, patience, love of colour, intelligence in design, are all fostered by this craft as has been often observed, what more does the educationalist want?

List of technical terms used in weaving and spinning.

Pit treadle loom.

Loom.	nöl.	(Egyptian, known but not used locally).
	dukkān (Omd.)	shakka (Berti).
Cloth beam.	törög.	
Warp post.	hardān,	sanab.
Batten.	daffa.	
Upper part of batten.	jemel,	daffa.
Lower " " "	nāga,	garāra.
Warp.	sedā,	sedāya.
Woof.	lahm.	
Rope to which the warp is tied.		seliba.
Post to which the rope is tied.		jarāi.
Reed.	mishṭ	
Dent in reed.	sinn.	
Peg in batten (sword tie).	kashū,	khuruz.
Heddle lath.	jerid el-nira.	
Heddle	nir,	nira.
Rod supporting heddles and batten.	mu'lag,	totāhan (Berti).
Treadles.	na'l.	
Counter-marches.	rikub.	
Pit.	ḥufra.	
Shuttle.	merkab.	
To weave.	nasaj.	
Small rods supporting heddles.		mizān.
Tenter.	mushḥat.	
Stick fastening clothbeam.	luwāi,	akkam (Berti).
Cotton cloth.	dammūr.	
Length of cotton.	fitga.	
Piece " " "	tōb.	
Warp support.	ḥumār.	
Shed stick.	gabbāḍa.	
Selvage.	ḥajra.	
Crossing (in warp).	nefis.	

Shamla Loom.

Warp beam.	el-'amūd el-giddāml.	
Breast beam.	el-'amūd el-warānl.	
Pegs.	autād.	
Shed stick.	ḥaff, ḥau	
Heddle.	nīra.	
Stones supporting heddle.	ḥidba.	
Pegs used as tenter.	mushḥāt.	
Piece of wood used as shed stick.	mulḥaz.	
Beater in.	hilāl (pointed stick),	munsag (gazelle horn).

Spinning.

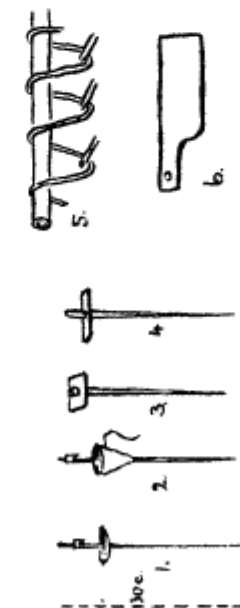
To spin.	ghazal, yighzil.	tarr yeturr.
Spindle.	mughzal, (wool).	mutrār (cotton).
Whorl.	dirra.	
Notch on pillar.	dign.	
Spool.	būṣ.	
Bamboo hand gin.	ghoghaiya.	sāgiat el-guṭn.
Bow for teasing.	mutrāg.	
Teased.	manfūsh	

OMDURMAN.



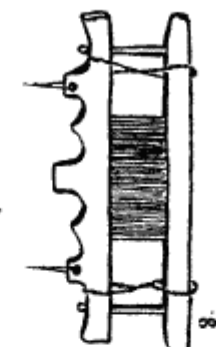
FIXED HEDDLE LOOM

PIT TREADLE LOOM



SPINDLES.

5. LEASHES OF FIXED HEDDLE LOOM. 7. LEASHES OF PIT TREADLE LOOM.
6. HEDDLE GAUGE (P.T. LOOM)



8. BATTEN

NATURAL HISTORY NOTES.

BY H. H. KING.

The following notes were made during some three months of the past winter spent on the river in Dongola Province. They are necessarily scrappy being in the main merely extracts from my field book, but may be of some little interest.

A very common animal on the riverside cultivations is the Mongoose or Abu Afina—*Herpestes albicauda* F. Cuv. It spends the day in burrows in the ground, emerging shortly after sunset, when it may be seen singly or in pairs trotting along the riverbank in search of food. It is a fearless little creature and will come boldly up to within a few yards of where one is sitting, even though there may be dogs lying at one's feet. If alarmed it behaves very much as does a cat under similar circumstances—it raises itself on its toes, arches its back, erects the hair on its back and tail and tries to make itself appear as large and ferocious as possible. If molested it emits an extremely disagreeable smell. It can gallop at a fair pace for short distances but is not fast enough to escape from a terrier. With the exception of English dogs it has few, if any, enemies for I doubt if a native dog would ever attack a mongoose. Its food is usually said to consist of snakes, rats, chicken, eggs etc. but the specimens I have examined proved to have been feeding entirely on insects. One killed at 10 p.m. had its stomach completely filled with insects, including the following:—2 large locusts, several small locusts (gabura), a number of crickets, a few cockchafers and 30 to 40 green stink bugs (*Nesara viridula* Linn). Generally speaking stink bugs are considered unpalatable and have few natural enemies; I have heard of Nubas eating the black stink bug (*Aspongopus viduatus* Fab.) found on melons, but imagine this was done only under the stimulus of excitement, as at a dance. The mongoose would however appear to prefer them to less highly seasoned food. All the insects mentioned above are enemies of the farmer so the Abu Afina may be looked upon as the farmer's friend. It is possible that occasionally it is guilty of stealing an egg, if it can find one, but in the main I believe it to be an insectivorous mammal and one which should always be protected and encouraged.

The fox (*Vulpes vulpes*, subsp. *egyptica*, Sonn.) found in Dongola Province is subspecifically distinct from the fox (*Vulpes vulpes*, Linn.) preserved in the British Isles as a beast of the chase but very closely resembles it in appearance. Its "earth" may be either on the cultivated land or in the rocky hills behind the cultivations, but though mainly crepuscular in its habits it does not necessarily retire to its earth for the day, frequently lying rough in the crops. Most of its hunting and feeding is done under cover of night but I have seen a fine dog fox at 10 a.m. carrying a Lichtenstein's sandgrouse which I had winged the previous evening and been unable to recover. It was a handsome animal as it halted for a moment in the bright sunlight with one fore foot raised and though I particularly wanted the sandgrouse for the sake of its skin, I could not bring myself to shoot it. Somehow, even in the Sudan one cannot shoot a fox, without feeling that one has committed a crime. I always like the story of the small son of an M. F. H. who when asked why Adam was cast out of the Garden of Eden replied "He shot a fox".

Here, as in England, the fox or "Abu Hussein" is noted for its cunning. One of the stories told of it is that an old woman coming home from the sūk carrying a guffa of monkey nuts found what appeared to be a dead fox lying on the path. Thinking the skin would be useful she picked it up, and put it in the guffa, but when she reached her destination and opened the guffa the fox jumped out and ran away. It had eaten all the monkey nuts and the old woman was left lamenting. As this story indicates, the fox in Dongola Province is not wholly carnivorous; in fact, I believe it to be largely vegetarian in its habits. The stomach of a vixen I examined contained, with the exception of a small fragment of dry goatskin, nothing but maize, and natives assert that foxes sometimes cause considerable damage to maize crops. Dates, too, when on a young palm and so within reach are freely taken and I am of the opinion that although the fox probably kills a certain number of rats and insects it is scarcely deserving of being classed as a useful animal. Like the mongoose it has few enemies other than English or partly English dogs.

This winter I noticed that there were far fewer native dogs in the province than was the case some years ago. I do not know the reason for this but suggest the following. Owing to repeated plagues of the aphid known as the "Asal fly" which attacks dura, far more maize is grown than formerly. The native dog, practically omnivorous

and always hungry, looks upon maize as a useful standby when more palatable food is unobtainable and like the fox, sometimes causes a fair amount of damage to maize cobs. The natives are aware of this and I have heard a heated discussion being carried on as to whose dog it was which had been eating a certain man's maize. I have also seen a cumbersome, but effective, snare set for dogs alongside a small patch of maize, and I am inclined to believe that the decrease in the numbers of dogs is due indirectly to the increase in the areas sown to this crop.

The loss in grain to natives caused by the depredations of doves, of which there are three common species, must be very considerable. The largest of the three, *Streptopelia decipiens*, Finsch and Harth, is known as the "debbās" but the remaining two *S. turtur* Linn. and *Stigmatopelia senegalensis* Linn. are usually termed "gimri". A fourth species, *Streptopelia roseigriseus* Sundev., of which I saw a few specimens at Genetti, bears the name of "bayada" in some parts of the Sudan, but I did not hear this name used in Dongola. I have counted an average of over 200 grains of dura in the crops of six debbās shot on an island where a crop of dura was ripening. When wheat is being sown small flocks of doves watch the seed broadcasted and then as soon as the sower has moved a few yards away, come down to feed. The natives try to scare them away when they are taking grain but, I believe, never make any attempt to lessen their numbers by netting or destroying their nests. It is true that one sometimes finds a few weed seeds in the crops of doves, but the good they do by eating the seeds of noxious weeds is infinitesimal.

The beladi sparrow, *Passer rufidorsalis* Brehm. though often causing marked damage to grain crops also doubtless helps the farmer by devouring insects. Last summer this bird became comparatively scarce throughout the Province and is believed to have migrated to rainlands to feed, as it returned in October and November. It breeds in the province, so should always be fairly easy to control. The Spanish sparrow, *Passer hispaniolensis*, Temm. on the other hand has nothing in its favour as far as Dongola is concerned. Believed to breed in Southern Europe, it arrives in countless myriads in November and stays till March feeding throughout the winter months on dura, dukhn, beans and in fact almost any crop which produces seed.

Another bird which affects the farmer to an appreciable extent is the Nile goose, *Alopochen aegypticus*, Linn. When the young wheat

and barley is coming up large flocks assemble to feed on it at dusk and during the early hours of the night, and the following morning the crop looks as if it had been grazed over by sheep. This winter I saw a few specimens of the white fronted goose, *Anser albifrons* Scop. (a grey goose with a white patch on the face) also feeding on young wheat, but this species though common in Lower Egypt during the winter months is rare in the Sudan. It is a winter migrant, said to nest in the Arctic circle.

Four species of sand-grouse were noticed in the province. Of these, the three which come to the sandbanks to drink in the early morning may be distinguished readily by the following characteristics.

The crowned sandgrouse, *Pterocles coronatus* Licht. occurs in coveys of up to 16 or 20. It is a large bird with no long feathers in the tail and the cock has a black stripe on either side of the face extending backwards from the beak. Its flight is straight and steady.

The spotted sandgrouse, *Pteroclorus senegallus* Linn. is comparatively scarce and usually seen in pairs. In size and in its style of flight it resembles the crowned sandgrouse but it has two long pointed feathers in the tail and the cock has no black markings on the face.

The singed sandgrouse, *Pteroclorus senegalensis (exustus)* Licht. occurs in coveys of up to 30 or 40. It is a smaller bird and appears to glory in its great powers of flight, frequently wheeling and circling at a great height for some considerable time before coming down to feed. There are two long pointed feathers in the tail but no black markings on the face of the cock. The feathers on the hind abdomen are a rich brown colour.

All these three species may be seen feeding on fallow cultivated land where the weed known as amioga, *Tephrosia apollinea* D. C. flourishes, the seeds of which constitute their chief article of food, either before or immediately after they have taken their morning drink. Occasionally I have noticed crowned sandgrouse feeding in the late afternoon. Unless they have been shot at they are by no means shy when feeding, and will often allow one to approach to within a few yards. Having drunk and fed to repletion they leave the cultivated land and presumably go for varying distances into the desert.

The fourth species observed in the province was that known as Lichtenstein's sandgrouse *Pterocles lichtensteini* Temm. This sandgrouse rather resembles the English partridge in its habits in that each covey occupies a certain small area in which it may always be found.

The birds lie close and if walked up drop again within a few hundred yards. The flight is not unlike that of the woodcock. In general colour both sexes are much darker than are any of the above mentioned three species and the cock has patches of snow white feathers on the top of the head. There are no long feathers in the tail. Only two coveys were seen and the species appears to be scarce in the province.



SCIENTIFIC RESEARCH COMMITTEE.

An advisory body has been formed recently part of whose duties is the collection and distribution of scientific information of local interest. In this connection it is proposed to publish in the "Sudan Notes and Records" short notes dealing with matters which are forming the subjects of investigations in this country. The Committee would be glad to receive from correspondents in any part of the country information on scientific subjects of local interest: it would also be pleased to give any information in its power to those interested in a particular matter.

The Committee consists of the following:—

The Director of Education (Mr. J. W. Crowfoot), the Director, Wellcome Tropical Research Laboratories (Major R. G. Archibald), the Government Bacteriologist (Capt. B. Spence, *acting*), the Government Botanist (Mr. R. E. Massey), the Government Entomologist (Mr. H. H. King), the Government Geologist (Mr. G. W. Grabham), and the Government Chemist (Dr. A. F. Joseph).

All communications intended for the Committee should be addressed to the last named, who has been appointed Secretary.

A Note on the Maintenance of Quality of Cotton Grown in the Sudan.

In order to ascertain whether cotton brought from Egypt deteriorates in quality and becomes later each successive year that the seed resulting there from is used for sowing, the records accumulated at the Botanical Laboratory since 1913 were searched to see the exact effect of growing Egyptian cottons at Khartoum North. The appearance of the first flower has been taken as an index of earliness, and the length of the lint as an indication of the effect of the environment.

Date of first flower from time of planting.

1915	Sakel	. 66 days.	
1920	"	67 "	
1921	"	72 "	(delayed by heavy floods).
1913	Affi	63 days	
1921	Various strains derived from the above, } even when delayed by floods.		67—75 days.

An interesting case is that of Dr. Balls' No. 77. This cotton is stated to be an early variety, but on his pedigree charts the date of the first flower is given as 109 days from planting in Egypt. After seven years at Khartoum North however the date of the first flower this season was 67 days from sowing. It is also worth recording that the original length of staple is given as 28—33 mm, but as a result of constant selection we have now strains averaging 39 mm. in length.

Turning to the staple, the examples given below show the improvement of Sakel cotton since it was introduced. It should be noted that this improvement has been more than maintained in seed issued to agricultural stations in the provinces, and provided that a small area is sown each year with seed from the central breeding station there is no reason why any deterioration due to crossing in the field should not be overcome as rapidly as it appears.

Year	Length in mm.	Notes.
1915	33.2	Year of introduction from Egypt.
1917	35	Average of whole crop.
1918	36.3	" " " "
1921	38	" " " " Selected strains now being propagated exceed 40 mm. in length.

R. E. MASSEY.

The Spanish Sparrow in Dongola.

One of the most interesting and at the same time most urgent of the problems connected with the protection of agricultural crops in the Sudan from their pests is that of the control of the Spanish sparrow, *Passer hispaniolensis*, Temm., in Dongola Province. First

recorded by Nicoll in 1911 as occurring in that province, in 1914 it was reported to be causing serious damage to grain crops while in the winter 1917—18 it is believed to have taken 90% of the demira dura.

Unlike the local sparrow, *P. rufidorsalis*, Brehm., the Spanish sparrow does not nest in the Sudan but is a winter visitant from Southern Europe or possibly Asia Minor. It arrives in November and leaves in March, feeding during the four winter months on dura, dukhn, wheat, barley and in fact almost any crop bearing edible seed. It is gregarious, feeding in flocks, and the flocks collecting together at night to roost. It prefers to feed on the heads of standing crops and is comparatively rarely seen taking food from the ground. Natural enemies (hawks, cats, etc.) destroy a small proportion and one, *Simulium Griseicollis*, Becker a small bloodsucking fly, is believed to affect its movements considerably and even possibly in some years, to kill large numbers.

Experiments have been carried out involving the use of strychnine, sulphur dioxide, gelegnite bombs, shot guns, birdlime and nets, while consideration has been given to the possibility of employing other poison gasses, flame projectors and disease. It is impracticable to modify to any great extent the cultural methods in vogue and unlikely that natural enemies could be exploited. Results obtained from research carried out up to the present indicate the possibility of driving the birds at night when enormous numbers are crowded together, into long lines of nets erected in rides cut through the thickets in which they roost. It has been demonstrated that under certain conditions on moonless nights provided that no lights are exposed they may be induced to keep together and fly at a height not exceeding 25 feet in a definite direction and that if a net is in their path they will not avoid it. An experiment based on these lines has been planned for the coming season with the object of ascertaining whether such numbers of *P. hispaniolensis* may be caught with nets as will result in the reduction of the damage caused by this pest to insignificant proportions.

H. H. KING.

Investigations at Halfa Quarantine.

When the prospect arose of 20,000 labourers from Southern Egypt being concentrated at the Gezira Irrigation Works in the Sudan, it became necessary to consider the means both of preserving the health of the labouring force, and of protecting the indigenous population of the Sudan from diseases likely to be introduced by that force.

Such diseases fall naturally into three types according to the classification of their causal organisms—bacterial (e.g. cholera and plague), protozoal (e.g. relapsing fever and probably typhus), and metazoal (e.g. bilharzia and anklostomiasis). The extent to which the labourers of Southern Egypt harbour metazoal parasites was made the subject of special enquiry at Halfa Quarantine Station this season.

Metazoa are multicellular animals which lead parasitic lives at the expense of their hosts. The damage to the host depends on the numbers and position in his body of the parasites he harbours, the toxins he absorbs from them, the proportion of his food they absorb, and the secondary bacterial infections to which they may give rise.

Epidemics of bacterial and protozoal origin appear with dramatic suddenness, destroy large numbers of people in a short time, and disappear as suddenly as they come. Metazoal diseases, on the other hand, are insidious in their onset, and characterized by chronic endemicity; whole communities held in their unrelenting grip become degenerate, sick, and discontented. The low standard of general health leads to serious diminution in the aggregate labour capacity of the community, and to a high death rate.

The two metazoal diseases of Egypt of importance to the Sudan are Schistosomiasis ("Bilharzia") and Ankylostomiasis ("Hookworm disease").

Schistosomiasis is due to the presence, in the portal veins, of the flat worm *Schistosoma* (Weinland 1858). Here the female lays spined eggs which find their way to the accompaniment of bleeding into the bladder, or rectum, according to whether the parent worm is *Schistosoma haematobium* or *Schistosoma mansoni*. If these eggs reach free water, swimming miracidia emerge; these die in 24–48

hours unless they find and enter one of their definitive intermediate hosts, certain water snails, of which *Bullinus Contortus* and *Planorbis Boisseyi* are the commonest. In these they form sporocysts, daughter sporocysts, and finally cercariae which escape from the snail and are then capable of piercing the skin or mucosa of man when drinking or bathing. Once into the tissues of man they migrate, growing all the time, and eventually, settle down as adult worms in the portal veins where after copulation the female starts laying the spined eggs and so keeps up the vicious circle.

In order to find out the extent to which the labourers recruited from Southern Egypt were infected, the opportunity was taken of examining microscopically for *Schistosoma* eggs the urine of 14,077 men who passed through the quarantine station between October 1920 and February 1921. 18.5% of the men were found to be infected. If they remain in the Irrigation area, these men will, sooner or later, become a menace to the health and economic efficiency of the community once water has been admitted to the canals and carrier snails, which already exist in the Sudan, have established themselves there.

Prophylaxis will consist either in the entire exclusion of *Schistosoma* carriers from the area, or in the establishment of a standard of personal and communal sanitation which will preclude the possibility of eggs voided by carriers gaining access to drinking or washing water.

Ankylostomiasis is due to the presence, in the upper part of the small intestine, of the round worms *Ankylostoma Duodenale* and *Necator Americanus*. The eggs of these worms pass out with the bowel contents of the host, and if they are deposited in damp soil, minute actively motile larvae hatch out. These, after a period of development, are capable of piercing the skin or mucosa of man either when washing or drinking. Once through the skin, they enter venous blood vessels passing thus to the right heart and lungs. From here they work their way out of the capillaries into the lumen of the air cells, travel up the bronchi, trachea and larynx into the oesophagus, and so via the stomach to the intestine where, after this adventurous journey occupying seven to ten days, they settle down and rapidly

reach maturity. After copulation, the female lays eggs which, passing out of the host, may, in turn, infect other people.

In order to find out the extent to which the labourers of Southern Egypt suffered from Ankylostomiasis 6641 were treated with the powerful anthelmintic, Thymol, and the worms recovered counted and classified; 19.3% were found to have ankylostomiasis. Other less important worm infections were noted such as Oxyuriasis due to *Oxyuris Vermicularis* (Thread Worm) 27.7%. Ascariasis, due to *Ascaris Lumbricoides* ("Round Worm") 2.5%, and Taeniasis due to *Taenia Saginata* ("Tape Worm") 2.3%.

Prophylaxis is comparatively easy consisting in treating the sufferers so as to remove the worms, and maintaining the same standard of general sanitation as that required for the control of Schistosomiasis.

BASIL SPENCE.

NOTES.

The Manufacture of Iron by the Juers.

Extract from Sudan Intelligence Report No. 117 (Jan. 1904).

The ore is extrated from the pits at no great depth from the surface.

The iron ore I consider to be pyrites.

The smelting furnaces are built in the 'Agaba, and the Sheikhs when I asked them were very loath to say anything concerning them; and on asking the reason why, they said that when a man wanted to burn the iron he went into the 'Agaba for two or three months at a time, and during that time he never let any woman come near him, for if she did it would spoil the whole of his work, but when they had smelted the iron they brought it back to their tukls and made it up into whatever was required.

The smelting furnaces are made of baked mud, and are about 3 feet 6 inches to 4 feet high and 2 feet in diameter; the air is admitted to the bottom of the pipe by 4 small pipes of baked clay, the furnace is then half filled with wood charcoal, which is set alight, and the iron ore which has been crushed is thrown on the top. The iron is melted out and runs to the bottom of the furnace, the draught from the four pipes at the bottom of the furnace is sufficient to keep up a high enough temperature, for bellows are not used with these furnaces.

NOTE. It is probable that the writer of the extract was in error about the absence of bellows as the process described is exactly similar to that used by the Zaghawa at Nakud, but they applied a pair of bellows to each of the four pipes. The bellows consisted of a sheep or goatskin fitted with a tube at one end and a pair of slats sewn to the outer end, and the opening and shutting of the slats by the hands took the place of a valve. Each furnace required two men who plied the bellows one in each hand, and the occasion of a smelting was always one for much merris drinking. The object of this was probably to enable the workers to carry on working as they had to go on at the bellows by shifts all night, and nothing but unlimited drink would keep them to it. I am unaware of their abstaining from female society.

C. A. W.

The Reason for the Beir's Hatred of the Dinka:

Extract from M. I. R. No. 134 September, 1905.

A very long time ago the Dinkas drove a certain woman out of their country into the jungle. When driven out this woman was enceinte, and her child, a son, was born in the jungle. Their only food was leaves and roots. When the boy was grown up the woman tried to rejoin her tribe, but they recognised her and drove her away again, and her son with her. The woman asked the boy to leave her and rejoin his people who might take him if she was not with him. He refused and suggested that she should marry him, and their children would form a new tribe. This was done. The tribe became known to the Dinka as the Beir, which they say is their word for "orphans". The founders of the tribe told their children always to harass the Dinka in revenge for having ill-treated them.

Attention may be drawn to the close resemblance between this tradition and the story of Ishmael as told in the Old Testament.

Hawks and verandahs.

A very curious instance of what is sometimes called the 'balance of nature' came under my observation some time ago. Most people are familiar with Darwin's somewhat fanciful example that the prevalence of clover in a district may depend on the number of old maids in the nearest village. The argument ran: Old maids keep cats, cats eat mice, mice eat bumble bees, bumble bees fertilize clover. My own observation that the accidental passage of a hawk at a certain moment may cause many pounds worth of damage to the woodwork of a house, may seem startling, but I can prove it by the following actual observations: Having stated the fact it might interest readers to try and guess the connection before reading further.

I and another Inspector were sitting out one evening at Dongola when a hatch out of white ants occurred near by. That is to say from cracks in the lawn all round us emerged thousands of winged sexual adult white ants. Round the holes from which they emerged sat toads and lizards gorging themselves on the ants before they could

stretch their wings and leave the ground. Sparrows, bulbuls and bee eaters hovered round and snapped them up as soon as they had got on the wing. We amused ourselves by speculating on the chances of any individual ant escaping: we watched many hundreds, but none got away. Many seemed to have passed out of the danger zone, but a bulbul or a bee eater would make a swoop and the ant was gone.

Suddenly all was changed — every bird slipped into cover in the nearest bush, and a hawk swooped past and was gone. In less than a minute the birds were out again and accounting for the white ants as before, but — perhaps some fifty had escaped in the interval and each was the potential founder of a new white ant's nest of thousands of individuals. The connection between white ant's nests and the nearest verandah post may I think be taken as established.

With the introduction of new agricultural conditions into the Sudan — such for instance as huge areas under cotton cultivation — long practice and experience will be necessary to find out what animals are beneficial and what the reverse. In this particular connection most people would have agreed before hand that white ants are an enemy to the timbers of a house, few would have looked upon toads, lizards, sparrows, bulbuls and bee eaters as protectors of woodwork. None, I venture to think, would have prophesied that the chance passage of a hawk would have had any influence one way or another, but it is clear that this particular chance occurrence may lead to hundreds of pounds worth of loss and damage.

W. R. G. Bond.

CORRESPONDENCE.

THE KABABISH (*S. N. & R. Vol. III, p. 281*).

There appear to us to be so many misconceptions in Mr. Davies' criticism of our paper "The Kababish" (*Harvard African Studies. Vol. II. 1918.*) that some comment seems necessary.

It is a pity that Mr. Davies should have attributed all errors and opinions to which he does not subscribe, to ignorance and inaccuracy on our part. There are so many mistakes in the English that a little common sense or common fairness might have suggested that there was another possible explanation for misstatements and misprints even if the copy sent to Mr. Crowfoot for review did not have pasted in a typed slip (it is believed that all copies sent out had this) pointing out that owing to enemy action the authors did not see proofs of the paper. Further Mr. Oric Bates (whose death during the war has dealt a heavy blow to African research) altered the transliteration we had used to the system adopted in *Varia Africana*, so that here a further source of error was introduced.

In what follows, *N & R* is placed before references to Mr. Davies' article, *V. A.* before references to our own.

We do not agree that the sentence "The yearly migration to the north west is indeed such a special feature of Kababish life..." (*V. A.* p. 120) implies that this yearly migration is "exclusively a Kababish habit" (*N & R* p. 282), moreover we point out (*V. A.* p. 116) that in Northern Kordofan a special effort is required of the nomad Arabs generally to meet the severity of the dry season. As regards the exact meaning of *nesuk* (1), we hold that Mr. Davies' footnote severely qualifies the force of his own criticism (*N & R* p. 282). The arm of coincidence is proverbially long, but that Mr. Davies really believes that we could have hit upon a meaning so close to that given by his Wadai informant if it were not a recognized meaning and had not been given to us, indicates a fundamental difference between our ideas

(1) *The s of nesuk and further down of suka etc. which was distinguished typographically in the original, stands for the sound of sh.*

as to the nature and use of evidence. We also think it probable that we heard the word pronounced (dialectically) as we wrote it.

With regard to Mr. Davies' difficulty in reconciling two of "Dr. Seligman's general propositions" (N & R p. 282), we would point out (1) a Beja origin for a section or subsection does not necessarily imply the absorption of any considerable number of Beja into the tribe or even the presence of much Beja blood; sections and subsections habitually take their names from those of ancestors real or fictitious. On this point we would refer to our own paper (V.A.p.182) and we would add (2) a number of Kababish customs are similar or even identical with those given by Robertson Smith for the pagan Arabs of Arabia.

Mr. Davies writes (N & R p. 283) "Justice has not been done to the paramount position of the Nazir, who administers his tribe through a multitude of sheikhs of subsections. Some of these, by reason of age or force of character or the number of their followers are men of fair influence, but the majority are petty people, subject to dismissal, to fine and even, secretly, to imprisonment by the Nazir, who also ratifies their appointment, after an election by their people in which considerations of hereditary right have much force". We write:— (V. A. p. 112) "There is a paramount sheykh of the tribe by whom in the old days the sheykhs of the khashm biyut were said to have been appointed; as a matter of fact they appear always to have held office by hereditary right. Appeals against the judgment delivered by the sheykh of the khashm beyt can be taken to the sheykh of the tribe, and such appeals are not uncommon. In the matter of tribute paid to the government, the paramount sheykh decides how much each khashm beyt shall provide, and tells each sheykh to levy so much from his division. The sub-sheykhs thus act as the executive officers of the paramount sheykh, who, in theory, is entirely responsible for the policy of the tribe as far as it relates to external affairs. But it must not be forgotten that in all internal matters the sheykhs of the khashm biyut wield a very real authority, while at all times the freest discussion goes on and the fullest weight is given to tradition. In periods of distress the sheykhs, and even the heads of families, may take each his own line. This occurred during the Mahdia, when the Kuraysh section of the sheykh's family, as well as certain sections of foreign origin who had for years reckoned themselves Kababish, went over to the Mahdi, in spite of

the fact that the majority of the tribe remained loyal under the leadership of Salih Bey, whom the Mahdi later beheaded".

It is difficult to see that we have underrated the sheikh's political power nor do we agree that what we have written differs essentially from Mr. Davies' statement. The fact that the Kuraysh section did break away during the Mahdia and that at the time of our visit there were rumours in the tribe that they might again secede, shows that the authority of the Nazir is less absolute than he supposes. We may point out that while a Government officer has especially good opportunities of acquiring certain forms of knowledge, our experience has shown us that he commonly tends to overestimate the importance of the tribal chiefs with whom he works. If this is the case in the Sudan, let us add that we believe it occurs elsewhere in Africa, and one of us has had considerable experience of it in Melanesia. On the other hand, we certainly underestimated the economic position of Sheikh Ali el Tom in his own feriq.

Mr. Davies writes (N & R p. 283) "the authors' ignorance of Arabic leads them not only into verbal inaccuracies but into errors of interpretation" and he quotes six inaccuracies in the transliteration of Arab words. We have already explained the circumstances which lead to our work being loaded with misprints, so that nothing more need be said on this point, but in branding our "errors of interpretation" Mr. Davies has himself been guilty of inaccuracies. He draws attention to "*aska* (sing. *suka*) for *shuqaq* (sing. *shuqqi*) the ordinary word for tent" and to "she-camels called *bakra* for *bakra* meaning a virgin she-camel". We believe that the first word should be *suqqa*, pl. *asqaq*. In our original notes we wrote *asqa* (*q*) as we heard it pronounced, the final *q* being scarcely audible, and it seems to us highly probable that *asqa* (*q*) is a dialectical form of the plural. As to the meaning of the word, it cannot be the "ordinary" word for tent, as neither Badger, Salmoné, Spero nor Amery give it under "tent". On the other hand the interpretation we have given, i.e. a length of fabric, is borne out by the fact that a noun derived from the same root, *sqq* (سق) "divided", is given by Salmoné meaning a roll of cloth. Whether *suqqa* is also used to mean a tent among the Kababish we cannot say, but it is quite definite that four lengths of fabric called *suqqa* and woven of camels hair are used to make the tent by the Kababish. With regard to *bakra* we write (V. A. p. 121) "Theoretically the blood fine should consist of 100 she-camels called *bakra*".

We would point out to Mr. Davies that a "virgin" camel is still a "she-camel". A more careful perusal of the article might have indicated that in writing "she-camel called *bakra*" we were not making an inaccurate statement nor ignorantly confusing *bakra* with *naqah*, (we were indeed perfectly aware that *bakra* signifies virgin she-camel), but stating precisely the kind of camel to be paid; Salmoné translates *bakra* as "young camel", but by analogy with the use of the word for a virgin, it is clear that virgin camels are indicated. For greater clarity the passage might read "she-camels of the kind called *bakra*".

We are grateful to Mr. Davies for supplying a form of song we failed to discover as well as the games, these should we suggest be published. He might also supply an account of the tomb shrine of Abu Goreiba. We cannot agree that we failed to understand the nature of an oath, nor do we consider that he is well advised when he says that "A tomb is potent not because of the holiness of its occupant but because it has been known in fact to kill or injure one or more perjurers in the past". This is only part of the story, the killing or injury of a perjurer is in fact believed to be due to the spiritual virtue of holiness (*baraka*) of the man buried within it which when offended causes the perjurer to suffer, or in the opposite event the pious devotee to be rewarded.

We regret having taken up so much space in our reply; we believe we have touched on the more important misconceptions in Mr. Davies' criticism, though it must not be assumed that we necessarily agree with those of his statements to which we have not specifically referred.

C. G. SELIGMAN

BRENDA SELIGMAN.

Mr. Davies is now on the western frontier of Darfur, a distance of over a month from rail head: we have therefore decided to print the above letter just as we have received it without waiting for Mr. Davies' remarks.

[Ed.]

The Azande.

DEAR SIR,

In your note on p. 303 of October number you mention the name Lemlem etc. as found on Arabic maps. At what date does this first appear? The question is of particular interest.

The present Azande language shews a very distinct substratum of Bantu. Other language study suggests a strong possibility that there was a Bantu language spoken in this area, very possibly the language of Ptolemy's Agisymba. It should be noted that Ptolemy places these people near a number of mountain peaks and a mountainous district, presumably the Nile Congo watershed. Further south of the Azande district, in 16° S. where he is supposed to locate them would be a land of many streams and rivers.

When the Agisymba kingdom broke up, one branch it seems to me went Eastwards and eventuated as the Ba-Huma: another branch went southwards and appear as the Suto peoples. Was the cause of this migration the incursion of that cannibal race to which your note and that on p. 302 refers? and secondly is that cannibal race to be identified with the 'wa-zimba' wave reported by the Portuguese as sweeping up the East Coast from Tete to Mombasa.

The word *cam*, eat is the normal Nilotic word for Eat. It is deduced from the palatalised form of Lyam; the true palatalisation to *diam*, *jam* does not seem to occur. The word Lyam is seen in Bantu *lya*, eat; *nyama*, meat; and *nyama*, wild beast.

Yours faithfully,

W. A. CRABTREE.

Feb. 18th, 1921.

The form Lem-lem is given in Lady Lugard's 'A Tropical dependency' apparently on the authority of the Arab geographer El Bakri.

[Ed.]

The Nubian and Bari Languages.

DEAR SIR,

I have been more than usually interested in the paper on the similarity of Nubian to Bari, because Nubian was one of those languages which it seemed hopeless to include in comparative studies

in the present state of our knowledge. As it is highly desirable to coordinate our African studies on some definite plan and as this cannot be done by the publication of a periodical devoted to African philology, I should like to point out that the study of an African language can now be taken as one of the subjects for the Modern Language Tripos at Cambridge. Swahili is being taught and lectures given on broad general grounds concerning African languages. I should however be glad to form a class for the more definite study of the elements of comparative African philology.

The easiest approach is probably through Bantu. A preliminary outline of Bantu phonetics has been mapped out and I am now working on the study of primitive words, more especially Bantu. This study leads me to think that the elemental forms of the so-called Sudan division as found in the Luo-Shuli-Shilluk group, may be of the same age as the Bantu forms and only variants of them. Certain it is that some words such as *cam*, eat; *dondo*, all; *tong*, spear; *lep*, tongue; may be traced to the same primitive roots and differ very slightly from the corresponding Bantu words. This line of study is worth following out.

Hamitic forms came later and are of at least three types. Indeed Hamitic shews a peculiar facility for blending with other forms. Ful-de is an elemental type in which the Bantu prefix appears as a suffix, the prefix scheme greatly modified and giving way to gender. Nandi presents another type and Masai yet a third. The unique distinction shewn by this Masai type, by which L is characteristic of the masculine gender, and N of the feminine gender, has been a puzzle ever since I first became acquainted with it twenty five years ago; but I think now it is possible to say that Ol, the masculine prefix, is a demonstrative word (Heb. *hal* whence Hebrew Arabic article) akin to the suffix ending — os, — as in Latin and Greek, also Masculine En, the feminine prefix is probably Na, companion (in Bantu, and sometimes, as in Ganda, a feminine prefix) allied to Sum. *tam*, companion, whence came Semitic feminine ending — at, — ah. (Ball, Shumer and Shem p. 28). Closely akin to these forms Na, and Ta or at, is the Latin and Greek feminine ending in a.

Yours faithfully,

W. A. CRABTREE.

Feb. 18th, 1921.

SUDAN NOTES AND RECORDS

Volume IV.

No. 2.

HISTORICAL INSCRIPTIONS FROM GEBEL BARKAL.

BY DR. A. REISNER.

In 1862, an Egyptian officer stationed at Merowe reported to the Egyptian Department of Antiquities that he had found five large stelae of granite in the ruins of Gebel Barkal. Mariette, the great French archeologist, was at that time head of the department, and he arranged the transport of the stelae to the Cairo Museum. They proved to be five in number, and it was possible to connect them with two other stelae and a fragment which had previously been brought away from Dongola Province, but without any details of the exact place of finding. Prof. Schaefer, to whose scholarship we owe a scientific examination of the language of the inscriptions on the stelae and a reliable publication of the texts, was of the opinion that all the stelae came originally from the great temple of Amon at Barkal (our B 500), and in this I concur. The chronological order of the stelae as arranged by Prof. Schaefer is correct (except for possibility of error in the nameless pieces, No. 3 and No. 6) and is as follows:—

NAME.	DATE.	SUBJECT MATTER.	NOW IN.
1. Piankhy	His 21st year. (ca. 720 B. C.)	Conquest of Lower Egypt.	Cairo Museum.
2. Tanutaman.	His 1st year. (ca. 663 B. C.)	Fulfilment of his dream of sovereignty over Egypt.	Cairo Museum.
3. —	—	Fragment of an account of military operations.	Berlin Museum.
4. Aspalta	His 1st year. (ca. 575 B. C.)	Account of his selection and coronation.	Cairo Museum.
5. Aspalta	His 3rd year. (ca. 573 B. C.)	Record of the adoption of his daughter to be High-priestess of Amon at Barkal.	Louvre Museum.
6. (Name erased).	His 2nd year.	Record of the punishment of priests for a crime.	Cairo Museum.
7. Harsiyotef.	His 35th year. (ca. 325 B. C.)	Coronation and annals of wars and buildings.	Cairo Museum.
8. Nastasan.	His 8th year. (ca. 300 B. C.)	Coronation, buildings, wars.	Berlin Museum.

The inscriptions on these stelae form the mainstay of our knowledge of the conditions prevailing during the Ethiopian monarchy (720—250 B. C.). Unfortunately no record has been preserved of the place and manner of their discovery. Probably none was ever made. Oral tradition at Gebel Barkal is conflicting. In 1906, when Mr. Crowfoot made the inquiries reported by Prof. Breasted, forty-four years had passed, and in 1919, when I made inquiries, fifty-seven years. "An aged native" told Mr. Crowfoot that the stelae were found against the front of the "north" half of the Second Pylon of the Great Temple of Amon; but our excavations have proved that statement to be an impossibility. A man reputed to be ninety years old, who claimed to have been present in 1862, indicated to me the disturbed area "north" of the great temple, and this agrees entirely with the conditions revealed by our excavations. In any case, the stones were not in their original places, but in a *cache* similar to the two deposits of statues found by us.

It was a perversity of chance that the discovery of these five important historical documents of an unknown age should have fallen to the casual work of an untrained man. As a consequence, no record has been preserved. Hanbury and Waddington, Cail-liaud, Lepsius and Hoskins, had all made surveys at Gebel Barkal

and had not seen these stelae. During the twenty years after the last of these travellers had passed, the local inhabitants must have continued the taking of *merôg* (fertilizer) and building-stone from the ruins, and the futile search for treasure. As a result of this constant digging, one or more of the stelae may have become partially exposed, and thus have caught the eye of the Egyptian officer visiting the ruins. Apparently his excavations consisted only in disengaging these stelae from the debris. The stelae had no doubt been set up originally on the empty stone bases which we found in the outer court of columns of the great temple. The other two stones, No. 5 and No. 8, may have been removed from the same group before the officer saw it, or they may have been exposed at some distance. We shall never know what other valuable inscriptions have been found in this way and carried off to serve as bread-mortars, roofing stones for graves, or other transient human usage. The fragment in Berlin, No. 3 above, must have come from a stela which was so destroyed. The great Piankhy stela itself has a large piece missing from the upper left side, of which we found several fragments during our excavations.

Now after three seasons of hard work, the Harvard-Boston Expedition has finally cleared the whole of the great temple of Amon,—the front, two great courts of columns, a hall of columns, and the sanctuaries, making twenty-one rooms in all. We have found six stelae,—one more than the Egyptian officer found by chance on the surface; but the new stelae are of a very different character, and cover a range of fifteen hundred years, instead of the four hundred years of the first group. The list arranged in chronological order is as follows:

NAME.	DATE.	SUBJECT MATTER.
9. Thothmes III.	His 47th year. (1454 B. C.)	General description of the king's victories and power, made for the instruction of the people of Barkal.
10. Sety I.	His 11th year. (1303 B. C.)	Restoration of the temple, and reendowment of offerings.
11. Piankhy	Undated. (ca. 720 B. C.)	Glorification of Amon of Napata and Amon of Thebes.
12. Piankhy-khariuwt.	Son of Aspalta. (ca. 570 B. C.)	A private stela of funerary character. The prince was governor of Kanad.
13. Sakhmakh.	Queen of Nastasan. (ca. 300 B. C.)	A funerary stela.
14. Tinyizmeni.	Ca. 100 A. D.	A stela with a long inscription in the Meroitic character, the contents of which are hidden by our ignorance of that language.

To these may be added what is apparently a bilingual inscription, found in the doorway which passes through the second pylon. On the left as one goes in is a fragmentary Egyptian inscription cut in the rock, and on the right is a rather better preserved Meroitic inscription incised on plaster.

From Thothmes III to Tinyizmeni, between seventy and eighty rulers of Ethiopia may have had occasion to set up stelae at Barkal, and some of them must have set up several stelae. Three stones of Aspalta alone were found, and two of Piankhy. In addition to the fourteen stones enumerated, we have found fragments of at least three others,—one (No. 15) hieroglyphic, and two (No. 16 and No. 17) Meroitic,—making a total of seventeen (or eighteen). I consider it probable that there were about one hundred and fifty stelae set up in this temple during the period in question; and while the number of the recovered stones may seem a small proportion, it must be acknowledged to be as large as could be expected in a temple which had repeatedly fallen into decay and been rebuilt during a period of fifteen centuries, and had then for another twenty centuries been exposed to the destroying agencies of time and a population sunk to a half savage state.

The stelae do not, of course, contain the sole historical information found in the great temple. The unravelling of the architectural history of the building, its beginnings, the various additions and restorations, as far as they can be dated, serve also to illuminate the history of Ethiopia, of which it was the religious focus. The walls of the different periods, although woefully defaced, still bear remains of the reliefs and inscriptions, and a series of statues almost equal in number to the stelae have also been found to aid our knowledge of the history of Ethiopian art. The statues found in 1919 have been reported in this journal, and in the *Bulletin of the Museum of Fine Arts* (Boston). Those and the other known statues from Napata represent the kings (19) Tirhaqa, (20, 21) Tanutaman, (22) Atlanersa, (23, 24, 25) Senkamanseken, (27) Anlaman, (28) Aspalta, and (29) Amtalqa, who reigned in succession from 688 B. C. to about 500 B. C., and the queen (26) Amanmalenra. In addition to these, six granite sphinxes (30—35) made by Amenophis III, stood in front of the first pylon, of which four are still on their pedestals, and four other sphinxes (36—39) in front of the second pylon, of which only one remains. Two smaller sphinxes (40, 41) made by Amenophis III, and usurped by the Meroitic king Asru-meraman, were found outside the temple and taken to the British Museum, but it is uncertain whether they belonged to the great temple, or to some other. The great granite altar (42) of the temple is still in place and bears the name of Tirhaqa, while a massive throne basis (43) in the next room was dedicated by Piankhy.

During the last two seasons, 1919—1920, the following pieces have been discovered.

NAME.	DATE.	DESCRIPTION.
44. Hepzefa.	Ca. 2000 B. C.	Seated life-size statue of the first known Governor-General of the Sudan, Hepzefa, prince of Assiut :—upper half missing. Brought probably from the end of the province.
45. Thothmes III.	1501—1448 B. C.	Seated statuette of the king in fine black granite :—upper half missing. Name of Amon erased by Akhenaten.
46. Amenophis III.	1411—1375 B. C.	Figure of the hawk-headed god of el-Kab in fine black granite :—nearly complete. Dedicated to Amon of Soleb, and perhaps brought from the temple of Soleb.
47. Amenophis III.	1411—1375 B. C.	Figure of a great uraeus of same material, dedication and origin as No. 46 :—head and upper part of hood missing.
48. Atlanersa.	653—643 B. C.	Small grey granite altar inscribed on front face only.
49. Senkaman-seken.	643—623 B. C.	Small sphinx in grey granite, the head of which is a portrait of the king :—only slightly damaged.
50. Akrotan.	Ca. 319—300 B.C.	Headless standing statuette (half life-size) of the king, in amorphous bluish slate.
51. (No Name.)	Meroitic.	Small sphinx with king's head, in black stone (basalt ?) :—broken, but complete, and fragments of another.

In the debris of the back rooms of the temple and of the space beside the temple on the "north", various fragments of private statuettes have also been found, which give us the following :

NAME.	DATE.	DESCRIPTION.
52. Merymes, Viceroy.	Amenophis III.	Seated statuette in fine black granite; viceroy of Ethiopia.
53. Thothmes, Viceroy.	Amenophis IV = Akhenaten.	Standing statuette in diorite; viceroy of Ethiopia.
54. Haqaemiasen.	Thothmes IV.	Seated statuette in black granite; overseer of courts (?) in Ethiopia.
55. Bekenwer.	Rameses IX.	Seated statuette in black granite; royal steward in Ethiopia.

The first and most serious question to be decided before the historical material presented by these fifty-five monuments can be correctly utilized is this: Which of these pieces were made for the temple at Barkal, and which were brought here from other temples to adorn the religious center of Ethiopia? All of them, of course, once stood complete in the Barkal temple, and their broken condition is due to acts which took place in that temple. It is inconceivable that broken statues should have been moved from one temple to another, or removed at all from their place of origin, except to be discarded or used as stone. The form and treatment of these fragments show that they were not used as stone either for household or building purposes. The inscriptions on most of them, including the Thothmes III and Sety I stelae, show that they were made for Barkal. The inscriptions on the two sphinxes of Amenophis III (Nos. 40, 41, now in London), and those on the two statues of divinities (Nos. 46, 47), also by Amenophis III, indicate that these four pieces were made for the temple at Soleb. The sphinxes of Amenophis III in front of the first and second pylons are not in their original positions. The rams were made, some lying on the left haunch and some on the right, and must originally have been arranged symmetrically, with all those in the same attitude parallel to each other along the same side of the sacred road, and the others opposite. But at Barkal these sphinxes were set up quite irregularly, with right and left sphinxes mixed on each side of the road. Thus there remain only the statue of Hepzefa and the statuettes of Thothmes III and the viceroys, about which a doubt arises as to their original position. It is further to be noted that all the pieces which were certainly brought from a distance came from one place,—the temple of Amenophis III at Soleb. As far as the preserved records contain any information, Napata is not mentioned before the time of Amenophis II, who hung a Syrian chief on the walls of Napata as a warning to the Ethiopians. Our excavations have failed, up to the present time, to discover any temple at Barkal earlier than Thothmes IV, the successor of Amenophis II, but the stela of Thothmes III is clear proof that there must have been some temple there in his time. It is therefore possible that the statuettes of Thothmes III, the viceroys Merymes and Thothmes, and the steward Bekenwer, were all placed originally in this temple. The statuette

of Thothmes III, if it was brought from Soleb, could only have been intrusive in that temple which was built by Amenophis III, who lived a century after Thothmes III. The temple of Soleb was without doubt the greatest temple in Ethiopia during the XVIIIth Dynasty; but after the time of Sety I, the Barkal temple was an important temple. Thus the decision as to the original places of the minor statuettes becomes extremely difficult, and is a matter of personal opinion. The statue of Hepzefa could not originally have been either at Soleb or at Barkal, as no evidence exists that either place was the site of buildings in the Middle Empire. The known Middle Empire sites are Kerma, where we found the tomb of Hepzefa and statues of himself and his wife, and the Island of Argo, where the Governor, now Sir Herbert Jackson, found an offering stone of Sesostris I.

It is to be noted that Piankhy built both the great courts of columns which lie behind the first and second pylons respectively. The second pylon was for a time the front of the building, and during this time the four inner sphinxes must have been set up. When the addition was made by Piankhy, six more sphinxes were set up in front of the first pylon. It is thus clear that these sphinxes were brought from Soleb by Piankhy; and it becomes probable that the other pieces of sculpture bearing the name of Amenophis III were also brought to Barkal by Piankhy. Although statues have been found of all the kings of Ethiopia from Tirhaqa to Amtalqa, no figure of Piankhy, Shabaka, or Shabataka, has been discovered in Ethiopia; and the other monuments of these kings in hard stone, like the temple walls, bear only inscriptions and reliefs. Apparently Piankhy and his two successors had at their command no sculptors who worked in the round, and Piankhy was forced to bring the sculptured monuments for his great temple from Soleb. At the same time, there may have been some intention on his part to increase the prestige of the one temple and diminish that of the other. Under these circumstances it is possible that Piankhy may have had the statue of Hepzefa brought from Kerma or Argo, and the statuettes of Thothmes III and the officials partly from Soleb and partly from other sites. It must remain unclear whether Asumeraman brought the two small sphinxes, now in London, from Soleb or found them already at Barkal.

The most important monument which the Harvard-Boston Expe-

dition found at Barkal is the stela of Thothmes III. It is 173 cm. high, and 97 cm. wide, made of a stone which appears to be the familiar grey granite of the Nuri stelae and the Bellal quarry. At the top is the usual scene in fine sunk relief, with vertical lines of inscription, and below these are fifty horizontal lines of inscription. The lower right corner has been knocked off, and is missing; the edges are worn as if by handling; and the surface has decayed in a few small places.

Above the scene at the top is a winged sun's disc with uraei and the name of the god, Horus of Edfu. A vertical line of inscription runs down the middle of the field, on each side of which was a standing figure of Amon facing out and holding a staff in one hand. On each side of this is a figure of the king standing, facing Amon, and holding out a small vase in each hand. The king wears the royal apron with tail behind, and the so-called war-crown. The figures of Amon have been erased, as well as every mention of his name, both in the scene and in the text below. These erasures date, of course, from the reign of Amenophis IV (Akhenaten), who attempted as a political measure to suppress the Amon priesthood and its cult.

The inscriptions in the scene are without special interest. On the right Amon says to the king: "I have given to you the kingship and the overlordship of the people." Above the king are two of his five names: "The Good God, Men-kheper-ra; the Son of Ra, Thothmes-heqa-Waset (=ruler in Thebes), endowed with life like Ra forever." Before the king are the words: "The giving of libation. He makes (thereby) that he be given life." Behind the king is the usual magical formula: "All protection of life, endurance, and prosperity, be behind him like Ra forever." Still further to the right is a vertical line which says: "He is the foremost of all living souls, having appeared as king of Upper and Lower Egypt on the throne of Horus like Ra." On the left the inscriptions are of similar import. Amon has given to the king "all lands and all foreign lands;" the king is offering "wine" instead of water; and the vertical line states that "He is the foremost of all living souls, the Lord of the Two Crowns, the king of Upper and Lower Egypt, of the North and the South, like Ra."

The main inscription of fifty lines has, however, considerable interest. The first line begins:

"In the year 47, the third month of the overflow-season, the tenth day, under the Majesty of
 "the Horus *Ka-nekht-kha-em-waset* (= Strong-bull-appearing-in-Thebes),
 "the Lord of the Two Crowns *Wuah-nesuwt* (= Established-in-kingship),
 "the Horus conqueror of Set *Zeser-khaw-sekhem-pekti* (= Splendid-of-coronation-mighty-of-power),
 "the king of Upper and Lower Egypt *Men-kheper-ra* (= Enduring-in-existence-is-Ra).
 "the beloved son of Ra, of his body, Lord of all foreign lands *Thothmes-nefer-kheperuw* (= Thothmes-beautiful-of-existence),
 "He made (it) as his monument for his father Amon-ra (erased) lord of *Nesuwt-tauwy* (= the Amon-temple), in the fortress *Sema-khasuwt* (= Slaughter-of-the-foreign-lands). That which he made was an eternal hall of triumph, because He (the god) had made great the victories of My Majesty more than any king."

It is clear that Thothmes III records on this stone the construction of a type of religious building called a *khenuw* (which I have translated "hall of triumph") for Amon-ra in the fortress *Sema-khasuwt*. In line 33 the purpose of the inscription is given more explicitly. The beginning of the line is lost, but appears to have been "spoken by My Majesty," or "My Majesty says to you." It continues:

"Listen, O ye people of *Ta-khent* (= Southern Ethiopia) which is in the Holy Mountain called *Nesuwt-tauwy* among a people which is not known. May ye learn the wonders of Amon-ra (erased) before all the Two Lands."

Now the "Holy Mountain" is the ancient name of Gebel Barkal, while "Nesuwt-tauwy" is the name of the great temple of Amon both there and at Thebes. Thus the fortress of Sema-Khasuwt is at Napata in the same way that the forts, *Sekhemkhakanwra* and *Itennuwpeduwt* were at Heh or Semneh.

The main part of the text is not a chronological account of the reign of Thothmes III, but a laudatory summary of his great acts, parts of which are given in poetic form. In line 8 begins a reference to his campaign in Mesopotamia (Naharein); the eighth campaign, carried out in his thirty-third year:

"A king is he, powerful like the god of war;
 "What he seizes is not taken from him;
 "One who tramples all foreign lands,
 "And they found no protection in the land of Naharein;
 "Its (Naharein's) lord fled in fear of me;
 "I tore down his cities and villages;
 "I burned them with fire;
 "My Majesty made them as places which had never been founded;
 "I made all their people my booty as living captives,
 "And the herds thereof without number, and their goods likewise.
 "I took from them the food;
 "I harvested their barley;
 "I cut down their fruit trees, all their wild trees.
 "Their wells were of blood;
 "My Majesty destroyed it;
 "It became a plantation of leafless trees."

Then, lapsing into prose:

"Now I journeyed to the lowlands of Asia, and had many freight boats of cedar built in the highlands of the God's Land, in the district of Ta-nebt-seni(?). (I had them) set on carts, and oxen drew them, proceeding to the place where My Majesty was, in order to ferry across the great river which flows between this land and Naharein (i.e., the Euphrates). The king (of Egypt) however challenged (?) the enemy, ... the enemy, (and) crossed the Euphrates after reaching it with the best of his army and sought the miserable enemy (fallen one) in the lands of Meten. Now he (the king of Naharein) fled before My Majesty to another land, a far place, because of fear. Then My Majesty set up a memorial stone upon that mountain of Naharein, quarried in the mountain on the western side of the Euphrates.

"I have no enemy in the Southern Lands;
 "The Northerners come bowing because of my glory (bauw).
 "Ra it was who commanded this for me;
 "I have seized all that his light surrounds;
 "He has given me the earth in its length and breadth;
 "I have gathered together the Nine Bows, the Islands in the Midst of the Sea, the Hauw-nebuw (Greeks), the rebellious foreign lands.

"They hasten southwards to Egypt.

"I set my sword in Naharein ;

"Great was the terror in the mouth of the Sand-dwellers (Bedawin);

"They closed their gates because of it ;

"They did not come forth outside because of fear."

In line 16, there is a mention of the elephant hunt in Niy, hitherto known only from the inscription of the official Amenemheb :

"Another time of victory which Ra commanded for me, he repeated for me a mighty deed in the swamps (?) of Niy. He caused My Majesty to hunt elephants, and My Majesty fought with them as a herd of 120. Never was the like done by any king since the primæval gods received the white crown. I say these things without boasting, without lying."

In line 19, the famous siege of Megiddo is related, but with some new details :

"He (Ra) commanded to me the lands of Retennuw in my first campaign. They came to fight with My Majesty with the chosen men of all foreign lands, standing on their horses, as 330 chiefs every one with his army. Now they were in the valley of Qina, formed with a narrow mouth. Good fortune came to me among them. I charged them and they fled at once, (leaving) their fallen ones as corpses, and they entered Megiddo. My Majesty besieged it seven whole months. They did not come forth outside, but were beseeching My Majesty, saying,—'Give to us thy breath, 'O our lord. Never again will the foreigners of Retennuw rebel 'against thee.' Then that fallen one, together with the chiefs who were with him, caused to come forth to My Majesty their children, all of them, bearing many gifts of gold and silver, all their horses which drew their chariots of gold and silver, together with their painted chariots, all their battle shields, their bows, their arrows, all their weapons. These it was wherewith they came to fight My Majesty. Then they brought them as gifts to My Majesty. Meanwhile, they stood on the walls and besought My Majesty. Quickly the breath of life was given to them. Then My Majesty caused them to be fed from the time when they said.—

'Never will we repeat evil against Menkheperra (Thothmes III), may he live forever, as long as we live because we have seen his glory (*bauw*) and he shall give to us breath as he wishes. Ra [has given him victory?], not the power of man.' Then My Majesty caused them to take the road to their cities. They went all of them upon donkeys, for I had taken their horses. I carried off the citizens there to Egypt, and their property likewise. Ra gave them to me, [not the power of man?]. An excellent god [is he?], fortunate in occasions, whose plans do not fail, who despatched My Majesty to seize all foreign lands together, and I overthrew them as he commands to him (who is) on the road of his creator. No one approached him in me. My [whip?] overthrew the Bedawin; my staff smote the Nine Bows. My Majesty has bound all the earth. Retennuw is under my sandals; the Ethiopians are the property of My Majesty. They serve me as one man, taxed with annual dues of millions of things, the gold of the Southland (*wepet-ta*), the abundant gold of Wawat uncounted. There is built there for the Court, may it be living, prosperous, and well, every year galleys, and many freight boats with their crews, in addition to the abundant tribute of the southerners (?) of ivory and ebony."

The additional facts in regard to the first campaign of Thothmes III are :

- (a) The league against Egypt consisted of 330 chiefs.
- (b) The siege lasted seven months,—that is, until the 24th year, the 4th month, the 16th day. Thus the second campaign probably started from Megiddo and consisted simply in the collection of tribute from the tribes which submitted at Megiddo or as a result of the fall of Megiddo.
- (c) The chiefs rode off on donkeys, because the king had taken their horses (and chariots).
- (d) The surrender of the town was accepted, and the besieged spared, on the promise never to rebel again.

The eighth campaign receives further enlightenment by the statements in regard to :

- (e) The building of boats for the crossing of the Euphrates and their transport on carts to that river.
- (f) The elephant hunt in the swamps (?) of Niy, in which the king fought a herd of 120 elephants.

The conditions in the Sudan are enlightened by the specific statement that:

- (g) Galleys (?) and freight boats were built in Kash to transport the tribute to Egypt.

Perhaps the most interesting passage is that which follows the address to the people of the Holy Mountain mentioned above, but it is unfortunately incomplete owing to the loss of the lower right corner of the stela:

"May ye know the wonders of Amon-Ra (erased) before all the Two Lands.

"... .. the guards (?) were about to approach in the night to do the regulation watch. It was the second hour, and the morning-star (?) came when the comes. The like had never happened. He placed himself opposite it. Not one among [them?] stood ...

"... .. as corpses. Then [he looked] after them when the light was on their faces. Not one among them found his hand, nor did he guide their horses left to wander as [beasts of the] desert.

"... .. in order that all foreigners might see the glory of My Majesty. I hastened going southwards; my heart was joyful and I celebrated the festival of my Lord, Amon-Ra, lord of Nesuwt-tauwy, the one who commanded this victory, giving terror

"... .. in my time. He gave fear of me in all foreigners; they fled from me on the road on which Shuw shines and were bound under the feet of My Majesty. My Majesty, myself, says:

"... .. I am mighty; I am wise; great in guarding the conquest which my splendid father Amon-Ra (erased) lord of Nesuwt-tauwy gave to me. He made me lord of the five portions, ruler of all the sun's disc goes around; victorious"

It appears that some sort of astronomical miracle was seen, probably by the king in a dream.

The broken sandstone stela of Sety I is dated in the year 11, third (?) month of the third season, day 11 (? or 12). The mutilated main text is a building inscription, of which the last two lines:

"... may all your hearts be joyful the foremost of Nesuwt-tauwy. The son of Ra Sety-merenptah, he has built for you a new house of good [white] enduring stone. He has doubled for you the divine offerings. He has given increase over what was before. May ye give to him all life before ye, all health before ye, like Ra forever."

This stone had been re-used whole as a paving slab in the floor of the third hall of columns (B 503), and appeared to have stood on a stone pedestal just at the doorway of a small chapel built of small stones (like masonry of Ramesses II and earlier). It is therefore probable that this chapel represented the renewal (or part of it) which was carried out by Sety I.

The sandstone stela of Piankhy has unfortunately lost the greater part of the text on the lower portion of the stone by weather erosion. The two cartouche names had been carefully erased, and also the figure of the king, but the name of Amon had not been erased. In the field above, the figure of the king had been restored and the single cartouche name "Piankhy" written in careless characters above. The other three names of the king given in the text below are similar to those of Thothmes III, except that the Horus-name is "Strong-bull-appearing-in-Napata (not in Thebes). Piankhy had evidently made his names as a copy of those of Thothmes III. In the middle of the upper field of the stela, the ram-headed Amon-Ra, lord of Nesuwt-tauwy, seated, holds out two crowns to the king,—in the right hand, the war-crown, and in the left, the crown of Lower Egypt; above is an inscription in vertical lines, as follows:

"Spoken by Amon-Ra, lord of Nesuwt-tauwy (the Barkal Temple?), a pure greeting before his beloved son, [Pi] ankhy. I said concerning thee when thou wert in the body of thy mother, (that) thou shalt be ruler of Egypt (Qemt). I knew thee in the seed, when thou wert in the egg, (that) thou wert to be lord," etc.

Facing these lines, the king's inscription says :

"He says,—Amon of Napata has given to me to be ruler of every land. The one whom thou sayest to him, 'Thou art king,' he becomes king; and the one thou sayest to him, 'Thou art not king,' he becomes not king. Amon in Thebes has given to me Egypt (Qemt). The one thou sayest to him, ['Thou shalt be crowned,' he shall be crowned]; (but) the one thou sayest to him, 'Thou shalt not be crowned,' he is not crowned."

It is of interest to note that on the famous granite stela of Piankhy describing the conquest of Egypt, the figure of the king and his name have been erased in the upper field and again restored, as in our stela. The granite stela is dated in the year 21, so that this mutilation and restoration must both have taken place after that time, probably after the end of the reign in the course of some dispute about the succession. Without any evidence I imagine the erasures to be due to Tanutaman, and the restoration to Atlanersa or Senkamanseken. The names of Aspalta have also been erased on his coronation stela only, not on the two other stelae set up by him, but no attempt has been made to restore them. Likewise the names of the unknown king of the "Excommunication Stela" have been erased, but that was probably a revenge by priestly enemies, and not an attempt to destroy evidence bearing on the succession.

There is no year date in the new Aspalta stela found by us. The text is of a funerary character for the benefit of Aspalta's son, Piankhy-khariuwt, called Khariuwt for short, who was nomarch of a district called Kaned (or Kanda?). Lines 4-7 give a version of the negative confession from Chap. 125 of the Book of the Dead, and continues line 8 :

"I gave bread to the hungry, water to the thirsty, clothing to the naked; I did these things on earth, being in the path of the gods, and I was far from those thing which they abominate; a good example for the children after me, forever and ever."

After prayers for Aspalta and his mother Nansalsa, both "living," the text continues in line 20 :

"You shall know these things which the son of Ra, Aspalta, did for me: he built for me a pyramid of good white stone of the living rock; he provisioned for me a chapel of millions of years with every good thing; he made my name to grow therein; he made many the offerings of gold and silver; he gave me meat offerings;" etc.

Where is this pyramid of Piankhy-khariwt? It was neither at Nuri nor at el-Kur'uw. At Barkal, none of the thirty or more pyramids excavated or examined was earlier than the Meroitic Period. On the Southern Hill at Meroe (Begarawiyah), however, there is a cemetery of tombs ranging in date from the time of Piankhy to that of Amenarkneb (about 250 B. C.). A few of these were identified as the tombs of members of the royal family; one was dated by two inscribed alabaster jars to the reign of Aspalta himself; but many were unidentified. It is possible that the tomb of Piankhy-khariwt is among the unidentified pyramids in this Southern Cemetery at Meroe.

The Meroitic stela found in place before the outer pylon bore the name of a king, Tintizmeni, who appears to be identical with the king buried in the pyramid Begarawiyah N XXVII. Unfortunately the texts of the Meroitic inscriptions are as yet practically sealed books to us. Our hopes rest in Professor Griffith and his continued endeavors to add a knowledge of the language to his decipherment of the writing. At one time, I thought the inscriptions, apparently bilingual (Egyptian and Meroitic) on the sides of the doorway of the second pylon of the Great Temple might serve his purpose; but the Egyptian inscription proved to be too fragmentary. But it is, no doubt, only a question of a few years now before the Meroitic inscriptions from Barkal must also yield their historical information.

The visible temples and buildings of the Ethiopian monarchy at Napata have now been excavated,—the temple of Tirhaqa at Merawe by Professor Griffith, the temples at Barkal by the Harvard-Boston Expedition. Only one remains,—a small rock-cut temple on the "eastern" bank about half way between Barkal and Merawe. At present the chances seem to me small for the recovery of further important material by means of excavations. But no one can tell. Some important document may turn up accidentally at any time,

found built into a modern wall or grave. Possibly even now there may be some important *cache* of stones lying just beyond the limits of our extensive excavations, like the stelae found by the Egyptian officer, and like our two deposits of statues.

G. A. REISNER.

Pyramids P. O., Cairo,
15th June, 1921.



ARABIC PROVERBS, SAYINGS, RIDDLES AND POPULAR BELIEFS.

BY S. HILLELSON.

The bulk of the material presented in this paper is derived from a book entitled *al-'Arabiya fil-Sūdān*, the author of which is Sheikh 'Abdullāhi 'Abd al-Raḥmān al-Amin, a graduate of the Gordon College and a teacher of Arabic under the Sudan Government Education Department. The main portion of the book, which hitherto remains unpublished, is a glossary of the spoken Arabic of this country viewed with special reference to this connection between the modern dialect and the classical language. A short introduction treats of native beliefs, customs, dress, children's games and other features of every-day life, and each fact is accompanied by references to parallels drawn from the classical literature. The author champions the thesis that the modern inhabitants of the Northern Sudan are of pure Arab descent, and one of the objects of the book is to refute the contrary view which would reduce the Arab influence to a comparatively slight infiltration acting on the aboriginal Nubian stock. It must be admitted that on the cultural side the material collected by the Sheikh does not afford convincing evidence for his thesis: some of the correspondences which he quotes are purely linguistic such as would necessarily occur amongst a population which has adopted the Arabic language together with its metaphors, proverbs and ways of thought; other examples, though truly popular in their present form, ultimately go back to literary sources, while not a few seem to belong to the realm of primitive folklore which transcends all boundaries of race and speech. From our point of view therefore the interest of the material does not consist in its evidential value for any theory of origins, but rather in the illustration it affords of the language, mind and humour of the present-day natives of the Sudan, while the classical parallels are perhaps of some interest inasmuch as they show how customs

and forms of speech surviving to the present day may help towards the interpretation of expressions and allusions occurring in the ancient literature.

Sheikh 'Abdullāhi's manuscript was generously placed at the disposal of the present writer who has made somewhat free use of it. The selection of extracts and the arrangement are his own, the wording of the text has not been closely followed and here and there matter derived from other sources has been introduced. . Less stress has been laid on the classical parallels and appropriate subjects have not been excluded on the ground that no corresponding passage from the ancients was available. It has not been possible to verify all the references to classical literature, as the Sheikh does not generally mention his sources, but it appears that he mainly relied on the Qāmūs and al-Maidānī's collection of proverbs. Some of his material is found in a short account of the superstitious ideas and practices of the ancient Arabs by Ḥamza al-Iṣbahānī, who died between A. D. 961 and 971. This text which was not accessible to the Sheikh has been published by E. Mittwoch in the *Mitteilungen* of the Berlin Seminary of Oriental languages (*Westasiatische Studien* Berlin 1912)

Anyone who is familiar with the attitude of the educated native towards the superstitions and the language of the *'amma*, will appreciate the freedom from prejudice which Sheikh 'Abdullāhi has shown in devoting his time to the study of these subjects. The material he has brought together only touches the surface of a vast subject, but it has the merit of being first-hand information, and thus affords a most interesting contribution towards our knowledge of native custom and dialect. It should be added that the author, who is a native of Tuti Island near Khartoum, is also familiar with other parts of the northern Sudan, especially Kordofan, and that where it has been possible to check his statements, these have been found to be accurate in every respect.

Beliefs and Practices.

A black mark made with antimony (*kuhl*) is put on the face of newborn children to protect them against the evil eye until they are forty days old. A note published in this journal (vol. 2 p. 216) shows that this mark may take the form of a cross and Christian influence is suggested in this connection. The practice itself is pre-islamic and

was known to the ancients under the name of tadsim. A ḥadith relates that the caliph 'Othmān on seeing a handsome child exclaimed *يسموا نوتته*, blacken the dimple on his chin: The dictionaries in which this ḥadith is quoted s. v. *يسم* add that this was done to avert the evil eye. It should be noted that this word, though explained as 'blacken' in this context, originally means "to make greasy". It seems clear however that the commentators responsible for the note in the lexicons were familiar with the custom referred to.

A thread or cord is tied round the waist of small boys, and with the Baggāra this practice is not restricted to boys. Amongst the latter, men women and children wear a thread twisted of the bark of a tree which they call *berim*. The word *بريم* occurs in the classical language, where it means a thread or string twisted of white and black yarns or a twisted rope in which there are two colours, which a woman binds upon her waist. The ancient Arabs tied round the waist of boys a thread called *ḥiqāb* *حقاب* the object of which was to ward off the evil eye.

When a child's tooth drops out he takes the tooth together with a grain of dura and a piece of coal ⁽¹⁾ and throws them towards the sun at the time of his rising exclaiming.

yā 'ein el-shams ukhudi (or addeitak) sinn el-ḥumār wa 'ddini sinn el-ghazāl.

Oh eye of the sun take the donkey's tooth and give me a gazelle tooth.

This is not done when the sun looks yellow, because in that case the child would get yellow teeth. The same usage is reported of the ancient Arabs by Ḥamza al-Isbahānī no. 20, and the verse of Ṭarafa b. al-'Abd quoted below alludes to the belief that beautiful white teeth are the gift of the sun.

If a traveller in the desert is overtaken by night and does not know where to find a friendly encampment where he might be received hospitably, he imitates the barking of a dog. The idea is that the dogs of any camp in the vicinity will raise their voices in reply and the traveller will be guided by the sound. This practice which is known to all dwellers of the Bādiya is referred to in a verse of the poetess Laila al-Akhyaliya, who lived in the first century of Islam.

(1) *Other authorities mention three or seven grains of dura and pieces of coal.*

Many of her poems are devoted to the praise of her dead lover Tauba b. al-Humayyir and the verse in question runs as follows :

يا توب للمولى ويا توب للندى ويا توب للمستبح المتور

Oh Tauba, protector of clients. Tauba the generous, Tauba hospitable to the barker who looks for a light.

When a traveller approaches a strange town it is advisable that before entering it he should bray like an ass. This has the effect of protecting him against any epidemic which may be raging in the place. Sheikh 'Abdullāhī remembers that at the age of ten he travelled from Omdurman to Rufā'a on a boat on which there were a number of men and women, and when Rufā'a came in sight he was urged by his fellow-travellers to bray, they themselves setting the example. Hamza al-Isbahānī mentions this superstition (loc. cit. no. 14). According to him the braying should be repeated ten times whence the practice is called ta'shīr. He quotes an anecdote about the poet 'Urwa b. al-Ward, who exhibited a laudable scepticism when entering the town of Khaibar, where plague was raging : refusing to follow the example of his companions he improvised the following verse :

لعمري لئن نهقت من خشية الردى نهقت الحمير إني لجروء
فلا وأنت تلك النفوس ولا أنت على روضة الأجداد وهي جميع

'By my life, if I were to bray like an ass from fear of death then would I indeed be a coward.

These lives will not escape, nor will they reach Raudat al-Ajdad with numbers undiminished.'

After accomplishing their business at Khaibar they turned homewards, but before they had reached Raudat al-Ajdad all of them were dead with the exception of 'Urwa.

A man stung by a scorpion or bitten by a snake is decked out in women's ornaments and prevented from going to sleep, the idea being that during sleep the body would offer less resistance to the poison. Games and dances and music are arranged in order to keep him awake. According to Hamza al-Isbahānī (no. 25) he must wear the ornaments seven days. The patient is euphemistically called 'salīm'. The poet al-Nābigha alludes to this in the following verse

يسعد من ليل التام سلبها لحي النساء في يديه قعاقع

'The salīm is kept awake the live-long night while the ornaments of women are jingling on his hands.'

The women of the Sudan apply antimony to their gums and lower lips which are first pricked with needles; the antimony is then applied to the wounds and marks are produced which resemble tattoo marks. This is called dagg el-laghab wal-shallūfa (laghab=gums), and it is practised by all tribes with the exception of the camelowning nomads of Kordofan like the Kabābīsh, the Kawāhla and the Shenābla. Certain tribes on the Blue Nile — the Ḥamada, Juhaina and Shambāta and the Ḍabbāina of the Atbara — have especially elaborate methods and the Baggāra are famed for their skill in the art. References to a similar practice are frequent in the ancient poets. According to Lane, s. v. *التمد*, the women of the Arabs used to sprinkle antimony upon the lips and gums in order that the teeth might glisten the more, and for the same purpose many tattooed their lips so as to make them of a uniform dull bluish colour. The poet Tarafa b. al-'Abd says in his Mu'allāqa describing the fore teeth (نفر) of his beloved

سَقَنَةُ إِيَادَةِ الشَّمْسِ إِلَّا لِلثَّاهِ أَسْفَ بَلَمْ تَكْدِمِ عَلَيْهِ بِإِثْمِ

'The light of the sun has shed its lustre upon them except that the gums are black although she did not prick them with antimony.'

and a similar passage occurs in a poem by al-Nābigha of Dhubyān

تَجَلَّوْا بِقَادِمِي حَمَامَةٍ أَبْكُرَ بَرْدًا أَسْفَ لِلثَّاهِ بِالْأَثْمِ

'Between lips black as the tip feathers of a dove of the thicket she displays teeth to the gums of which antimony has been applied.'

A Wednesday at the end of a month or the last Wednesday of a month—arbaḥā wa 'ugāb shahr—is regarded as unlucky all over the Sudan, and no one will begin any undertaking or set out on a journey on that day. This belief can be traced to the ancient Arabs who had a proverb *الثقل من أربعا لا تدور* 'more burdensome than a Wednesday which does not come round again', where the phrase 'does not come round again' means that it is not followed by another similar day in the month. The origin of this belief may be found in the fact that it was on such a day that divine punishment descended upon the people of 'Ād, and it lasted until the end of the month. Cp, Qur'an p. 69, verse 5: "and as for 'Ād they perished with the cold blast of wind, which He subjected against them for seven nights and eight days consecutively".

The commentators say that punishment began on the last Wednesday of the month of Šafar⁽¹⁾.

The people of the Sudan likewise attach an evil significance to the month of Šafar which in their dialect is called el-Wiḥeid or Šahr el-ḥarāyig. The latter name (the month of burnings) is due to the belief that during this month the fires of Hell are lit.

Both the ancient Arabs and the modern inhabitants of the Sudan have many stories and sayings in which animals and inanimate objects are introduced as gifted with speech. According to the Sudanese the donkey says 'khamla khamla wa lā meshī fil-ramla; Gently, gently and no walking in the sand'. They relate that the dog originally had no tongue, but stole it from the crocodile by means of trick, therefore when a dog approaches the river they call out 'šid el-lisān jāk. "The owner of the tongue is after you", and the dog runs away. Ḥamza al-Iṣbahānī, no. 1—7, quotes a number of folk-lore stories of the ancient Arabs which are very similar in character.

Proverbs.

A collection of Sudan Arabic proverbs was contributed by Mr. H. C. Jackson to the second volume of this journal (p. 105 ff.). The proverbs given in the following pages do not occur in Mr. Jackson's collection; most of them are taken from Sheikh 'Abdullāhī's book, where they are quoted with the object of illustrating their correspondence with the proverbs of ancient Arabia. A certain number of sayings derived from other sources have been added; these will be known from the rest by the fact that no classical parallel is quoted.

El-latim mā bi'allimō el-bikā. Cl. Ar. لا تعلم اليتيم البكاء

There is no need to teach an orphan how to weep.

(1) I have consulted several commentaries on this passage, and it does not appear that the opinion quoted by the Sheikh was generally held. In the *Commentary of Ibn Ḥayān* (ed. Cairo A. H. 1328, p. 321) it is stated that the punishment occurred during the last days of the month of Shawāl (not Šafar); it began on a Wednesday and it ended on a Wednesday which was the last day of the month. I have heard it stated that it was on a last Wednesday of Šafar that Pharaoh and his hosts were drowned.

El-kelib berid khangō. Cl. Ar. احب اكل الكلب اليه عاتقه

Strangle your dog and he will love you.

Rigaiyig u zādō moiya. Cl. Ar. ثألة مدمت بما

They poured more water on the wet ground.

El-ḡayig 'addat el-dābī ikhāf min majarr el-ḡabil. He who has been stung by a serpent is afraid of a rope dragged along the ground. Cl. Ar. من نهشته الحية حذر الرمن الابلق. He who has been stung by a serpent is on his guard against a streaked camel halter. Cp. the verse of the poet

إن السبع غائف متوجس يخشى ويهرب كل حبل أبلق

'Verily he who has been stung is afraid and on his guard fearing and dreading every streaked rope'.

Kelām el-gisayir mā binsama'. The speech of the short man is not listened to. Cl. Ar. لا يطلع للصير امره. The obvious meaning of the proverb is that a man of insignificant presence is not listened to in the councils of the tribe, but the classical sources relate a story in which the word Qusair is taken as a proper name. According to this tale al-Zabbā, i.e. Zenobia the queen of Tadmor in the Wilderness, desired the blood of Jadhīma b. Malik al-Abrāṣ in vengeance for her father. Hence she invited him to pay her a visit and he was advised by Qusair al-Lakhmi to decline the honour. But disregarding the advice he proceeded to Tadmor to where he was duly slain. Then Qusair made use of these words which became a proverb.

La lai fiho nāga wa lā jemel. Cl. Ar. لا ناقتي في هذا الامر ولا جملي. No camel of mine, male or female, is concerned in this matter. This proverb is used to express the attitude of a Gallio, or the selfish neutrality of a man who refuses to take sides in a quarrel which does not affect his pocket. The origin of the saying goes back to pre-islamic history. When the war of Basūs broke out between the brother tribes of Bakr and Taghlib a man of Bakr called al-Ḥarith b. 'Abbād used these words to indicate his intention of taking no part in the quarrel. The words gain point from the fact that the ultimate cause of the war was the slaying of a camel belonging to an old woman called Basūs.

El-kheil igalliban wal-shukur lē Hammād. The horses rout the enemy but Hammād gets the praise. The classical proverb quoted by Sheikh 'Abdullāhī in this place does not appear to give a true parallel. It runs جميل من و يقضى لكيز. Shann is made to carry while

Lukaiz is let off, 'and refers to a story according to which a mother travelling with her two sons put the burden of mounting her on one of the sons, while the other was excused the duty; whereupon Shann, the aggrieved one, killed her and excused his deed with these words which passed into a proverb.

Idak rabaṭat wa khashmak nafakh. Cl. Ar. يدالك اوكتا وفوك نشخ.

It was your hand which tied and your mouth which blew. The proverb is said of a man who perishes through his own fault; it was originally applied to a man who was drowned while trying to cross a river by means of an inflated skin which was not securely tied.

El-khalā wa lā el-rafiḡ el-fasil. Cl. Ar. الوحدة خير من جليس السوء

Better to be alone than to associate with bad company.

Ḍarabnī baka sabagnī shaka. Cl. Ar. يشجني ويبيكي

He struck me and wept, then he got his complaint in first.

'Allamnāhum el-shahḍa sabagōna 'ala l-biyūt. We taught them the trade of beggary and they got to the hosedoors before us. This is somewhat reminiscent of the well-known verse ascribed to a pre-islamic poet

أَعَلِمْتُ الرَّمَايَةَ كُلَّ يَوْمٍ وَلَمَّا اشْتَدَّ سَاعِدُهُ رَمَانِي

Every day I taught him skill in archery, and when his arm waxed strong he shot me.

Wadd el-'Arab daulatō (or mulkō) yōm 'irsō wa yōm ṭahūrō. The son of the Arabs is king on the day of his wedding and the day of his circumcision. Cl. Ar. كاد العروس يكون ملكاً

During the festivities of a circumcision and a wedding the hero of the occasion is compared to a king and shown every respect and deference. The friend fulfilling the function of Best Man is called his wazir and the band of young men attending him are compared to a guard of honour. Modern commentators see in the biblical Song of Songs a collection of verses sung at the wedding of a Hebrew peasant, and the references to King Solomon in his glory are interpreted in the light of the Arab or Oriental idea which is expressed in our proverb.

El-khauwāf 'aṣātō ṭawīla. Cl. Ar. عصا الجبان اطول

The coward uses a long stick.

El-timsāḥ ṭirō fī baḥrō galla'. They mentioned the crocodile and behold it appeared in its river. Al-Maidānī relates that 'Abdallah b. Zubair, the Medinite pretender to the caliphate during the Ummaiyad

dynasty, was one day asking for news of al-Mukhtār, the wellknown partisan of the 'Alids, whom he then believed to be at Mecca. But while he was still speaking al-Mukhtār suddenly appeared and 'Abdallah exclaimed in the words of the proverb : *اذكر غائباً يقرب*

Mention an absent one and he draws near.

Zeitun fi baṭun beitun. Their oil is in the recesses of their house, i.e. they keep it for their own use instead of expending it in hospitality. The classical parallel is *سمنكم هريق في اديكم*

Their butter is poured on their own bread. (*مادوم — اديم*) 'seasoned bread'). This proverb is made use of in the following verse in which the people of Baghdad are stigmatised for their niggardly hospitality.

ترحل فما بغداد دار اقامة ولا عند من أسمى بغداد طائل
 محل أناس ممنهم في أديهم وكلهم من حلية المجد عاطل
 ولا غرو أن شلت يد المجد والملا وقل سماح من رجاله وقائل

Depart hence, for Baghdad is not a place to abide in, and he who spends his night there gains no profit.

A place of people whose butter is poured on their own bread and all of them are bereft of the jewels of praise.

No wonder that the hand of praise and nobility withers there, since scarce among them is one who gives and one who receives.

Mā ya'rif el-ḥau min el-lau. He does not know right from wrong or true from false. The precise signification of 'ḥau' and 'lau' is doubtful some interpreting it as 'yes' and 'no' and others as 'urging forward' and 'stopping' a camel. The classical form of this phrase is almost identical with the colloquial version given here.

Raja'at Ḥalima lē-gadīma. Ḥalima has returned to her old ways. This is said for example of a man who has acquired sudden wealth and soon afterwards finds himself poor again, or of a backslider who has promised to mend his ways, but relapses into his old habits.

The classical proverb is *عادت لعترها لميس*

Lamis has returned to her old habits.

Awarrik nujūm el-gāyila Cl. Ar. *لا ريب لك الكواكب ظهرا*

I will show you the stars at midday.

Akkān zōlein galu lak rāsak māfi almis. If two people tell you your head has disappeared, touch to find out.

El-zōl shin dakhal bein el-baṣāla wa girfata shin beshumm bara

'afnata. If a man gets between an onion and its skin what will he smell but its stench?

El-'adū mā bibga ṣalīḥ wal-ḥanḍal mā bibga battikh. An enemy will no more become a friend than colocynth will turn into water-melon.

El-Baṭḥānī shin sallam 'aleik 'idd aṣāba'ik. When a Baṭḥānī has shaken hands with you count your fingers. The point is that the Baṭḥānī are notorious as skilful thieves.

El-moiya mā bitrōb wal-fajira mā bittūb. A harlot will mend her ways when water curdles like milk.

El-tōr shin waga' kataran sakakīn. When the bull is down there are plenty of knives.

Riddles.

The asking of riddles or conundrums is a favourite form of amusement not only confined to children. A number of specimens of this somewhat feeble form of wit, partly derived from Sheikh 'Abdullāhī's book and partly from other sources, have been included in the present paper, though here the question of classical parallels does not arise. The Sudan-Arabic word for a riddle is ḥujwa, pl. ḥijā, and the same word is applied to folk-lore stories or fairy tales. Before asking a riddle an opening formula is used: ḥajeitak mā bajeitak, the answer to which is: kheir Allāh (or kheiran) jān wa jāk. The first word of this formula appears to be a denominative verb derived from ḥujwa while bajeitak is a nonsense word introduced to complete the jingle. The 'an' of kheiran corresponds to the tanwīn of the classical language which the colloquial retains in a certain number of phrases; jān is a shortened form of jāna جانا.

Dakhal el-gashsh mā gal kashsh. It goes into the grass without a rustling sound. The shadow.

Hūwa ṭawīl mā bilḥag el-ka'kōl. It is long but does not reach the piece of gum up on the tree. The road.

Mekkein fī kakar akkān dā ghāb dāk ḥaḍar. Two kings on a throne, when one is absent the other is present. The sun and the moon. Cp. S. N. R. vol. 2 p. 106.

Maṭmūrt Abu Zeid malāna beiḍ. The grain pit of Abu Zeid full of eggs. The mouth and the teeth.

Şōṭ el-melik waga' min beshilo. The king's whip has fallen down, who will pick it up? A snake.

Hajar ḥujanjara ḥujāra lā, Tamshi be arba'āta, el-ḥumāra lā tafgis tebaiyid el-jidāda lā. A stone-like stone but not a stone, it walks on all fours but is not a donkey, it lays eggs and pecks the shell but is not a hen. The crocodile.

Murkab kebīra 'askar kettra Ḥasan el-ṣighaiyir yeḍauwī l-fatila. A large boat and many soldiers. Little Ḥasan lights the lamp. The sky, the stars and the moon.

Ana shāyil ahālī inta shin biddūr? I am going home, what do you want? The words of a man to his shadow.

'Indī talāt bagarāt wāḥda akalat mā shāba'at wāḥda ragadat mā gāmat u wāḥda sarahat mā saḍarat. I have three cows, one eats and is not satisfied, one lies down and does not get up, one goes to graze and does not come back. Fire, ashes and smoke.

'Atūdi wa el-ḥarām ḍabaḥtō el-leila bakir gām. My little goat, confound him, to-day I kill him and to-morrow he is up again.

Gum on a tree which grows again after being picked.

Bint el-mek fī tāga wa dumū'a nattāga. A princess in a niche and her tears are streaming down. A candle.

Hūwa gadr gurṣ el-ragīf ishūfō el hina wal fil-rīf. It is the size of a loaf of bread, but it can be seen by a person here and one up country. The moon.

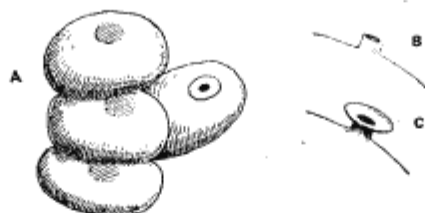


FIG. 4 A Cells of *Eumenes* sp. probably *lepelletieri*, Sauss., showing three closed and one still open.
B. Last stage but one in building of necked funnel.
C. Necked funnel completed.

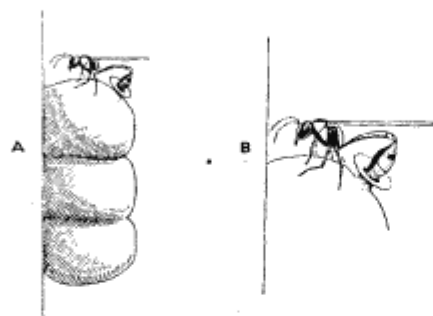


FIG. 5. A. *Eumenes* sp. probably *lepelletieri*, Sauss., laying Egg. B. Enlarged view of wasp. Profile of Nest shown in Fig. 4.



FIG. 6. *Eumenes* sp. prob. *lepelletieri*, Sauss., Nest fingered in Fig. 4 & 5 hidden by final almost smooth coating of mud.



FIG. 7. Three cells of *Sceliphron spirifex*, L., one still open.



FIG. 8.
Nest of *S. spirifex* completely hidden by final outer cover of smooth patches.



FIG. 1. Cells of *Eumenes maxillosa*, de Geer, showing two closed and one still open with *sessile* funnel.

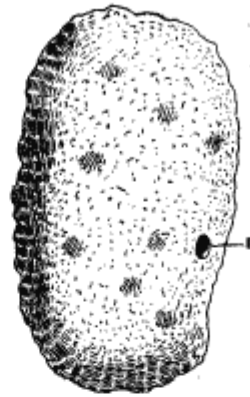


FIG. 2. Same nest shown in Fig. 1, completed and covered with final *granular* coating of mud.
E=hole made by a newly emerged wasp to escape from its cell.

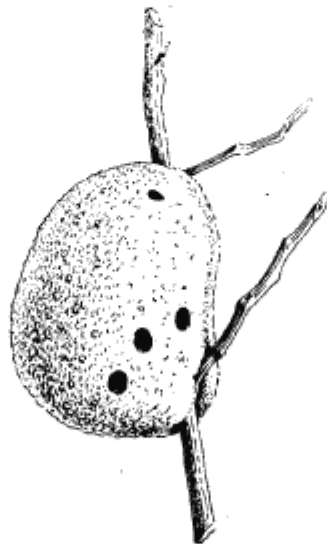


FIG. 3. *Eumenes maxillosa*, de Geer, nest found in a *Poinciana* shrub. Showing holes from which wasps have emerged each from its own cell.

N.B.—All figures reduced to $\frac{1}{2}$ natural size.

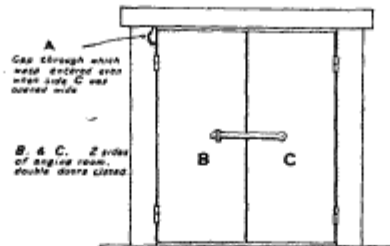


FIG. 9. Engine Room double doors closed, *S. spirifer*, L. left the room by C when it was open; but, whether C was open or shut, always returned through the small hole at A—never, apparently, having profited by experience gained on outward journey.

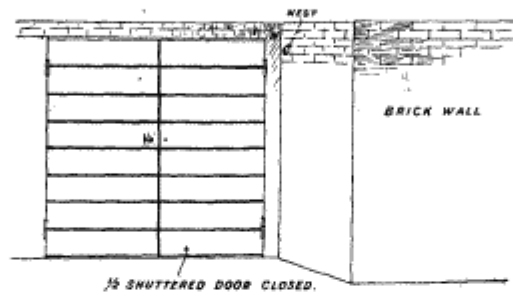


FIG. 10. Shuttered doors in altered position, i.e. closed in order to reveal nest.

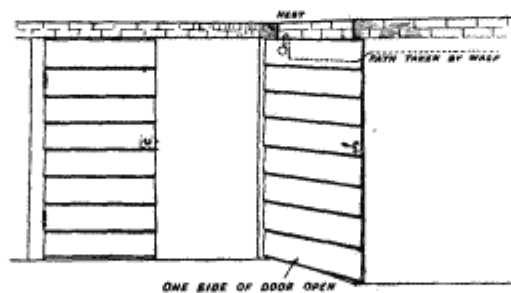


FIG. 11. Shuttered doors half open with edge projecting beyond corner of wall, as it had been all day.

The wasp (*S. spirifer*) relied upon finding the projecting edge to locate her nest.

N.B.—All figures reduced to $\frac{1}{2}$ natural size.

NOTES ON FOUR SUDAN SOLITARY WASPS.

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In the following pages I have given a short account of some preliminary observations made during July and August, 1920, at Shambat near Khartoum on certain Solitary Wasps—insects belonging to the Order of Hymenoptera.

The Hymenoptera or "Membraneous Wings" comprise at once some of the most familiar and some of the least known members of the insect world. In it we find the Ants, Bees, Wasps, Saw-flies, and the vast host of parasitic forms or Ichneumon-flies (using the term in its wide sense). Great variation in form, food and habits is found in this order, though there is such a strong family likeness that its members cannot easily be mistaken for those of any other order.

Those that are winged have four membraneous wings; the fore and hind wing often being linked together by a series of small hooks. The females are provided at the end of their bodies with either saw, sting or ovipositor.

The larger Humble bees and Hornets and the minute parasitic forms offer us as much contrast in size as do the African Elephant and the Pigmy Shrew among Mammals. Some are vegetarians, as the Saw-flies⁽¹⁾, the larvae (or grubs) of which so much resemble caterpillars (or larvae of Butterflies and Moths) that they have been termed "false caterpillars"⁽²⁾; the larvae of the Wood-wasps burrow in the

⁽¹⁾ Think of the Gooseberry and Currant bushes stripped of their leaves by swarms of "false caterpillars", the grubs of a Saw-fly, *Nematus ribesii*.

⁽²⁾ The caterpillars of Moths and Butterflies have, as do the larvae of Sawflies, 3 pairs of front legs, but never more than 4 pairs of middle legs (called pseudo-legs). False caterpillars may have 6 or more pairs.

wood of trees; the Gallflies form excrescences or galls on various plants; others are parasitic and live at the expense of and sometimes inside other insects; the Burrowing and Solitary Wasps and the Ants are omnivorous; and the Bees feed on pollen and honey of flowers.

No order of insects is capable of greater appeal to the popular imagination, or offers more romance and poetry than does the Hymenoptera. Examples of co-operation and of industry, they have been on the tongue tips of moralists throughout the ages. "If" said Sir John Lubbock, "we judge animals by their intelligence as evinced by their actions, it is not the Gorilla and the Chimpanzee but the Bee and above all the Ant, which approach nearest to man" (1). But we have also the individualist in this Order, who works alone, has no example to imitate, no precept to follow, and never sees the young for which it toils with such assiduity and skill. It is with these individualists that we are now about to deal.

The four Hymenoptera, some of whose habits are described in the following notes, are all "Wasps" and belong to the Hymenoptera Aculeata, that is they are each provided with a sting.

Their place in the insect world is shown in the following table, in which their names are shown in italics:—

Order:	HYMENOPTERA.			
Suborder:	Sessiliventres		Petiolata	
Families:	Cephidæ (Stem-sawflies)	Oryssidæ	Siricidæ (Wood-wasps)	Tenthredinidæ (Saw-flies)
Series:	Parasitica		Tubulifera	
Families:	Cynipidæ (Gall-flies) Ichneumonidæ Etc.		<i>Chrysididæ</i>	
Division:	(I.) Anthomophila, or Apidæ, (Bees).	(II.) Diploptera, (Wasps).	(III.) Fossores.	(IV.) Heterogyna.
Families:		1. <i>Eumenidæ</i> , (Solitary True Wasps).	1. <i>Scolidæ</i> - 2. <i>Pompilidæ</i> (Runners).	Formicidæ (Ants).
		2. <i>Vespidæ</i> (Social True Wasps).	3. <i>Sphegidæ</i> , (Perfect Stingers).	
		3. <i>Masariidæ</i> .		

(1). *P. Ent. Soc. London*, 1866, p. LXV.

Though they have been placed in different families and differ somewhat in shape and habits, all have at least one habit in common: the female provides her offspring with living meat—the bodies of creatures she has previously rendered practically powerless.

The story of this group of insects has been discovered to us by Darwin's inimitable observer, the *beau idéal* of Entomologists, Jean-Henri Fabre. In his *Souvenirs Entomologiques* ⁽¹⁾ he unfolds this romance in such clear and beautiful language that all from scientist to child may read and understand with delight.

The "Large Dark Red" Solitary Wasp.

(*Eumenes maxillosa*, de Geer).

This species is the largest of the mud vase makers that I have observed; and seems to be the commonest in Khartoum (at least from April to July, the period during which my observations were made there), though, at Shambat, the third wasp described — The "Black and Yellow" Solitary Wasp — was more often seen during July and August.

I have found the nest of the Large Dark Red Solitary Wasp attached to the outside brick wall of a house under the shelter of the veranda; on the inside wall of my bathroom and of other buildings; and on the back of a side-board in a dining-room.

The nests I have found have generally consisted of from one to six cells; the larger number being more usual. Once or twice I have seen groups of some twenty cells, and wondered whether more than one builder had been at work.

The single cells were all uncapped, and I am inclined to think that the wasp must have met with some accident, been disturbed or have forgotten where she had made her first cell. On one occasion I did find a nearly full grown fat white grub in one of these single uncapped cells.

The cells (Fig. 1.) are made of mud which is rapidly collected from the ground outside, and carried between the forelegs in a pellet of about the size of a pea. When the wasp reaches the chosen site she moistens the pellet with saliva from her mouth, thereby making it glisten, and works it into the cell wall.

(1). *Librairie Delagrave, Paris, 15 Rue Suffot.*

The shape of the area covered by a finished cell is that of an obtuse ellipse. The wasp starts making the walls of her cell at both ends of this ellipse. Then she gradually forms the lower portion, and, when the bottom of the cell is nearly completed, joins the top ends and builds round and round the cavity so formed until only a small hole is left. The pellet is manipulated by the front pair of legs and the "chin" or posterior lower portion of the head. The wasp rolls her little ball backwards and forwards in a semi-circle, moistening it the while with saliva. Then, as the cement takes hold of the surface on which she is building, the little ball loses its pellet shape, getting squeezed out by the forelegs on the outside and the "chin" on the inside. Both tools work from below upwards. The mud cement is thus worked into a smooth semi-circular wall, slightly curved in towards the centre of the ellipse.

The cell completed, the wasp inserts the posterior of her abdomen into the hole and, curving it upwards, deposits an egg on the ceiling from which it hangs down by a very short thread.

After laying the egg the wasp flies off to seek provisions for her larder. This species supplies its cells with the green caterpillar of *Catopsilia florella*, a white butterfly the caterpillars of which feed upon the Sennas⁽¹⁾. Three of these caterpillars are usually supplied to each cell.

If the stores were packed into each cell alive the delicate newly hatched wasp grub would stand little chance among the wriggling mass, even if the egg survived. The wriggles would increase as soon as the babe attempted to suck. On the other hand, if the food was supplied dead, decay would set in before the grub had, so to speak, begun to teethe. A happy medium (though solely from the wasp-grub's point of view!) is therefore struck: the caterpillars are paralysed. An unfeeling, scarcely protesting dish is served up on the nursery table, to be eaten at leisure — eaten in the dark where it cannot even see the growing and gluttonous babe.

The nerve centres of a caterpillar are not united, as in man, to form a brain and a spinal cord, but are distributed throughout the length of the body, each segment having one nerve centre or ganglion. Unlike the nervous system of man and other vertebrates, which is

(1) *The Wild Beladi Senna (Cassia obovata) and the cultivated Senna Mecca (C. acutifolia).*

situated along the dorsal side of the body, that of an insect runs along the lower or ventral side.

Henri Fabre, in his *Souvenirs Entomologique* has given a fascinating description of the way in which these wasps render their prey helpless. Seizing the caterpillar and standing on its back, the hunter curves her abdomen below the captive's body and thrusts her sting into certain of the ganglia, thus paralysing the legs and depriving the caterpillar of the power of any great movement. I say of great movement because, though incapable of walking, these paralysed caterpillars can sometimes move their bodies a little, cling to the surface on which they stand, void excrement (from food swallowed before they were stung) and in some cases pupate, i.e., turn into a chrysalis.

One of these Dark Red Wasps built a set of cells (Fig. 1.) one above the other on the outside of a window-pane in my bed-room at Shambat. On July 26th I found a green caterpillar hanging half out of the open mouth of the third cell from the bottom (the lowest one was built first). The wasp had probably gone off to collect mud to close the cell, and the caterpillar had wriggled off the top of its other two fellow victims.

I robbed the cell of all three caterpillars and placed them in separate glass tubes. One of the grubs was injured by the forceps in removing it from the cell, and quickly turned black and dried up in three days. Of the other two one was quite brown and decayed by August 2nd (that is in 7 days); the other, which was the one that had wriggled half out of the cell and been the fattest from the beginning, split its skin behind the head in an effort to pupate. But it got no further and had decayed by August 5th, that is in 9 days.

Three caterpillars taken from the cell of another wasp of this species all pupated, but in two cases they had not been able to divest themselves entirely of their larval skins, which remained attached to both ends of the body. Consequently the chrysalids became bent in the shape of a bow — the larval skin forming the bow-string. On another occasion two larvae succeeded in pupating and getting free from their larval skins, but in a few days, though still green, one was covered with the mycelium of a fungus, and the other became flabby and had turned dark brown and dried up.

On July 28th the cell from which I had stolen the three caterpillars, but not the wasp egg, had been closed. Had my theft been dis-

covered? Had the larder been replenished? Not wishing to disturb the goose that was laying such golden eggs of information, I left the question unanswered for the time, and watched the fourth cell, which had been started immediately above the third.

The builder took less than a minute to fetch each fresh pellet and return to the cell. At the end of two hours the cell was completed and a single egg laid. I cannot say that the cell took two hours to build, as I was absent for part of the time and returned to find the egg laid.

The hole was uncapped so I stole the egg from its thread; it was slightly yellow and measured about 4 mm. in length.

The wasp did not return that night, so that the egg, had I left it hanging from its ceiling, would have been at the mercy of any marauder. I saw that Jacob, that cuckoo among the Vase-Makers, a large green Chrysid — one of the "Ruby-Wasps" — loitering round the cells, but did not see her do anything suspicious.

She and her tribe lay their eggs in the nests of others; and their grubs feed on those of their unwilling hosts.

On the morrow, July 29th, the wasp returned and laid an egg in the cell which I had robbed. The egg was rather smaller than the first one laid, and only one caterpillar was put into the cell before it was closed. The wasp examined the cell carefully with her antennae at every visit, and, as I had slightly damaged the entrance when removing the egg, her suspicions may have been aroused.

When the wasp had finished building the cells, she started to fill in all the spaces between them with mud. On the completion of this operation, the beautiful shape of the cells was entirely lost, the whole surface of the nest being covered with a rough granular coating of mud (Fig. 2.).

Just before this coating was added I saw a green Chrysid examining the surface of the nest. I did not see her attempt to insert an egg, but if she had succeeded in doing so unobserved, the wasp had covered it in with this rough outer coating of mud; and in that case her protective measures had been taken too late.

I glued a piece of muslin over this nest to trap anything escaping from it. On August 12th before anything had come out, a wasp of the same species (possibly the same one) started to build on the outside of the muslin. She built four cells and covered them with an outer coating of mud as the nest below had been covered. She took

two minutes to collect each pellet of mud and an average of three to work it into the cell.

This wasp had started work when the window was closed, coming through a hole cut in the outside shutter. The window opened inwards, and when I opened it, the wasp was quite at a loss to discover the nest though she passed quite close to it. She flew all round the room frequently knocking herself against the walls and the inside of the other closed and shuttered window. She did not find her cells until, when she had departed by the way she had originally entered, I half closed the window on which her nest was placed. Then, on returning, she flew to it, and, having disposed of her burden of mud proceeded to fly on and off the nest for about five minutes as if perplexed. Whilst doing this she never went more than four inches away from the nest, and on settling did so with a jerk accompanied by a slight but distinct noise—a kind of click.

From the first cell of the nest in my bed-room, which was built on July 24th, a wasp emerged on August 17th, that is in 24 days; and from the second cell, which was built on the 25th or 26th a wasp hatched on August 20th, that is in 26 days. So that the development of this wasp from egg to adult took a little under a month.

Of the caterpillars removed from the nest and kept in glass tubes one died and decayed in 7 days, another in 9, and others in shorter periods. As the wasp grub can only feed as a grub, and then only upon fresh food, this would seem to indicate that the transformation to pupa or chrysalis must take place in about a week; and that about two thirds of the time spent in the cell must be passed in this resting stage.

A Chrysid came out of the 4th cell on August 22nd. This cell had been closed and covered with a coating of mud on July 29th, and as the chrysid grub probably must have had to wait to hatch until the wasp grub had not only done so, but grown fat upon the butterfly caterpillars, it must have taken the Chrysid less than 25 days to develop from egg to adult.

Before leaving this preliminary account of observations on this Dark Red Solitary Wasp, *Eumenes maxillosa*, I should like to draw the reader's attention to a small point which may give him, if he wills, food for reflexion and possibly amusing experiment in an idle hour during the hot weather.

Eumenes maxillosa constructs a cell of which the longer axis is

horizontal. The egg depends from the centre of the ceiling, opposite the entrance hole, and not to one side, as in the case of that of the Eumenid wasp figured by Sharp⁽¹⁾. Yet when the wasps emerge from their respective cells, they all make their exit from the same side of the nest.

This is quite understandable in the case of the "Yellow-waisted Black" Solitary Wasp, *Sceliphron spirifex*, who lays her egg on the first spider put into the bottom of a cylindrical cell, as described on page 101 of these notes. In the case of this last mentioned wasp the egg is placed at the far end of a cylindrical cell and presumably, the grub feeds forward towards the opening, possibly dragging the spiders to itself one by one and devouring them in the order, in which they were put into the cell, so that the one that is weakest on account of its longer period of starvation is consumed first.

In this case the heads of the pupating larvae would be towards the capped end of the cell, and it is quite natural that they should make their exit through that end; and, as the cells all face more or less in one direction, the wasps would all emerge from one side of the nest.

But what determines the direction in which the head of the full-fed *E. maxillosa* grub shall lie when about to pupate?

If the grub does make for one end of the cell on hatching, why should all in the same nest elect to consume their banquet from the same end of their respective cells? What a dull restaurant, all in dark rooms, each just large enough to contain diner and food; each in a separate one and, each sitting at the same end of its table. *Ma foi quelle tristesse!* A London Club dining-room with each member at his own little table each with his back to the same wall, each facing the same direction, dining in complete darkness owing to a combined strike of electricians and candle-makers, would indeed offer a more cheerful picture—one could at least talk; no cubicle wall to separate one from one's neighbour.

In September I found a ball of earth rather smaller than a tennis ball round a branch of a Poinciana shrub (Fig. 3.) I cut it out and placed it in a breeding jar. Wasps, seemingly identical with *E. maxillosa* from mud cells attached to walls, came out of it in due course and in this case made their exit from two sides of the somewhat flattened ball.

(1) *The Cambridge Nat. Hist. Vol VI.—Insects Pt. II. p. 73. Fig. 28. B. Eumenes arbustorum.*

**BRIEF DESCRIPTION OF THE WASP, (*Eumenes mazillosa*, de Geer),
FOR IDENTIFICATION.**

Adult.

- Size :** About 4 centimetres long. Mid-body, or Thorax, 6 millimetres broad at its greatest width. Wings about 2.7 centimetres long.
- Colour :** Eyes, Thorax and Abdomen a very dark red—almost to black—with dull red showing through, especially at the edges. Clypeus, or front part of the face, Antennae, Legs and Pedicel or stalk connecting the Thorax with the pear-shaped Abdomen, all a dull red. Wings dark; when closed a dark violet.

Egg.

- Size :** 4—4.5 mms. long.
- Colour :** Gelatinous white tinged with yellow—sausage-shaped.

Larva.

- Size :** Average of several full-grown ones—2.5 cm.
- Colour :** A fat opaque white legless grub.

Pupa or Chrysalis.

- Size :** 1.9 cm. long as it lay, not stretched out; stretched out 2 cm.
- Colour :** White tinged with yellow.

Note.—The description of the adult was taken from a pinned specimen; the measurements are only approximate to help the reader to recognise the wasp when he sees it, and are not scientifically accurate.

The description and measurements of egg, larva, and pupa were made from fresh specimens and are accurate.

The "Yellow and Red" Solitary Wasp.

(*Eumenes* sp. possibly *lepelletieri* Sauss.)

This wasp is only about half the size of the large Dark Red Wasp just described. I have only seen one of the species alive. I saw her first flying about in July 31st, but did not find her cells until the 2nd of August, when I found her building in the door-way of the drawing-room at Shambat. The spot chosen was only four feet from the ground, so that I was able to observe with ease.

She constructed four elliptical vase-shaped cells similar to those of the Dark Red Wasp but smaller (Fig. 4.).

When I first found the nest the third cell had just been begun in exactly the same way as the Dark Red Wasps started hers,—that is from the long axis of the ellipse, working up the lower portion of the cell, and then starting the roof and bringing it down to meet the

lower portion, thus leaving only a small hole. This entrance hole was not left exactly at the front of the cell, but rather at the point at which the roof curved downwards.

In the three last visits she constructed a small-necked funnel from the edges of the hole (Fig. 4 B, & C). When making this funnel she kept both antennae in the hole close to the mud and moved round and round the cavity until it was finished. The funnel itself was completed at the last building visit. She took about half an hour to build one cell and lay her egg.

Having completed the funnel she turned round and, facing the wall (Fig. 5 A & B) curved her abdomen into the tube, moving it in and out, though never entirely extracting it, for about 20 seconds. Then turned round, put her antennae into the hole, and examined the interior. Then again facing the wall she reinserted the posterior portion of her abdomen, making the same movements as before. This time she did not withdraw for about 40 seconds; and when the operation was finished she flew away as if it had fatigued her. Perhaps, at the first attempt, she had been preparing the surface for attachment of the egg thread, or possibly merely failed to fix it there.

At 9 a.m. on the following morning, August 3rd, nothing seemed to have been touched. The third cell, made on the previous day, remained still uncapped. At 10.30. a.m. this cell had been closed and no trace of the beautiful funnel remained. There was only a splotch of mud in its place, forming a mere rough though distinct prominence on an otherwise smooth surface (Fig. 4.A, 1,23).

A fourth cell was started at a little after one o'clock and finished by two in the afternoon.

At this point a large green Chrysid appeared on the scene. It was searching the walls obviously looking for a group of cells. I drove it gently in the direction of the doorway in which this group of cells was situated. In two or three minutes I had succeeded in getting it there. But, though it alighted several times on the side of the doorway to which the cells were attached, it settled each time above the group. And, as it always hunted the wall upwards, it missed the nest several times, though twice starting within a couple of inches of it. At last, finding the cells, the Chrysid wandered enquiringly over them. To my surprise it took no interest in the newly made and open fourth cell, in which I had just seen the wasp lay her egg. Instead it examined the capped ones and then, without doing anything further,

retired to a spot about six inches round the corner of the wall and some ten inches from the nest.

There it took up its position and, having cleaned its antennae and ovipositor, remained motionless as if resting. It remained so for about ten minutes; only moving twice during that time. Both times it suddenly turned sharply about, as if it had heard something. It was waiting for the wasp.

At the end of ten minutes a Yellow-waisted Black Solitary Wasp (*Sceliphron spirifex*), which had its nest on the other side of the doorway, flew past to her building. Whether this disturbed the Chrysid or deceived her, or whether she had merely finished her rest, I cannot say, but she moved round the corner of the wall and re-examined the cells. Then, placing herself head upwards on the lower portion of the third cell, she made a small hole in its wall with her mouth parts, and turning round, so that her head pointed downwards, inserted her ovipositor, from which sufficient moisture seemed to come to soften the mud round the entrance. The ovipositor was gently eased out of the hole so that the mud closed around it as it finally withdrew.

Just as this operation was completed the owner of the cells appeared laden with a green caterpillar of the same kind as that collected by the Large Dark Red Solitary Wasp. She flew heavily after the Chrysid, which had hastily moved about ten inches down the wall, and chased it away. The Chrysid then flew off to the arm of a chair about three feet away, where she sat facing the nest—waiting a further opportunity.

Meanwhile the wasp hurried to the fourth cell and passed the caterpillar in "hand over hand" or, more accurately, tarsus under tarsus. Then she anxiously searched this cell and afterwards the other three. Her attention seemed chiefly given to the last cell, which she had just provisioned and which had been left open with an egg hanging from its roof. But, though she passed the tips of her antennae several times over the spot at which the Chrysid had made her hole, and in spite of this spot still being damp and so clearly visible, she never discovered it. Twice she flew away for a short distance and twice returned, as if still anxious and dissatisfied, but only to search in vain.

All this time—about 5 minutes—the Chrysid had sat motionless on the arm of the chair awaiting, I suppose, the departure of the wasp. Having, unfortunately, to go away, I caught the loiterer in a glass

tube. She was so interested in watching that she never saw the hand and tube approach from behind.

The egg of the wasp, as already described, is attached to a thread and hangs from the ceiling of the cell. The Chrysid punctured the lower portion of the cell and consequently somewhere near where the first caterpillar had been placed. As the cells had been started only four days previously and this one was the third of the set, the wasp grub could only have been very small if it had hatched at all; and, if hatched, it would have been sucking the topmost caterpillar.

And, as observed by Fabre,⁽¹⁾ the young grub on leaving the egg still hangs on to the shell, which splits up into a kind of ribbon, so lengthening the thread as the food below decreases. Thus the babe is enabled to eat its first meals from a safer position than if it wandered among the writhing mass.

The chrysid grub would have been separated from its quarry—the wasp grub—by the moving bodies of more than two caterpillars; which would seem to be as dangerous a position for it as for the young of the wasp.

This would seem to indicate that the chrysid egg probably does not hatch until the wasp has at least reached the lowest, and by that time the weakest, caterpillar and is near the helpless, resting pupal stage—which in the case of *E. maxillosa* takes, as we have seen, about a week.

As has already been mentioned in the account of the preceding wasp, the builder, through accident or lapse of memory, may never return to place provision below the suspended egg. The cell may therefore, remain empty. This would mean that, on hatching, the wasp grub would die of starvation; so that there would be no fattening white grub for the embryo Chrysid grub to look forward to. It seems to me therefore, that the Chrysid was waiting for the wasp to return and put the first grub into the newly made uncapped cell before she risked laying her egg there. She may have also realised that the wasp might return at any moment, thought discretion the better part of valour, and deemed it prudent to wait until the first caterpillar was deposited and the owner of the nest once more departed in search of a second, thus giving her full time for her operations.

In view of the remarks made by Sharp⁽¹⁾ as to the apparent indifference of the host to the parasite, it is interesting to note that this

⁽¹⁾ Sharp, *Camb. Nat. Hist. Insects Pt. II. p. 73.*

wasp was decidedly anxious when she realised that the Chrysid had been near her nest; and that she made an attempt to drive it off, though being laden at the time, the attempt was a somewhat feeble one.

No wasp came out of any of the four cells. From the second cell two Braconid parasites emerged on August 15th 1920, and from the third a chrysid appeared on August 28th.

On August 11th this wasp covered her cells with an outer coating of smooth mud (Fig. 6).

SHORT DESCRIPTION OF AN EUMENID WASP,
possibly *lepelletieri*, Sauss., CALLED HERE THE YELLOW AND RED
SOLITARY WASP.

Adult.

Size: Varies from 2—2.5 centimetres long; and from 2—3 millimetres at broadest part of Thorax.

Wings 1 to 1.5 centimetres long.

Colour: Clypeus or front part of face, frons or forehead, Pronotum of fore part of Thorax, Metanotum posterior portion of Thorax, yellow; centre portion of Thorax or Mesonotum, line down dorsal centre of Abdomen and rings reaching from it to lower or ventral surface, black.

Antennae, Legs, Pedicel except at its ends, red. Pedicel at fore end tipped black; at hind end central dorsal black mark, with yellow spot at each side. Wings; yellowish, clouded at tips.

Note. Measurements taken from pinned specimens and are therefore only approximate.

The "Black Yellow - Waisted" Solitary Wasp.

(*Sceliphron spirifex*, L.).

I have only seen this wasp twice in Khartoum; that was on September 20th, some time after these notes were made. It was, however, quite the most frequent visitor to the house and buildings at Shambat during July and August.

It builds a cylindrical mud cell shaped somewhat like a cigar with a cut end (Fig. 7). The cell is usually placed more or less horizontally—I have never seen one quite vertical—on the walls of buildings either in or outside. I have found them on the bare

(1) *Cambridge Natural History, Vol. VI, Insects Part II, pp. 30 and 31.*

electric light wires in the dining-room; on an ornamental bulge in the metal shaft of an electric light fitting hanging from the ceiling in the centre of the room; in the upper cornice of a door and of a window; and over the lintel of a door.

A group of from three to sixteen cells formed a nest. Sometimes the outer surface was quite smooth, sometimes there was a distinct set of ripples shaped like a half ellipse with the apex pointing towards the closed end of the cell: and once I saw a beautiful cell built so that each side of the half ellipse overlapped the other, just as puttees are sometimes criss-crossed instead of being put on in the regulation spiral.

This species of wasp starts building a cell from the closed end, building at every visit more at each side than at the top: hence the ripples (Fig. 7). The criss-cross which I have only seen once, must have been an accentuation of these ripples, each side having been added at alternate visits. Each cell is carefully capped; the cap being started about a millimetre down the inside of the cylinder and then filled up to the brim.

The mud is collected in the same way as by *Eumenes maxillosa*. However, whereas the latter flies with a loud and deep buzz when approaching her cell, but works almost silently only occasionally uttering low grumbles, this wasp flies silently but often makes a shrill buzz whilst she is building. I had so often surprised her buzzing softly in this high key whilst capping her cells, that at first I was led to suppose that she only did so whilst thus occupied—a contented buzz, as if to say "thank goodness that is nearly finished". But afterwards I found that this was not the case, and that the sound was made during any period of building. On hearing it I have now come easily to recognise the presence of both wasp and nest.

When the nest is finished the builder covers the entire surface with mud as do the first two wasps described in these notes, but, whereas *E. maxillosa* covers her cells with a granular coating of mud (Fig. 2), and the Yellow and Red Eumenid leaves hers with a practically smooth surface (Fig. 6.), *S. spirifex* hides hers below a patchwork (Fig. 8). Each patch is smooth and represents the contents of one pellet and the labour of one visit. The patches at the edge curve down very smoothly to the surface on which the nest is placed.

Each cell contained 14 to 16 spiders of various sizes and different species: some being quite incapable of movement, others being able to move their legs. I found the egg, which is slightly curved, on the last spider in the cylinder, that is the first inserted. The egg was placed on the side of the spider's abdomen and partly under it so that it curved up towards the back.

On one occasion I took a group of four cells; and in each found fourteen spiders belonging to at least three species, mostly of the family of *Epeiridae*, or Garden-Spiders, and at least one to that of *Attidae* or Jumping Spiders.

In another set of three cells I found a yellow pupa and two nearly full size grubs. The latter I placed in two uncapped cells with their spiders. But they both left their cells in a few days and lay in their glass jar. In another set of three cells a very small grub about six millimetres long and two eggs were found. I placed one of these eggs on its spider and put it with its other thirteen future victims into its cell, which I closed with a cap and cement made by the wasp. To make the materials workable, the cement was moistened with a little water and smoothed over with a pin. The second egg I put into a glass tube with its spiders; but small red-brown ants got through the cork and consumed the contents.

On August 1st, whilst visiting the engine room I saw one of these wasps make its way through a small gap, A, which existed between the brick-work of the door-way and one side of the double doors (see Fig. 9) although the other half door, C, was wide open. She had to hesitate in her flight in order to pass through this narrow gap without hurt and reach her nest, which was on the opposite side of the engine-room. When she had properly disposed of her pellet she flew straight through the open half of the door without any hesitation. I suppose that she could not well miss the large expanse of light. I saw her repeat this performance twice; on each return journey she went by the small and narrow passage, so she had not benefitted by experience gained on the outward journeys.

On another occasion, whilst sitting on the verandah of the house, I saw one of these wasps hunting along the house wall. Every now and then she flew off outside to return again at once as if puzzled and half inclined to give up the search. Knowing that there was a nest in course of being built on the upper side of the brickwork of the doorway, I guessed it must be hers. Why this

difficulty in finding it? What had been altered in the immediate surroundings? Then I realised that to get a better view of the nest I had closed the outer shutter, which had been standing open all day (the shutter opened outwards against the brickwork of the door-way on which the nest was situated, and projected just beyond the corner of the wall). So I reopened the shutter, when she promptly left the wall and flew round the edge of the shutter, and over the top to her nest (Figs. 10 & 11). So much for observation, bump of locality, memory and intelligence!

The unhesitating way in which the "Black Yellow-Waisted" Wasp leaves her nest as soon as she has completed the object of her visit is very marked. There is no loitering; she makes a direct line from the nest to the open air.

I have seen a green Chrysid visit the nests of this wasp, but never in a position in which its action could be observed.

One morning, when the nests of this species had been brushed down from high up on the wall of the dining room, I saw the owner of one of the destroyed nests go and walk over one that had escaped the wanton broom and inspect in company with its rightful owner, who was busy building. This attention seemed rather to disturb the owner of the cell. She left her nest and accompanied the victim of the houseboy's energy to various parts of the ceiling and electric wire. Later in the day I found a second nest had been started on the electric wire about ten inches from the undisturbed one.

I have often found pellets of mud below the nest of this wasp. She must have dropped them for some reason and not troubled to recover them. I have also noticed that *Eumenes maxillosa* sometimes drops her caterpillars below her nest, leaving them there to the tender mercy of the scavenger ants. I have collected paralysed caterpillars and placed them in conspicuous positions near the nest but have never seen them made use of.

These wasps took about 26 days to develop from egg to adult.

BRIEF DESCRIPTION OF *Sceliphron spirifex*, L., FOR IDENTIFICATION.

Adult.

Size : Varies a good deal—specimens at hand=2.5 cm. long, but have seen some several millimetres smaller and others a little larger. Thorax, at greatest width=4 millimetres: Wings=2.5 cm. long.

Colour : All black except the Pedicel joining thorax and abdomen, and portions of the legs which are yellow.

1st pair legs : Coxa, Trochanter, and Femur (i.e. 1st, 2nd and 3rd joints) except at tip black; lower tip of Femur, Tibia (4th joint) and Tarsus (5 last joints) a warm dull yellow.

2nd or middle pair of legs : Coxa, Trochanter, and Femur except at tip black; lower portion of Femur and Tibia dull yellow; Tarsi brown.

3rd pair legs : Coxa, lower half of Femur, lower third of Tibia, upper tip of 1st joint and whole of last two joints of Tarsus black: Trochanter, upper half of Femur, upper two thirds of Tibia, and first two joints of Tarsus warm yellow; 3rd joint of Tarsus and lower tips of 1st and 2nd joints, brown.

Wings, clear, tips slightly clouded; nervures dark brown.

The "Dark Blue Yellow - Whiskered." Solitary Wasp.

(*Salix (Cyphononyx) lynx*, R. Lucas).

This wasp belongs to the family Pompilidae or Runners, which is part of the third Division of the Hymenoptera Aculeata, namely the Fossorial Solitary Wasps.

Yellow Whiskers was fairly common at Shambat; and I have frequently seen it running about energetically in the grass on the lawn and on the paths and dry gadwals⁽¹⁾ as if seeking for something. On one occasion I carefully watched this Pompilid for nearly an hour whilst she was hunting. The grass on the lawn was not continuous turf so that she could easily run about between the plants as if in a miniature wood.

She ran quickly keeping her antennae bent down to the ground so that the distal third, which was curved outwards and back like the blade of a sickle, swept over the surface. Since the antennae are worked independently, one sometimes tarried behind a while to examine further some small clod, twig, or tuft of grass.

(1) *A small irrigation channel.*

The wings were carried folded along the back. Occasionally the folded wings were raised slightly and dropped back into position without being opened or separated. The movement, though made quickly, was deliberate and could scarcely be called a vibration.⁽¹⁾ The wings were only opened in preparation for flight, when alarmed, or to avoid some obstacle such as a blade of grass or twig, which, as she kept her eyes "glued to her boots" she was very apt to encounter. The wing on the side of the obstacle was then raised to help her turn away from it.

She hunted the ground assiduously, frequently doubling in her course then flying off for a few yards to try a new piece of ground, and then returning to hunt and rehunt just like a working spaniel. The search seemed in vain and I only saw her make a movement, which promised any interest, once during the whole hour. When passing over a small pile of freshly turned up earth she hesitated for a second, and seemed to prod her ovipositor into the middle of it. Going to the spot, I dug up a small Cockchafer, a Melolonthid. But I could find nothing on the chafer; and, though I dropped one of the same species in front of her several times, it proved of no interest and only served to frighten and make her fly away.

On August 5th, passing along a gadwal near the tennis lawn, I saw one of these wasps dragging a large grey spider up the gadwal bank, through the base of a hedge, and down the river bank, covering about fifteen yards. She moved backwards the whole way pulling the spider head first. Having completed this somewhat lengthy journey, she dragged her victim down a hole about a foot from the water's edge. On the way she stopped several times, left the paralysed spider and ran about as if looking for something. Sometimes she flew some distance, alighted, searched the ground and then flew back to where she had left her victim.

On reaching a clump of young plants near the water's edge, she left the spider under their shade and made her way to the hole about a foot away. She half entered the burrow, apparently to satisfy herself that all was well; then returning and seizing her prey dragged it down out of sight. She had not reappeared at the end of ten minutes, when unfortunately I had to go away. Shortly after the wasp and spider had disappeared down the hole, a cricket appeared in

⁽¹⁾ *Sharp, Cambridge Nat. Hist. Insects Part II. p. 101.*

the entrance, but did not come right out. Was the cricket the rightful owner of the burrow? Unhappily nearly four inches of rain fell on the night of the 5th to the 6th of August, and the river rose above the hole, making further observations on this particular wasp impossible.

On August the 8th I saw another wasp hunting on the banks of the same gadwal. Suddenly she became interested in a tuft of grass and moved all round it, behaving as if trying to entice something out from below. She felt forward with one foreleg holding her body alert and well back — rather reminding me of a cat playing with a mouse but rather more on her guard.

The attempt proved unsuccessful and she moved on to other hunting grounds, whereupon I moved aside the grass tuft and found a large spider's hole three quarters of an inch in diameter. The occupant made a movement forward when I touched the edge of its den, but then retreated out of sight. After a minute or two, however, it pushed its egg-bag up the tube. I took the bag which was full of young spiders. Then followed a large spider, which I caught. It was one of the *Lycosidae* or Wolf-Spiders and of the same species as the one I had seen pulled down the river bank a few days before.

BRIEF DESCRIPTION OF *Salix lynx*, R. Lucas.

Adult.

Size: About 2.5 centimetres long; Thorax about 3 millimetres at broadest point.

Fore Wings, 2 centimetres long.

Colour: Eyes black; Thorax and Legs very dark navy blue; Abdomen rather lighter metallic blue; Wings clouded brown with dark blue sheen; Antennae, basal segments brownish yellow, remaining segments orange yellow.

Note. Measurements taken from a pinned specimen and are therefore only approximate.

My best thanks are due to Mr. E. O. McIntosh of the Sudan Government Survey Department for the care with which he has executed the illustrations. The drawings were made partly from sketches in my Field Note Book and data supplied by me, and partly from actual nests. The sketch of the "Yellow and Red" Solitary Wasp laying her egg (Fig. 5), was drawn from a rough sketch which I made as she was in the act and from a pinned specimen. I would also thank Mr. L. E. Robinson for the very kind assistance he gave me in re-arranging Figs. 10 and 11.

NOTES.

A Sidelight on History.

One of the mysteries of the reign of the Khedive Ismail was the death of Ismail Sadiq Pasha, the Minister of Finance and the so-called Mufettish. He held the rank of "Mushir" from the Sultan of Turkey and was a serious clog on the activities of the Khedive and his disappearance occurred at a time when the Minister's opposition to the financial scheme of Messrs. Goschen and Goubert seemed likely to be an effective obstruction. At the time a formal announcement appeared in the "Moniteur Egyptien" of November 10th 1876 to the effect that the ex-Minister of Finance Ismail Sadiq Pasha had been found guilty of treason and had been banished by order of the Privy Council to Dongola.

The following account was obtained largely from Zubeir Pasha during his lifetime, and his evidence as a protagonist in the incident is not without weight:—

In 1873 Ismail Pasha Ayub, the Governor General of the Sudan, received instructions to conquer Darfur, and he employed Zubeir Pasha to carry out the order. Zubeir Pasha collected an enormous quantity of loot, reckoned as worth over ££. 2,000,000, in slaves, ivory and gold, and amongst other things the golden throne of the Sultan of Darfur, and despatched it to Ismail Ayub Pasha.

After the subjugation of Darfur, Zubeir Pasha went to Egypt and had an audience with the Khedive who reproached him for forgetting his sovereign in the division of the spoil. Zubeir protested his innocence and hinted that the loot had found its way to the Mufettish. This aroused the Khedive's wrath and he instructed Zubeir Pasha to go to call on the Mufettish and ascertain if he could find any of the missing loot, especially the golden throne, and he sent his son Hasan to accompany Zubeir and see for himself.

Zubeir called at the three magnificent palaces of the Mufettish and eventually found the golden throne, and the Khedive's son promptly reported the fact to his father. The following day the Khedive asked the Mufettish to go for a drive with him, as was not unusual. The drive however terminated at the Ghezira Palace,

when the Mufettish was handed over to a guard, put in chains and flung into the hold of a boat going South. On arrival at the second cataract he was transferred to a Sudanese guard and taken across country on a camel saddled with only a baggage saddle, and with none of the smallest amenities of life, through the Botn El Hagar to Dongola, and it may well have been expected that such a journey would have been too much for man of his age and habits. Notwithstanding, he survived and reported to the Governor of Dongola, who demanded his parole. That night, according to native story, his neck was broken, and the Governor despatched a notification to the Khedive that God had called his servant Ismail to Him and enclosed a certificate of death duly signed by a doctor.

The place of his burial is known and preserved in Dongola. His property amounting to nearly £E. 3,000,000 was distributed, his harem divided up and his son was compelled to give up the adopted daughter of the Khedive's mother, to whom he had been married the year before.

Women and Blood Revenge.

Inspectors who deal with Nomad Arabs know that in most cases it is a good principle to "*chercher la femme*" as such crimes as are committed can generally be explained by enquiry into the love affairs of the accused. For instance, if there has been a murder it is often due to jealousy about a girl or even a mere desire to show manly courage before the "*henbird*". If a man steals, it is as often as not to obtain money with which to pay the "*mahr*" for the girl of his heart and so on.

The influence of women over the actions of their menkind is very considerable and the following custom is recorded and is a good example of the way the women force the men to their will. A quarrel occurred between the Lahawiin and the Halawiin and a man of some standing was killed. The women of the Lahawiin thereupon wrapped up their right hands and forearms in raw hide rendering the limb useless and swore so to continue until they had been given the forearm of one of their tribal enemies bearing a signet ring. When they obtained the forearm they used it to beat their drum to celebrate the victory. The possession of a signet ring would imply that the owner was of some importance. Thus

the women were compelled to use their left hand only, to eat and drink with, and as this hand is "unclean" and as too the lack of one hand hampered the women in the preparation of food and the performance of their household duties, the men were put to great inconvenience, and have considerable incentive to go and kill their enemy in order to have peace at home.

Amongst the Hadendoa it is recorded that in the old days of constant feud between the Shukria and Beni Amer on the one side and the Hadendoa on the other, if the last suffered a reverse, their women would all retire to one place and refuse to allow the men any access to them until they had avenged their disgrace.

British Consuls at Suakin.

In going through some old books I found a record of the British Consuls of Suakin which may be of interest to many.

The Consulate lasted from 1882 to 1899. The first Consul was Commander Lynedoch N. Moncrieff, R. N. who was appointed in April 1882 and was killed by rebels at el Teib on November 5th 1883. He was succeeded by Augustus Baker, who was acting Consul from December 23rd 1883 to 1st November 1884, when he was appointed Consul and remained till November 19th 1885.

His successor was D. A. Cameron, whose appointment expired on July 1st 1888 although he actually left Suakin for leave on May 16th. The 4th Consul was H. D. Barnham, who served from July 7th 1888 till his transfer to Aleppo in June 1894. The last consul was H. H. Lamb, whose appointment was dated July 16th 1894 and he left for Erzerum in December 1899 when the Consulate was abolished.

A. E. ROBINSON.

Khartoum,

8th May, 1921.

Road Construction across the Cotton Soils of the Southern Sudan.

The whole future of the development of the Sudan south of Khartoum is wrapped up in the provision of adequate and cheap transport,

but wherever possible it is essential that the transport shall be carried on throughout the year, not only in the dry season but in the wet season of the year as well; so that communications shall be continuous and not, as they are at present, intermittent.

The circumstances of the terrain to pass over are difficult in the extreme. Throughout the rains the country is in many places impassable for all kinds of vehicular traffic, and can only be traversed with difficulty by mankind and by pack animals very lightly loaded.

The soil, so called cotton soil, is a mixture of extremely finely divided clays, with greatly varying percentages of sand and organic matter: it further contains a high percentage of alkali.

A small quantity of this clay mixed up with ten times its weight of water yields a slurry through which the sand particles rapidly settle, but the slurry will not settle nor the clay substance precipitate; the liquid clay may be put aside for months on end and still the clay remains in suspension.

The White Nile and its tributaries bring down a silt which is extremely finely divided and at certain seasons this silt is mixed with algae of many kinds. In a measure this extremely fine silt is partly the cause of the extreme difficulties in water supplies along the roads in the dry seasons, but a greater trouble is perhaps the fact that the yearly burning of rank grasses returns very considerable quantities of sodium and potassium silicates to a soil already too rich in alkaline constituents.

From point to point along any given route the nature of the surface varies: in places there are vast cracks, often several feet in depth, with a surface as hard as cement; next following comes a soil with lesser cracks and a higher percentage of sand, to be followed on a small rise by a surface covered with a coarse sand; and on these rises the inhabitants build their dwellings. Now it may be observed that the total fall in any direction is usually very slight, the rains come down and the country goes under water rapidly; in the first instance there is very little subsoil drainage, as, immediately the first rains fall, they are absorbed by the parched clays, which rapidly swell and thereafter practically hermetically seal the surface of the land. When the second rains fall the soil can no longer absorb the water; a portion of the surface clays go into solution and even on the small grade flow slowly to the lower lying lands, leaving the sand behind to form a somewhat lighter soil and finally the sandy ridges above mentioned.

Passing along the foothills of the Southern Nuba hills, the process may be seen to advantage. All along the route the variations in circumstances of the soil are indicated by the changes in the vegetation, the change in the vegetation being at times clear cut as if with a knife: at other times a gradual change takes place depending very largely on the slope or grade and the distribution of the clay matter.

In England, in the heavy soils of some places in Devon and Somerset, the farmer relieves the circumstances of the soil by burning each year the weeds and the hedge clippings, using this combustible material to burn very considerable quantities of clay taken from off the fields: the fire is maintained with the slowest possible combustion so as to yield a burnt earth that readily powders: this red earth is broadcasted over the lands, much as the Fellah of Egypt broadcasts the "sabbakh" of Egypt, and individual farmers in Devon and Somerset tell me that after the third year the improvement is so great that it is equal to from £. 2 to £. 4 per acre spent on chemical fertilisers.

The problem of future transport in the Southern Sudan first attracted my attention in 1917 and the solution of this problem of road making through territory having no road-making material available or handy set me puzzling as to how to overcome the difficulty: there followed a series of studies of the physical circumstances as I saw them, and the only difficulty appeared to be the burning of the material to be used for repairs.

The question of fuel for the purpose is solved by the rank growths of grass that follow with each rainy season, and possess a calorific value little below that of wood.

At the end of each rainy season the road side will be fringed by grasses varying from two to ten feet in height, and by cutting and bundling this by machinery a supply of fuel for any section of the road will be readily obtained at a small cost.

Figures 1 and 2 are illustrations of a small mud kiln that may be built at a very small cost anywhere along the road, either as a temporary or permanent arrangement. The grass will be collected and stacked convenient to the kiln. The clods of earth (clay) etc: will be loaded into the kiln with varying amounts of grass according to the degree of burning found to be most suitable to the particular soil. This latter degree must be arrived at by the simple method of trial and error.

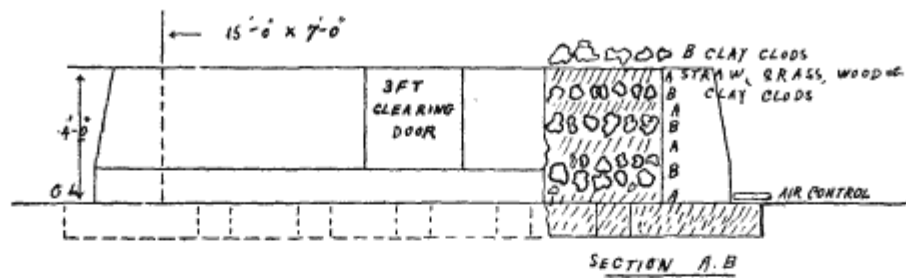
Repairs to the road will be effected by the laying down of the burnt lumps and filling with smalls and a certain amount of the natural earth as a binder, thus each repair will mean the gradual building up of a road, which in course of time will develop into a road surface on which the wayfarer may travel dry shod in the rainy seasons.

Kilns would be burnt at convenient points along the road, and as the kilns are made of the same materials as the road there is no need to put them at too great distances apart, the closer in reason the less distance to transport the burnt material for repairs and building up of the road.

Throughout the study of the problem I have held in view the utmost simplicity so that the natives in any section may be readily taught to carry out the simple functions necessary for the procuring of road materials ; and as they are to be benefited by the construction of the roads it only seems reasonable that they should be called upon to do the greater part of the road construction as a tax or direct contribution to the Province or District to be benefited.

JOHN WELLS.

January, 1920.

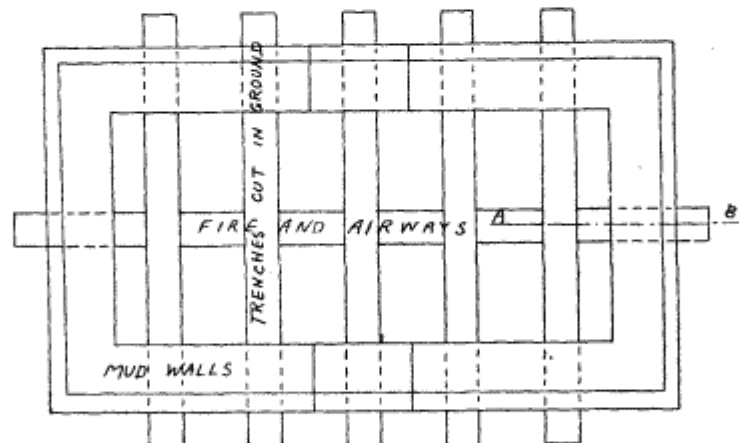


15 CTD KILN FOR "WELLS" SYSTEM

OF

ROAD CONSTRUCTION
ACROSS COTTON SOIL

FIRE CONTROL PORTS



FIRE CONTROL PORTS

15' x 7' x 4 FT HIGH

15 CTD "WELLS" KILN FOR "WELLS" SYSTEM
OF ROAD CONSTRUCTION

SCIENTIFIC RESEARCH COMMITTEE

Gas Poisoning In a Kordofan Well.

An unusual type of serious accident resulting in the death of three men occurred recently at Soderi near Bara. A quantity of "laot" bark (*Acacia nubica*, Benth) had been put at the bottom of a disused well, (which was about 20 feet deep and contained 3 feet of water), with the object of softening it before using for roofing. After a day or so, some men went to remove the bark, and the first who descended the well was seen to fall down almost immediately: a second who went down to his assistance did the same. A third man was then let down by means of a rope, collapsed at the bottom and was drawn up to the surface in a dying condition. The bodies of the other two were subsequently pulled up dead. The usual story of a disturbed and offended evil spirit was furnished by the local "fiki," but a further explanation may be offered in the light of a chemical examination of the water and "laot" samples which were sent to the chemical laboratories by Captain Soutar, the District Veterinary Officer, to whom I am indebted for the above details.

The water smelled strongly of sulphuretted hydrogen (sewer gas) and analysis showed that it contained about one tenth of the amount required for saturation: this would mean that the air immediately above the water (in a confined space) would contain 10 per cent of the gas and this being about 100 times as concentrated as living animals can stand, is sufficient explanation of the rapid deaths of the three men.

Cases of this sort are on record where work is being carried on in the places close to chemical factories—such an accident took place in 1902 at Hebburn-on-Tyne where a graving dock was being constructed, and some old alkali waste (containing sodium sulphide) which easily gives rise to sulphuretted hydrogen) had accumulated in the excavation. Three workmen lost their lives in this accident. Other cases of poisoning by sulphuretted hydrogen have taken place in sewers, the origin of the gas here being the putrefaction of animal matter.

In the present case the origin of the gas is quite different and appears certainly due to the interaction of the bark and the water. Experiments showed that the bark soaked in distilled water produced minute traces of the gas but in quantity entirely insufficient to account for that found in the well water.

A more detailed analysis of the water showed, however, that it contained a considerable quantity (2 per cent) of sodium sulphate—quite a common constituent of Kordofan well waters—and when the bark was soaked in such a solution artificially prepared in the laboratory, sulphuretted hydrogen was produced in large quantity. The change from sodium sulphate to sodium sulphide (which as stated above easily yields sulphuretted hydrogen) can only be brought about in the presence of water by a few organisms of which the bacterium *spirillum desulphuricans* is the most common. This organism is said to be present in sea water, in river mud, and to infest many plants in company with others which lead to the decomposition of vegetable matter left in water. The organism must be a fairly hardy one, as it had been on the bark in a dried condition for some time before reaching the laboratory. It did not survive treatment with boiling water, and no reaction was obtained after it had been boiled with the sulphate solution and then kept for some days: this treatment is, however, equivalent to sterilising the bark.

Accidents of this nature are not likely to be common, as sulphuretted hydrogen has such a strong and unpleasant smell that its presence is immediately betrayed. It is, however, a very active poison and the proportion in the air required to cause death is far too small to be detected by such a test as a lighted candle. An animal let down is the safest test in all such cases: as a special test for this particular gas, a piece of blotting paper soaked in a solution of sugar of lead acetate or nitrate of silver may be used, as quite small quantities of sulphuretted hydrogen cause the paper to turn brown or black.

A. F. JOSEPH,
Government Chemist.

Experiments on Wheat Growing.

The following is an abstract of a bulletin ⁽¹⁾ published in May by Captain F. J. Martin and Mr. R. E. Massey describing experiments on the growing of native and imported wheats grown at Shambat

⁽¹⁾ *Experiments on Wheat Growing in the Sudan by F. J. Martin and R. E. Massey. Copies can be obtained on application to the Government Chemist, Khartoum.*

during the season 1919—1920. The general plan of the experiments was designed to answer the following questions :—

- (a) whether any of the commercial grains imported were superior in quality to the native grown wheats and at the same time at least equal in yield of grain and straw.
- (b) whether any variety, indigenous or otherwise, is suitable without further selection for distribution as seed to the native cultivators.
- (c) whether the climate of the Sudan had any effect on the quality of grain, and the period of growth.
- (d) whether the cultivation of any of the imported varieties in the Sudan resulted in accentuating some particular characteristic which would render it valuable as a parent plant for hybridising with other varieties.

During the course of these trials varieties were imported from many countries including England, France, Italy, South Russia, United States, Egypt, India and Australia, but only those from the three last named appear promising. This is probably due to the fact that the wheat season in the Sudan is only of short duration, and those varieties which do not mature quickly are not suitable.

The experiment consisted of growing each of the various types chosen on a one feddan plot at Shambat; in all cases the irrigation water was put at the rate of 500 cubic metres per feddan (equivalent to a depth of 4 $\frac{1}{4}$ ") about every ten days during the early stages of growth, and at longer intervals later on in the season, less water being given as the wheat began to ripen.

Six Australian, five Indian, two Egyptian, and two native wheats were used for final experiments; careful observations of the characters of the wheats in the field, the yields, and the chemical properties and baking qualities of the flours were made and expert opinion obtained in England as to their general appearance. The average yields of the best varieties were as follows :—

Imported Varieties.	Average yields per feddan in ardebs.
Firbank	4.7 ⁽¹⁾
Federation	4.6
Indian No. 40	4.2
Thew	4.2

(1) One ardeb of 420 lbs. per feddan equals 7 $\frac{1}{2}$ bushels per acre.

Indigenous Varieties :—

White Dongolawi	3.3
Red " 	3.3

Of the fifteen varieties tried, the six Australian and four out of the five Indian showed no susceptibility to rust, the remaining types all showing themselves more or less susceptible.

The Australian types "Federation" and "Firbank" and the Indian No. 40 showed marked superiority not only in yield but in quality of grain over the indigenous varieties and the authors consider these three as most suitable for distribution to native cultivators.

It is noted that the effect of the Sudan climate is to shorten the growing period, this being particularly the case with the Australian varieties.

NOTICE OF PUBLICATIONS.

The following Scientific papers and Notes have appeared recently on subjects of interest in this Country :—

1. Report of the Sudan Government Chemist for 1920.
2. "Experiments of wheat growing in the Sudan", Chemical Section Bull. No. 19. F. J. Martin and R. E. Massey.
3. "A Note on the Maintenance of Quality of Cotton Grown in the Sudan". Sudan Notes and Records Vol. IV, No. 1. April 1921. P. 44, R.E. Massey.
4. A Beehive designed for the Production of Beeswax suitable for use by natives of the Southern Sudan.— Ent. Sec. Bull. No. 11. Pub. in English, October 1920, H. H. King.
5. The Migratory Locust (*Schistocerca gregaria*, Oliver). Ent. Sec. Bull. No. 12. Pub. in English—July 1921, H. H. King.
6. Rats and Mice. Ent. Sec. Bull. No. 13. Pub. in English—July 1921, H. H. King.
7. Hyenas. Ent. Sec. Bull. No. 14. Pub. in English—July 1921—H. H. King.
8. The Locust. Ent. Sec. Bull. No. 15. Pub. in English and Arabic—July 1921, H. H. King.
9. The Fowl Tick. Ent. Sec. Bull. No. 16. Pub. in English—July 1921, H. H. King.
10. "Ruff Feeding upon Grain" (at Medani) British Birds, Vol. XV, No. 1. June 1st 1921. pp. 21—22, J. E. M. Mellor.
11. "Some Factors in Thermal Sanitation in the Tropics", Journal of Hygiene, XIX. 1921. p. 235, G. W. Grabham.
12. "Notes on Four Sudan Solitary Wasps", Sudan Notes and Records, VOL. IV, No. 2. July 1921, pp. 87—105 and 11 Figs. J. E. M. Mellor.

CORRESPONDENCE.

Khartoum, 29. 5. 21.

The Editor,
Sudan Notes and Records,
Khartoum.

DEAR SIR,

A somewhat unusual lapse from accuracy will be found on page 214 of Professor Wallis Budge's "The Egyptian Sudan".

From the text it would appear that Ahmed Pasha Abu Udan was guilty of the atrocities described on pages 198—200 of "Letters from Egypt, Ethiopia and Sinai" published in London in 1858 (Lepsius).

Lepsius' letter is dated the Pyramids of Meroe 22nd April 1844 and as he met the Turkish army on 9th April (page 198) it is obvious that the "Ahmed Pasha" alluded to is not Abu Udan, as Ahmed Pasha Abu Udan died in September 1843 at Khartoum.

The incidents described occurred during the régime of Ahmed Pasha El Menikli who arrived in Khartoum in December 1843 and proceeded to Kassala in January 1844.

The list of Governor Generals of the Sudan and the chronology on pages 213—222 are neither of them correct or supported by contemporary European travellers. It is believed that they have been obtained from Egyptian or other similar sources.

Yours faithfully,
(Sgd.) A. E. ROBINSON.

The Azande.

DEAR SIR,

On page 57 of the April number Professor Crabtree suggests the connection between the Zande nickname Nyam Nyam and the Bantu word Nyama meaning (1) wild beast (2) meat. With the former meaning the word Nyama is very frequently used in Western Mongalla and the Southern Bahr El Ghazal Provinces as an opprobrious epithet when a man desires to be abusive and thoroughly insulting to

another. The expression on the face of the user and the vicious manner in which he raps the word out, with the emphasis on the first syllable, leave the onlooker in no doubt as to what he thinks of the offender. In this area the word in this form does not owe its origin to any old established local language but to the recently introduced language of the Ba-Ngala, which is daily becoming more widely used as the language of common intercourse in the six districts along the Congo Nile divide from Kajo-Kaji to Tembura.

The theory that the nickname Nyam Nyam is onomatopoeic and represents the sound made by the Azande gnashing their teeth is quite untenable. No amount of gnashing of one's teeth will cause any sound remotely resembling Nyam Nyam to issue from one's lips. Moreover no one who has been in contact with the Azande has ever made the observation that they gnash their teeth, either in anger or when masticating, in a way to distinguish them from any other black race. The only noises I ever heard them make when eating were the loud sucking noises characteristic of all primitive people and the lower orders of more highly civilized ones. ("Let's dine at the Carlton and listen to the financiers eating soup"). A nick name founded on such an undistinguishing characteristic would be feeble and pointless and could not possibly explain the fierce resentment felt by the pure bred Zande when called Nyam Nyam. This theory can be dismissed together with the commonly held but totally erroneous idea that the Azande sharpen their incisor teeth to points, the better to tear the flesh from the bones of their victims !

The Azande are a fierce, warlike race with cannibal proclivities, and are greatly feared by their neighbours even at the present day. Like all black men they are grossly insulted if likened to wild beasts ; but in the case of the Azande the insult is even grosser, because they are inordinately proud of the position they imagine themselves to occupy in the scale of civilization on account of their superiority in tribal organization, crafts and pursuits to subject and neighbouring tribes. Amongst their neighbours were Bantu or semi-Bantu tribes, at least one of which, the Ba-Huma resident on the Congo Nile divide, they conquered and absorbed. We have already seen that the Bantu word Nyama meaning wild beast is used as a term of insult. With these facts before us is it any wonder that these terrible folk who were constantly fighting and organizing forays for the capture of human meat should have been nicknamed "the wild beast"? Moreover

the sting of truth, which is never absent from an African nickname, is more than sufficient to explain the fierce resentment felt by the pure bred Zande when called a Nyam Nyam. A few years ago it was as much as his life was worth for one of the A-uru (slaves; conquered tribes) to hurl this epithet at a Zande.

The fame or rather ill fame of the Azande we know spread far beyond the limits of the tribe centuries before there were any Arab geographers in Africa. Their singularly appropriate and adhesive nickname would naturally spread *pari passu* with their fame, passed on by the people who gave it to them to different tribes outside their sphere. It is then easy to understand why the Arabs encountered and recorded varying forms of the word; and also why they applied the term so loosely as to include the very people who coined the nickname for their natural enemies. It is to be noted that these Arabs always recorded the native form, whereas the modern Arab invariably talks of a Nyamnyamawi (pl. Nyamanyim).

The Dinkas got hold of the nickname in exactly the same way but living nearer the Azande did not confuse them with their subject and neighbouring tribes and to this day use the word Nyam Nyam exclusively to denote a Zande. They have different nicknames for all the tribes subject to the Azande. These subject tribes also use the word Nyam Nyam to denote Zande only.

It has been mentioned that a section of Bantu speaking Ba-Huma live now in subjection to the Azande on the Nile side of the Congo Nile divide. It would be interesting to know if they fled out of the Congo basin north over the divide just as the Oedio and Bongbei ("Makaraka" of Meridi and Yei Districts respectively) fled east over it, in order to escape the terrors of the Zande incursion. Wherever they came from they were eventually engulfed when the wave broke on the divide and swept in to the southern Bahr El Ghazal.

As regards Prof. Crabtree's final para. true palatalization of the word Lyam appears to occur in the Northern Bahr El Ghazal where I am informed by Captain T. W. Stallybrass the word cham cham, food, is commonly used by carriers.

(Sgd.) BASIL SPENCE.

SUDAN NOTES AND RECORDS

Volume IV.

No. 3.

NOTES ON THE NATURAL HISTORY OF JEBEL MARRA.

BY CAPTAIN LYNES R. N.

The following notes resulting from a visit paid by Mr. C. McConnel and myself in April 1920 to Jebel Marra are offered in continuation of the accounts published by Captain H. F. C. Hobbs and Mr. J. A. Gillan of their pioneer ascent of the crater of Dereiba in March 1918, papers which we found most useful and excellent. The object of our trip to Darfur was to study the natural history particularly of the great mass of mountains lying centrally in the province and at present indicated vaguely on our general maps of Africa by the name of Jebel Marra⁽¹⁾. Thanks to the kindness of the Sirdar, Colonel Savile the Governor of Darfur, of Mr. and Mrs. H. King at Khartoum, and of the many for whose help on the way we are deeply grateful, our whole trip was made easy, even luxurious, and we certainly ought to have

⁽¹⁾ *Observing that the word 'Jebel' is in general use as the nomenclatorial equivalent of our 'Mount.....' or '.....Peak', and that these great Central Mountains of Darfur collectively cover some 800 square miles with much of that area between 6000—10000 feet in altitude, the expression Jebel Marra seems to me unfortunately non-descriptive, even trivial. However on authority no less than that of MacMichael we find that the name has been used for the whole massif from time immemorial—so Jebel Marra or the Mountains of Marra they must remain. But I venture to express the hope that in our new maps of Africa the name will appear in distinctively larger type than is used for the ordinary 'Jebels' which are mostly mere dots by comparison.*

brought back a good account of the natural history, had not my companion unfortunately been recalled by home affairs just as we had reached and settled down in the upper zone of the mountains. Brief though our stay was, it was long enough to perceive that the natural treasury of these mountains is considerable, and the specimens of birds, plants and even rocks that have recently been worked out at the British Museum, have fully justified that estimate, so it is with pleasurable anticipation that Mr. Willoughby Lowe and I look forward to a more prolonged stay in the mountains during the present year.

McConnel and I followed in the footsteps of Hobbs and Gillan making the ascent from Kallokitting which we reached from El Fasher on 21. March. After three days at Kallokitting we left for Dereiba with a string of little donkeys recruited for us by the Shartai Ali Abd el Khalil. This old chieftain's genuine pleasure when we arrived and presented the Governor's letter, and his anxiety to do everything he could to please Savile Pasha struck us as a very sterling tribute to the success of British rule in so recently administered and remote a part of our Empire. The Shartai's daily gifts of food were on as magnificent a scale as the scarlet robes in which he first received us; we soon became very friendly and had the pleasure of curing his rheumatic leg by a vigorous application of capsicum vaseline, with perhaps the addition of a little faith on his part.

The vicissitudes of the ascent have been well described by Hobbs and Gillan; our experiences quite tallied with theirs. We expected to be up in the mountains for several weeks, and what with collecting gear and the usual excess of things one generally feels unable to do without when plunging into the unknown—our impedimenta were considerable. The middle zone (see page 131) rises in terraces, whose exceedingly abrupt edges often front the line of advance; here it was necessary to unload many of the larger packs and pass them up to the next terrace by hand; there the donkeys themselves had to be literally hoisted up for the last few nearly vertical feet. The passages between the boulders on the slopes were often too narrow for the donkeys to pass with their packs on either side, and the precious bird box which was only made of three-ply wood had finally to be balanced centrally on top of a donkey's back to save it from being stove in. So our progress was slow, but tant mieux when every step up brought something new, whether bird, plant or rock and widened the glorious panorama that lay between us and the southern horizon. Our fourth

'shid' brought us to Babrei and the fifth to Dereiba village where we stopped for two nights and a day (6th April).

The villagers treated our arrival on the scene with extraordinary unconcern, I think in no way from fear or dislike, and certainly from no feelings of consideration for us. Had it been a Chinese village anywhere off the beaten track we should not have had a moment's peace from those dreadfully inquisitive 'nās'. Reflecting on the fact that we must have been only about the fourth lot of Europeans those people can have ever seen, I cannot recall having met in my naval voyages such remarkable apathy on the part of 'natives'; even the canoe Indians in the Magellan Straits, Darwin's least intelligent of mankind, took a little interest in what they saw aboard our ships. These Furs of the Mountains are certainly, as noted by Hobbs and Gillan, of low mental development, but I am not at all sure that the latter quality is necessarily correlative with apathy of this sort: from Wallace's remarks in this connection on the Papuans and Malays it seems largely a matter of temperament. The mountain people gave the impression of being ethnically distinct from those of the foot hills as at Kallokitting; and if their physique is poor, their lungs as typified by the two men who scrambled up the 9500 ft. peak with me are magnificent.

We spent from the 7th to 10th of April encamped in the crater, three days fully occupied in collecting in various departments, including a climb or tooth and claw scramble up to the top of the very steep sided peak marked 6000 feet on Hobbs's map, to the N.N.W. of the 'fresh' lake. The return journey which included half a day and a night by a cascade deep down among the cliffs at the source of the Wadi Gindi, occupied three days and on 19th April we reluctantly bade good bye to Jebel Marra and turned our faces homewards.

Such topographical observations as we were able to make, fitted in well with the Hobbs and Gillan maps, our altitude records, too, confirm their doubts as to the accuracy of the recorded heights which we made considerably greater; an experience, Colonel Pearson tells me, confirmed by the recent surveys of Messrs. Boyce and Carson. Thus we made:

(a)	Kallokitting village	=	4400 ft.	above sea level
(b)	Babrei	"	=	7100 ft. " " "
(c)	Dereiba	"	=	7900 ft. " " "
(d)	Surface of salt lake	=	7400 ft.	" " "

- (e) Peak at N.W. corner
of crater (marked
6000 ft. on Capt.
Hobbs' map) = 9500 ft. above sea level
- (f) Hobbs-Gillan Peak
(original "J e b e l
Marra") = 10000 ft. " " "
- (g) Peak C (highest of
Crater rim) = 10100 ft. " " "
- (h) J e b e l N i u r n y a
69½°, 15—20 miles = 10590 ft. " " "
- (f) (g) (h) heights only estimated from Peak (e).

I do not think the maximum error in the observed heights is more than 200 ft. Our altimeters worked quite consistently, but one can scarcely expect much less than a 3% error from a pocket instrument even if one gauges as many as possible of the "variables."

The Crater.

From so brief an inspection by two neophytes in Geology, to do more than suggest the main outlines of Nature's evolution of the Crater would be rash indeed, but Mr. Campbell-Smith of the Geological Department of the British Museum to whom I submitted my rock specimens, photos and notes, has done wonders with our amateur efforts and the following main outlines are, I believe, somewhere near the truth.

a. The main mass of the mountain, through which in bygone days the volcano burst, is entirely igneous in origin; its character is well shown by the great vertical walls at the Crater gap or entrance, and those rocks inside the Crater which by reason of their 'verticality' still have exposed surfaces. These, as well as many of the boulders and stones found perched on top of the rim itself, which may owe their presence there to the earliest explosions of the volcano, are "quartz bearing trachytes" allied to those found in the Abyssinian Mts. and the Great Rift Valley. They are clearly recognizable by their fine grained appearance, hardness (scratches copper) and grey blue to grey green colour, when the reddish ochre weathered surface is chipped off. Another conspicuous rock illustrating the igneous constitution of the mountain is found in the water course bottoms—mostly large slabs, pale indigo blue in colour, and worn smooth by water action. This is

"mugearite" in some respects resembling those from the Isle of Skye, E. Lothian and Pembrokeshire, (volcanic series), but poorer in olivine and magnetites, and richer in augite etc. Gneisses and quartz fusions are of frequent occurrence.

b. The main 'Crater' is undoubtedly the crater of an extinct volcano. Within it as may be expected, all rock save the upper walls (which are now worn clean of it) and the perpendicular, is covered deep with lava and tufts, from banks of white pumice whose edges break into dust on the least touch, to hard angular boulders and fragments, all shades of reds, ochres and browns, reminding one of clinkers from a brick oven. 'Pumice stones' lie strewn all over the floor—in the strand of the Salt lake there are enough, nicely rounded and ready for use, to supply all the Chemists' shops in London, by the look of it. The pumice 'banks' which form the main wall lining, as it were, abut on the floor in endless fantasy of form and furrow due to the action of rain; white, glaring and arid, their appearance reminded me of some of the worst parts of the South Sicilian coast in midsummer.

c. The 'salt lake' is the puddle (sic) that collects in the lowest parts of the main crater floor.

d. The 'fresh lake' is the water-filled crater of a small volcano formed by an eruption that occurred inside the main crater (long ?) after the latter had become quiescent or extinct.

(c. and d. suggest themselves forcibly when one gets a general view from a good height overlooking the whole crater, as from the N.N.W. Peak.)

e. The water of the two lakes is found to contain the following in solution (1) :

	"Salt Lake"	"Fresh Lake"
Chlorides (as Sodium Chloride)	1.6%	.17%
Alkalinity (as Sodium Carbonate)	3.4%	.30%
Other solids	A tiny quantity only.	

It will thus be seen that the two lakes differ practically only in the quantity of impurities, the net economic result being that the "fresh"

(1) *For these details I am indebted to Major R. G. Archibald of the Wellcome Research Laboratories Khartoum, who has been good enough to give me the analyses of the water samples which we brought back from the Crater and other places.*

lake water, though not nice, is drinkable (slightly better if taken from a scoop hole a few yards from its edge), and that of the salt lake is offensive even to its smell.

At the "fresh" lake besides the fringe of soft spike rushes and rotten plants round the edge frequented by occasional dickybirds, dragonflies and insects, the only (obvious) signs of life we ever noted were three or four dabchicks (probably *P. capensis* a wide ranging bird in Africa) on its surface, and the only living creatures that we could grub up from the steep slopes of its basin were dragonfly larvae; but we had no proper dredge and we were unable to shoot one of the dabchicks to see what they were eating. Here save for the occasional whinneying cry of a kite or the croak of a fantailed raven high overhead, silence reigns supreme; a half-buried "haunted" spot; small wonder a subject of romance and legend among the uncultured Furs.

At the "salt" lake a party of some eight stills, winterers from Europe, seemed to have quartered themselves in the unsavoury shallows; their food consisted of mason-wasps whose dead carcasses abounded on the lee strand. A brown-coloured duck of sorts who thought it more healthy not to stay and be diagnosed, and two crowned cranes were the only other feathered inhabitants we ever saw at the lake, and other life either on or beneath its waters seemed non-existent, not even brine-shrimps rewarded our dredging operations.

Hobbs and Gillan remarked on the apparent constancy of the water level in both these lakes: we also were confronted by the fact in the shape of the narrowest little "low-tide" strip at this very end of the dry season. Now it is evident from this that the lakes cannot depend directly on the annual rains for their water supply; there must be a perennial influx almost equal to or greater than the enormous evaporation. Even if no surface water were perceptible in the crater above lake level, it seems only natural to expect perennial water channels beneath the surface at a level of 1500—2000 feet below the mean level of its rim—but as a matter of fact there are evidences of surface water in the main crater walls about 100 feet above lake level. These consist of slow drippings, oozing out of the rock crannies, they support a slender growth of maidenhair fern and other such troglodyte plants, and their presence is disclosed by the continuous throngs of small birds chiefly rock buntings, serin finches, and silverbill weavers, moist-

ening their throats; curiously, it seemed to me, in preference to having a good square drink at or a bathe in the "fresh" lake.

I took the lake levels on several occasions and although my altimeter always made the "fresh" lake about 30 feet higher than the "salt," was at first inclined to dismiss the difference as the instrument's personal error; it was an easy way out of the difficulty, now however I believe that the observations were quite likely correct. Briefly my theory is that each lake has its own basin equally as independent of the other as the original formation of the two lakes certainly was: that the water is in both cases derived directly from subterranean sources, that the two basins are porous in a high degree at about one foot above dry season water level, and that the small rise and fall undoubtedly existing is due to the excess of water, both surface and subterranean, which for a comparatively brief period only, viz. during and just after the annual rains, slightly raises the respective heights of the overflow. The countless water scorings in the pumice "tuff" slopes lining the crater walls, all draining into an extensive system of water courses and so into the "salt" lake at the lowest part of the floor; the grass and herbage on the greater part of the floor growing in wave or ripple formation indicative of temporary surface submergence, and any amount of other evidence, all show what immense quantities of rain water must feed the salt lake during the rains, and yet it is no better off in the end than the fresh lake whose abruptly sloped, containing structure can only supply it with a comparative teaspoon full of rain water at the same period. No—the surface water supply can be but a passing incident in the life of both these lakes.

The numerous evidences of domestic beasts about the floor of the water suggested a friendly aspect of the "local deities," we thought—no flocks and herds were there during our visit, but the vegetation was rather dry and parched and we gathered that the favourite grazing season there was over.

The defile by which one approaches the crater is the source of the Wadi Gindi which eventually passes just below Kallokitting; at this season and probably nearly all the year round the water gushes out in delicious purity at the significant altitude of 7400 feet or lake level. Here, embowered in willows, figs and other shady trees whose luxuriant foliage evidently concealed numbers of birds, plashed a 10 feet cascade which looked so delightful that we spent a day there—

and a very profitable day it was too. But such jungles demand not days but weeks of careful study before they will deliver up all their treasures, of birds alone there were numerous kinds we could not possibly identify either by their notes or by the momentary glimpses they afforded while flitting through the jungle.

Biologic.

At this their southern end the main biologic features of the Marra Mountains seem to group themselves conveniently into three zones of altitude viz.

1. Upper zone—from about 7500 feet upwards.
2. Lower zone—from their base immediately south of Kallokitting (i.e. from about 4000 feet up to about 5200 feet.
3. Middle zone—between the two former.

The Upper Zone.

Of these three zones the Upper presents to the naturalist by far the greatest interest; for here in a biologic sense altitude begins pointedly to take him out of tropical Africa into more temperate regions; each fresh plant or creature is in all probability not merely a taxonomic incident, to be collected because it may be new or rare or beautiful, or just material for the study of the life history of its kind, but a subject for the study of such wider problems of Nature as dispersal, change due to environment and all those big ideas, maybe only speculations, that minds like those of Darwin, Wallace, Hooker and others have presented to us in a variety of fascinating forms.

On reaching the Upper zone even the most casual observer cannot help being struck with the change in plant life. At 7500 feet the hard thorny or prickly type so terribly ubiquitous in the North and Central Sudan plain practically vanishes; bracken, ferns, soft grasses and rock-plants, many of S. European genera, commence to form the tapis, trees become comparatively scarce, but the haráz,⁽³⁾ though hard pressed as the fire wood provider, still holds its own, and fig bushes of European appearance bearing small edible figs (unripe in April) are abundant both "wild" and as apparently "grown" around the terraced cultivation. At 8000 feet provided that the soil has some constituents to enrich the fields of pumice leading to the crater, the temperate plants have increased in number and variety; the last of the thorny trees disappears and gives place to an olive,⁽⁴⁾ very like

the wild olive (the "acebuche") of Andalusia, which seems to constitute the sole representative of arboreal life above 8500 feet, unless it be for an occasional fig that has found a favourable nook for itself. At this height in places where the soil appears to be a mixture of soft gneissic and volcanic elements, one may stand thigh deep in bracken and purple *Lavandula*,⁽⁵⁾ in form, colour and "vinaigre" scent almost identical with that of the Mediterranean; patches of a Heath,^(5a) recalling the moister "ouieds" of Malta, clothe the soft rock and even at this season please the eye, though but the russet calices and a few dry patches remain of their inflorescence; a few Milkworts,⁽⁶⁾ small *Campanulas*,⁽⁷⁾ *Toadflax*,⁽⁸⁾ *Lobelias*,⁽⁹⁾ and *Composites*,⁽¹⁰⁾ are even now flowering among the undergrowth; add one or two of the gnarled olive trees and a flock of goats (both supplied locally), a suitable figure with a musical pipe (preferably from exotic sources), imagine the giant Umbellifer stalks to be flowering asphodels, and verily we shall have completed our picture of Classic Arcadia. Perhaps in the autumn an even more delightful one, for at this most arid time of the year, when all vegetation dries up save that which can burrow or cling to moisture, or use the shade and protection of sturdier brethren, our picture can be but the mere skeleton of that which the Rains will clothe with life and vigour.

Animal life though apparently sparse, with so distinct a type of environment, is sure to be peculiar and interesting. Of mammals we can say nothing except that we saw a "Hunting Dog"⁽¹¹⁾ and a small Rat at close quarters, and up to 8000 feet the Dogfaced Baboon,⁽¹²⁾ which abounds lower down.

Of birds however we saw several kinds not found below the Upper Zone, or if so only sporadically.

1. A Stonechat,⁽¹³⁾ a new racial (or geographical) form of our British species and very like our bird to outward appearance, but blacker on the back. A study of the minutiae which constitute the racial characteristics, show that the Jebel Marra bird is most nearly allied to the stonechat which breeds in Persia and winters in N. E. Africa including the Eastern Sudan, and curiously enough also to one which is resident in Madagascar. Our bird was abundant and on the point of nesting, it is certain to be resident all the year round at Jebel Marra and gives us the first record of a stonechat breeding in the Sudan.

2. A black Wheatear,⁽¹⁴⁾ so far as we can find from careful comparison identical with the species so common at Assuan etc. and extending south to Merowe and the Red Sea Province. A. L. Butler (Ibis 1908 p. 235) put the southern limit of this species at between 18° and 19° N. lat. and it has not been recorded any distance to westward of the Nile, so it is curious to find it on top of Jebel Marra, apparently unchanged in form, where it is sure to be resident all the year round. It is a regular "chat"—like bird between thrush and robin size, black with the usual wheatear pattern of conspicuous white in the tail—and just as with the Nile bird about 50% have the crown of the head pure white instead of black.

3. A Rock bunting,⁽¹⁵⁾ a new race of the species found from the Red Sea Province to Khartoum. A dark looking bird about sparrow size, head neck and chest ash grey, much streaked with black; body dark brown and chestnut in the usual bunting streak pattern; in flight the wings look mostly chestnut. May be found also in the higher part of the Middle Zone, but the Upper is their headquarters, they swarm in the Crater.

4. A Crested Lark,⁽¹⁶⁾ a *brown* crested lark conspicuously different from the light sandy coloured bird that cheers the traveller by the road side across the Darfur plain up to Fasher and beyond. Whether it is a *new* race or not we cannot yet say—crested larks notably vary much in colour according to soil and vegetation, and their diagnosis is fraught with many pitfalls, however the Jebel Marra specimens are now in the hands of Dr. Harbert, our greatest authority on Crested larks—so especially if after the next rains we can add some specimens in quite fresh plumage we are sure to know soon.

These four birds, peculiar (so far as is at present known) to the Jebel Marra highlands, are all abundant there, and with a few other cosmopolites like the Black kite,⁽¹⁷⁾ Fantailed raven,⁽¹⁸⁾ Serin finches,⁽¹⁹⁾ Silverbill weavers,⁽²⁰⁾ Crag martins,⁽²¹⁾ and wintering Wheatears,⁽²²⁾ from Europe, form the dominant types of bird life high up. The Bulbul,⁽²³⁾ Stone-bantam,⁽²⁴⁾ Guinea fowl,⁽²⁵⁾ Francolin,⁽²⁶⁾ Rockpiper,⁽²⁷⁾ and a few other species common enough lower down, were sparsely represented, but practically all outsiders dropped out above 8000 feet. It should be noted that during the summer the bird population, except for the residents and specials, may be considerably different, just as is the case at home.

Somewhere about 8000 feet and not below a marked fall in tempera-

ture at night appears liable to occur: from normal minima of 55° — 60° during our visit one night the thermometer registered 32° . The night was still and clear, but we detected nothing to mark the meteorological conditions as differing essentially from those of some of our other nights up there. Wind, by raising dust and preventing radiation at night, certainly accounted for one or two warmer nights we had.

To do it full justice the Upper Zone requires a thorough exploration at different seasons of the year, every fact and specimen collected there will be of sure value, and we hope to be able to contribute somewhat towards this end during the present year.

The Lower Zone.

If to the naturalist the Upper Zone presents the greater interest, the Lower Zone, as around Kallokitting with its fine shady trees, swampy flats and open water pools, is certainly the richer field for the collector. Here, if like us he comes from the North and Eastward, he will find for the first time a number of Southern and West tropical forms of life. To begin with—plant life here assumes a richer and more varied character, some hitherto constant wayside companions like the Tundub,⁽²⁸⁾ Mokeit,⁽²⁹⁾ Sodom apple,⁽³⁰⁾ etc. drop out or become comparatively scarce, and are replaced in greater abundance of kinds by lovely flowering trees like the Boswellia,⁽³¹⁾ the Lonchocarpus,⁽³²⁾ which flowers leafless in a cloud of delicate pink blossom that remind of Japan in the almond blossom time, Eugenia,⁽³³⁾ and others, while in the swampy parts and around the irrigated gardens moist-loving plants, naturally hitherto absent, like Mint,⁽³⁴⁾ Brooklime, Willow-herb,⁽³⁵⁾ Buttercup,⁽³⁶⁾ etc. strike a note of English brook-side life. Heskanit,⁽³⁷⁾ (grâce à Dieu) disappears, but although a softer tone begins to appear in the armoury of the vegetation, the Lower Zone is by no means free from those terrible plants of the plains, whose struggle for existence clothes them with thorns in endless form of hook and spike, or who seize on the passer by, man or beast, to disperse their painful seeds; indeed Kadada,⁽³⁸⁾ and Nabak,⁽³⁹⁾ bush scrub is a very conspicuous feature of the lower flats.

Among mammals Baboons,⁽¹²⁾ and Grivet,⁽⁴⁰⁾ (like) monkeys are common, we saw the red Hussar monkey,⁽⁴¹⁾ and several grey-brown Duikers,⁽⁴²⁾ rufifrons gazelle appears only just occasionally to enter the foot hills, a family party of lions drinking at the Kallokitting swamps

one evening gave me a splendid view from a cliff above them at twenty yards range, and evidence of "small beasties" about the place was plentiful if somewhat local.

Bird life, even though the general breeding season is certainly later in the year, was abundant. Guinea fowl,⁽²⁵⁾ Francolin,⁽²⁶⁾ and Stone-bantam,⁽²⁴⁾ swarmed, the four-banded Sandgrouse,⁽⁴³⁾ was commonly preparing to breed and a few pintailed sandgrouse,⁽⁴⁴⁾ used to drink in the morning instead of in the evening like their much more numerous congener. Among Southern and Western forms, either poorly represented further North and East or newly met with and conspicuous in the Lower Zone, may be mentioned the Green pigeon,⁽⁴⁵⁾ Grey Plantain eater,⁽⁴⁶⁾ whose noisy gobblings rent the air as April advanced, the blackbird-sized Rollet's barbet,⁽⁴⁷⁾ black, white and scarlet with a big ivory-like bill and black beard, the tiny Orange capped barbet,⁽⁴⁸⁾ who had already commenced to breed, the White-eye,⁽⁴⁹⁾ Yellow-bellied Eremometa,⁽⁵⁰⁾ Honey-guide,⁽⁵¹⁾ Acik sunbird,⁽⁵²⁾ (black with scarlet breast and long curved bill), Puff backed bush-shrike,⁽⁵³⁾ Swamp Coucal,⁽⁵⁴⁾ and a number of others; while additional "Lower Zone character" was added by the dropping out or reduction to comparative scarcity (except in the very lowest of its flats) of such friends of the plains as the Spreo glossy starling,⁽⁵⁵⁾ the Courser,⁽⁵⁶⁾ the noisy Red-wattled lapwing,⁽⁵⁷⁾ the little Finch-larks,⁽⁵⁸⁾ Acacia Babbler,⁽⁵⁹⁾ longtailed Green Bee-eater,⁽⁶⁰⁾ Lark—quail,⁽⁶¹⁾ and others.

Insects became rather more plentiful as the temperature increased, but no mosquitoes except a few at the open water morning and evening. The worst pest was the tiny "Melipona" bee mentioned by A. L. Butler (Ibis 1908 p. 210) as a pest in Bahr al-Ghazal Province, which especially on hill tops swarmed all over one's face to get moisture. White ants remain plentiful and the large white, redbrown striped laced-shell of the plains is still to be found among the hills of the lower zone, but I think neither enter the Middle Zone.

So far as our information went all visible rock formation throughout the Lower Zone are of igneous origin; granitic rocks and gneisses, trap and scoria, volcanic tuff and pumice washed down from higher up etc; we found no sedimentary rock at all in Jebel Marra.

The Middle Zone.

In a really large mountain system, like for instance the Himalayas, where a "middle zone" extends over many miles and through some six to eight thousand feet of altitude, there is little difficulty in defining its chief characteristics, but here we are confronted by a middle zone of very narrow compass and a knowledge of its features confined to two quick journeys through it, so that we do not yet possess much material for a satisfactory definition. Perhaps it may be found better to leave it merely as a neutral ground whose life is a composition of that below and above it, and as such unworthy of a special name; but although doubtless much of its character will depend on minutiae, I think that with greater familiarity the name will eventually be found justifiable.

To begin with, on the way up to the Crater soon after leaving the Lower Zone, one crosses the Wadi Gindi at a swampy basin or 'flat', and thenceforth to the Upper Zone extends a series of large trap-covered terraces which provide a soil markedly different in character to that of the rounded granitic, gneiss and quartz hills hitherto met with, and the vegetation in consequence has a different character. In general the thorny type, instead of predominating, becomes the exception, trees and bushes with large, broad leaves are plentiful, but smaller in size and numerically less. As we did scarcely any collecting there and can give no names, it is useless to attempt detail, but I think the above general statement will be endorsed by any visitor, and a botanist would have no difficulty in distinguishing a number of plants which either predominate in, or are not found, outside the Middle Zone.

Similarly with animal life great singularity must not be expected. There is much petering out in this zone of birds that abound in the Lower, and since this is much less so with those of the Upper Zone the bird life will be voted poor. A Rock-pipit,⁽²⁷⁾ however of a race peculiar (as far as known at present) to Jebel Marra, has its headquarters in the Middle zone where it abounds; a large dark brown pipit with a very dark tail, nearest in the Sudan to the much greyer lighter coloured bird that frequents the more stony, less bushed hill sides of Erkowit.

General.

Let us now pass from the particular and take a look at Jebel Marra's position on the map of Africa. To begin with the mountains lie

wholly within that 200—400 mile wide belt of bush that stretches right across the Continent on the mean of about the 13th parallel of North Latitude. A circle described with centre Jebel Marra and radius about 1100 miles will have on its circumference Cairo, the Straits of Perim, Nairobi and Fernando Po, and within this great area we find mountains of 8000—10000 feet or more i.e. comparable with or higher than Jebel Marra only in the following parts :—

To the Northward Mts. of Tibesti (Sahara)	600 miles from Jebel Marra
„ „ Southward Mts. of Equatoria	900 „ „ „ „
„ „ Eastward Abyssinian Plateau Mts.	700 „ „ „ „
„ „ Westward Cameroon and highest Nigerian Mts.	900 „ „ „ „

The high altitudes of these mountains almost certainly differ very much from one another in mean annual rainfall (their bases of course are known to do so enormously), but perhaps do not differ very greatly in mean annual temperature. Isolated though they be, the fauna and flora of all (except Tibesti which is still doubtful) are known to contain remarkable examples of affinity with those of (often widely different) portions of the North Temperate Zone, and we now have to find out in this respect what are the relationships of Jebel Marra.

So far as we can see as present, and our conclusions are mainly drawn from birds (not by any means always the best class for illustrating geographical distributions), the affinities of Jebel Marra's Upper Zone are most with Abyssinia, not at all with the Cameroons or the mountains of Equatoria. Among plants this is strikingly upheld by the *Aloe* 63 (red hot poker) which like its Abyssinian cousin has the habit I believe unique or quite exceptional among *Aloes*, of commencing to flower from the bottom of its spike causing it to have a bushy-like appearance in late life, instead of the normal spiked one, due to the upper (first flowering) petals withering and dropping off.

On the other hand the birds of the Lower Zone of Jebel Marra seem to show rather more affinity with the South and West than with the East, especially with those of the Shari river and Chad basin, whence Boyd-Alexander made good collections available for comparison at the British Museum. But much more material, in birds as well as other classes, is wanted before any satisfactory analysis can be made. Another point of interest is the question of bird migration. In autumn (and in spring the same, only in the reverse direction) the

Mediterranean is crossed by three very marked principal migration routes⁽¹⁾ viz.

Western Route. Crossing by Gibraltar following the West coasts of Europe and Africa.

Central Route. Crossing by Malta, fed from Sicily, Italy and probably Central European sources.

Eastern Route. Crossing by the Levant and especially down the Palestine coast, following the Nile valley and Red Sea to the South.

No one has yet discovered how the birds crossing by the Central route get to their winter quarters South of the Sahara, and one of the most reasonable suppositions has been that on reaching the African shore the route crosses the Sahara by oases and such a line of elevated country as Tibesti, Borku, Ennedi, Jebel Marra, as will sustain them on their journey, which the stark Sahara certainly cannot. But unfortunately for this idea, there is markedly no migration passage through Jebel Marra or Central Darfur. There are quite a number of *wintering* European birds there, who must arrive in autumn and stay the winter, and who drift imperceptibly away about the spring equinox, but their route hither and thence is utterly unknown. The new study of geographical races tells us that many of these birds must come from Eastern or S. E. Europe and S. W. Asia—very likely none from Western Europe; if the latter be the case a reasonable suggestion is that these individuals are deployments from the autumn contingent that follows the Eastern route, and return to their breeding quarters in spring the same way, but acquaintance with Jebel Marra⁽²⁾ so far appears no help towards solving the main problem of the Central Route.

In April and May we occasionally saw a few European Swallows who had certainly wintered further South, but they were only stray examples and likely enough had trouble ahead of them.

In conclusion I would ask readers to remember that much of my picture of Jebel Marra is necessarily derived from first impressions and that a *black* crow in certain lights may appear a *pied* one, so that I hope the Editor of Sudan Notes and Records will allow me in an

(1) *A migration route, it must be remembered, is not a line, but a great broad track—very many miles wide so far as we interpret it.*

(2) *Dr. Harbert had a similar experience with the oasis of Jnsaleh.*

issue after our 1921 expedition to publish such corrections as more mature experience may demand. My personal experience of the Sudan being confined to a five months trip in 1913—14 and the 1920 trip to Jebel Marra, I feel that some of the comparisons between Jebel Marra and the "Sudan Plain" may be thought out of proportion if not wrong ; in this therefore I beg the indulgence of those readers, beside whose experience of the Sudan mine is little more than that of a "week-end".

APPENDIX

containing the generic, specific or subspecific names of those animals and plants mentioned in the text which, from specimens brought home or other sources, are known to me. Sudan local names are placed in " " and spelt as in Broun's Catalogue of Sudan Flowering Plants 1906.

1. Bracken	<i>Pteris aquilina</i> L.
	<i>Adiantum Capillus veneris</i> L.
2. Ferns	<i>Dryopteris patens</i> Desv.
	<i>Pteris longifolia</i> L. and others.
3. "Haraz" (tree)	<i>Acacia albida</i> Del.
4. Olive (tree)	<i>Olea chrysophylla</i> Lam.
5. Lavandula	<i>Lavandula coronopifolia</i> Poir.
5a. Heath	<i>Blaeria spicata</i> Hochst.
6. Milkwort	<i>Polygala abyssinica</i> R. Br.
7. Campanula	<i>Campanula Schimperii</i> Vatke.
8. Toadflax	<i>Linaria aegyptiaca</i> Dum (forme).
9. Lobelia	<i>Lobelia</i> sp. Sect. <i>Hemipogon</i> .
	<i>Conyza</i> sp.
10. Composites	<i>Helichrysum abyssinicum</i> Sch. Bip. and others.

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| 11. Hunting dog | <i>Lycaon pictus</i> . |
| 12. Baboon | <i>Papio cynocephalus</i> . |
| 13. Jebel Marra stonechat | <i>Saxicola torquata jebelmarrae</i>
Lynes. |
| 14. Black wheatear | <i>Oenanthe leucopyga</i> Brehm. |
| 15. Jebel Marra rock bunting | <i>Emberiza striolata jebelmarrae</i>
Lynes. |
| 16. Crested lark | <i>Galerida cristata</i> ? race. |
| 17. Black kite | <i>Milvus migrans parasitus</i> Daudin. |
| 18. Fantail raven | <i>Rhinocorax rhipidura</i> Hartert. |
| 19. Serin finch | <i>Serinus mozambicus</i> near <i>aurifrons</i>
Sclater and Praed. |
| 20. Silverbill | <i>Aidemosyne cantans</i> near <i>cantans</i>
Gm. |
| 21. Crag martin | <i>Riparia fuligula</i> ? race |
| 22. Wheatear | <i>Oenanthe oe. oenanthe</i> (Linn). |
| 23. Bulbul | <i>Pycnonotus barbatus arsinoe</i> Licht. |
| 24. Stone bantam ⁽¹⁾ | <i>Ptilopachus fuscus</i> ? race. |
| 25. Guinea fowl | <i>Numida pt. ptilorhyncha</i> Less. |
| 26. Francolin | <i>Francolinus cl. Clappertoni</i> Childr. |

(1) *I confess this is a new English name, but I hope it may be found more acceptable than "Stone pheasant" for the common little brown game-fowl (or "cockyolly" of Sudan sportsmen), which is so bantamlike in appearance, and not a bit like a pheasant.*

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| 27. Jebel Marra rock pipit | <i>Anthus sordidus jebelmarrae</i> Lynes. |
| 28. "Tundub" (bush) | <i>Capparis aphylla</i> Roth. |
| 29. "Mokeit" (bush) | <i>Boscia senegalensis</i> Lam. |
| 30. Sodom apple | <i>Calotropis procera</i> Ait. |
| 31. Boswellia | <i>Boswellia papyrifera</i> A. Rich. |
| 32. Lonchocarpus | <i>Lonchocarpus laxiflorus</i> Guil. and
Perr. |
| 33. Eugenia | <i>Eugenia owariensis</i> P. Beauv. |
| 34. Mint | <i>Mentha silvestris</i> L. |
| 35. Willow herb | <i>Epilobium hirsutum</i> L. |
| 36. Buttercup | <i>Ranunculus pubescens</i> Thunb. |
| 37. "Heskanit" (grass) | <i>Pennisetum cenchroides</i> Rich. |
| 38. "Kadada" (bush) | <i>Dichrostachys nutans</i> Benth. |
| 39. "Nabak" (bush or tree) | <i>Zizyphus mucronata</i> Willd. |
| 40. Grivet (like) monkey | <i>Cereopithecus aethiops</i> ? race. |
| 41. Red Hussar monkey | <i>Cereopithecus patas</i> ? race. |
| 42. Duiker | <i>Cephalophus</i> ? <i>grimmii</i> . |
| 43. Four-banded sandgrouse | <i>Pterocles quadricinctus lowei</i> C.
Grant. |
| 44. Pintailed sandgrouse | <i>Pteroclorus senegalensis</i> Licht. |
| 45. Green pigeon | <i>Vinago waalia</i> (Gm.) |
| 46. Grey plantain-eater | <i>Crinifer zonura</i> (Rüpp). |
| 47. Rollet's barbet | <i>Iogonorhyncha rolleti</i> De Filippi. |
| 48. Orange-capped barbet | <i>Pogoniulus chrysoconus schubotzi</i>
Rehw. |

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|------------------------------|---|
| 49. White-eye | <i>Zosterops s. senegalensis</i> Bp. |
| 50. Yellow-bellied Eremometa | <i>Eremometa elegans</i> near <i>canescens</i>
Ant. |
| 51. Honey-guide | <i>Indicator minor?</i> <i>diadematus</i> Rupp. |
| 52. Acik sunbird | <i>Chalcomitra senegalensis acik</i> Hartmann. |
| 53. Puff-backed bush-shrike | <i>Dryoscopus gambensis malzacii</i>
(Heugl). |
| 54. Swamp coucal | <i>Centropus monachus fischeri</i> Rehw. |
| 55. Spree glossy-starling | <i>Spreo pulcher</i> (P. L. S. Mull). |
| 56. Courser | <i>Cursorius g. gallicus</i> Gm. |
| 57. Red-wattled lapwing | <i>Sarciophorus tectus</i> (Bodd). |
| 58. Finch-larks | <i>Pyrrhulauda frontalis</i>
<i>Pyrrhulauda leucotis</i> |
| 59. Acacia babbler | <i>Argya acaciae</i> (Licht.) |
| 60. Green bee-eater | <i>Merops lamark viridissimus</i>
Swains. |
| 61. Lark-quail | <i>Ortyxelus meiffreni</i> (Vieill). |

NATIVE GOLD WASHINGS IN THE NUBA MOUNTAINS PROVINCE.

BY S. C. DUNN.

For many years it has been known to the natives of the Northern Sudan and to European writers about the Sudan that gold existed in and was washed by the inhabitants in certain places among the hills of central and southern Kordofan.

In the order of the relative importance attached to them Tira Mandi, Sheibun, Tira Khadra, Lukha, Shwai and Tagale (Keraia) are the places most mentioned.

History.

The early history is entirely unknown. It is supposed by Mr. Ernest A. Floyer in a contribution to the Journal of the Royal Asiatic Society ("The Mines of the Northern Etbai", 1892) that the very early inhabitants of the mountains between the Nile and the Red Sea were a negroid race whose chief occupation was mining, and that this race was driven by Egyptian oppression towards Southern Kordofan. It seems certain⁽¹⁾ that the Nubas are the descendants of the people driven out of Dongola by the invasions of the Arabs from the north, and, since in Dongola there are many ancient gold mines, some on the river bank, some knowledge or tradition of mining would be preserved from such a source. Therefore in either or both cases, the original settlers of Dar Nuba probably possessed a knowledge of mining and of the value of gold. The discovery of deposits would not, I imagine, be the result of organised search, but purely accidental: either by the presence of a nugget on the surface or by digging one up during the simple processes of cultivation.

At Tira Mandi there are traces of surface workings dating back at

(1) *This is not now generally accepted weighty, authorities hold that the exodus of the Nubas from the river took place at a period considerably earlier than the Arab invasion. Cp. S.N.R. Vol. III. p. 288.*
[Ed.]

least 200 years, but how much earlier work started it is impossible to say. When Browne wrote his "Travels in Darfur" in 1788, he mentions Sheibun and Lukha as being sources of gold well known to the Arabs of Darfur. From that date Russegger and Ignatius Pallme, both about 1838, Petherick and many other travellers have reported what they have seen themselves or heard about the deposits. From the tales and explanations given me by Arabs and Nubas in different parts of the Province, I have endeavoured to piece together the fragments that most closely agreed.

Apparently about 130 years ago the Nubas of Southern Kordofan, after a period of comparative tranquillity, were raided by the Baggara tribes and were driven up their mountains, which they began to terrace for cultivation in parts remote or inaccessible for horsemen. About the same time, as the result of a tribal quarrel in Mesellemia near the Blue Nile, certain families of Arabs emigrated westwards and settled around Jebel Sheibun, whence they took the name of "Shawabna", and the Shawabna soon became famous as middlemen between the Arab trader from the north and the Nuba who collected the gold.

Gold was sold by weight, the principal articles of barter being cattle, beads, brass and iron; and, apparently, about 1880, gold dust to the value of fifteen shillings was exchanged for a cow. The Shawabna, according to Pallme, started melting down the dust and forming it into rings, but as they also adulterated it largely these were soon refused by the traders and dust stored in quills, usually of ostrich feathers, or small nuggets only were accepted.

The gold was taken principally to El Obeid and there formed into ornaments, very few of which, if any, found their way back to the south, for the Nuba preferred a large quantity of brass wire to a small quantity of gold, and the Shawabna were, it is said, too impecunious. I have not seen any gold ornaments in this part, and the existence of such is always denied.

About 1820 Mohammed Ali Pasha conquered Kordofan and converted it into a Mudiria. The early officials and the Government are said by Russegger, in 1837, to have confiscated the ancient treasures of Kordofan to the value of many millions of dollars. It is certain that the plundered gold of Kordofan was not all derived locally, for Browne in 1798 and the merchants of El Obeid and Nahud today mention that a large amount of gold came from the west into Darfur and that some of it, even now, reached El Obeid.

The washing of gold probably languished a good deal after the Egyptian conquest and it was certainly extinguished during the early days of the Mahdia, in 1882, and has never been revived.

Method of Working.

From some old men at Tira Mandi I obtained the following particulars :

Gold is found here (1) in the sands and gravels of the khors, (2) in the surface soil and gravels of certain parts of the hill slopes and (3) in the sub-soil, a tough reddish clay filled with fragments of quartz, to a depth of not more than eighteen inches, in the same places as (2). With all three the same, slow method of washing was adopted.

After each storm of rain, the people, mostly the women, hurried out to their little plots of gold-bearing land—each family reserved certain areas, but there were also districts open to everybody, even to natives from other hills—and worked until the water was exhausted. Two half calabashes were used. About six pounds of material was put into one calabash and five or six washings made with clean water, to remove the bulk of the clay. This clay water was poured into the second calabash, allowed to settle a few minutes, then the material that settled out was poured back on to the original mass. Afterwards a smaller quantity of water was used about twelve times, each time poured into the second calabash and the heavier particles returned, the dirty water being thrown away. From the first calabash after about the eighth washing the stones were removed by hand. The motion of washing employed was not rotary but swinging or swaying. After the fifteenth washing the coarse material was poured each time into the second calabash, rewashed there when sufficient had accumulated, and any concentrates returned. When the last stages were reached the coarse particles were all removed with a piece of stick or grass, and then the concentrates were poured off into a small gourd.

In a day's work about ten loads, each of six to eight pounds, would thus be washed.

From the total concentrates the gold and iron were slightly separated under water and then the gold dust was collected with a feather. They showed me a grain of sand about one millimetre in diameter as expressing the result of such a day's work, but sometimes they said that nuggets were found—and the same grain of sand expressed the size of the nuggets.

If a nugget of considerable size had been found the discoverer had to sacrifice a fowl or an animal at the spot, and allow blood to pour over the nugget before it was removed, or his luck would fly from him and he would never find gold again. The "kajur", the local wizard or priest, decided the importance of the sacrifice. Apparently a visible piece of gold, about the size of a pin's head, demanded the death of a chicken, but one nugget, "about the size of a chicken" caused the death of two bulls before it was permissible to remove it. Since the finder had to provide a feast for his friends with the meat of the sacrifice and the usual merisa, this custom was hardly likely to be allowed to fall into decay.

The workers are all of the opinion that gold grew in the rains, that particles not only increased in size but came up to the surface of the ground, and that after many years a piece of ground that had once been washed would be found to be bearing another crop of the precious metal. It is easy to see how these beliefs would originate. They recognise the cavities and cracks of quartz as the place from which the particles were originally derived, but also imagine that white mica is a source.

Description of the Deposits.

Some important points about the sites of the old workings are as follows:—

- (1) The people of Tira Mandi sincerely believe that there are no other places in Kordofan save theirs where gold was obtained.
- (2) The Nubas moved around the country considerably more, I think, than has been imagined and, if tribal connection between hills were favourable, they went in parties to the gold diggings and carried back their findings to their own hills without, apparently, having to pay tribute of any sort to the mek of the first but only to their own mek.
- (3) Arab traders bought gold from the Nubas (or Shawabna, at Sheibun) at many recognised trading centres and these places were immediately assumed to be the source of the metal.

At Tira Mandi gold was washed by the local Tiras and their friends from Kawarma and Tira Khadra so late as 1880. There being tribal connection with the Nubas so far east as Fungor (according to Sheikh Nei of Mandi) it is quite likely that in a period of peace natives from Gadir and Lukha would have congregated at the Mandi

diggings in the rains. In this way the stories of gold at Tira Khadra, Lukha and Gedir would have arisen. I found some small old diggings, and gold, at Kawarma; so there is some foundation in fact concerning that site. The other "known" places will be mentioned in order.

Tira Mandi.

This group of hills runs east and west for about $9\frac{1}{2}$ miles, from north to south it is about 5 miles wide, and the highest point is about 650 feet above the plain. The S.E. corner is bounded by a detached conical peak, around which the present population lives, and which has, in the past, been called "Jebel Dahab".

The natives guided me to six groups of old workings, one north and five on the south side of the hill. These groups show the last sites that were being worked when the Dervishes raided the hills. I found traces of old workings existed for a distance of 8 miles on the south side, and for 4 miles on the north side, a total of 12 miles along the lower slope of the hills; and the width of some of these old places approached a mile in parts. Undoubtedly most of the surface has been turned over for gold at some time or another, but the lapse of time and recent terracing for cultivation obscure the old diggings.

The rock of Tira Mandi is a green hornblendic schist with many small and irregular veins of quartz, and it is the breaking down of these small veins that has provided not only the quartz gravel and fragments all over the surface but some of the gold. Some of the gold found in the soil probably comes from the green rock as well. Samples of quartz alone provide a trace of gold only, rather less than is found in the soil.

The district has been worked out: samples collected during a week's work on the gravels never gave more than a trace of gold; and the natives say that returns were known to be growing less and that many people had ceased work before all of it was stopped. There are no diggings on top of the hill and those on the side generally cease where the slope is more than 20° ; that is, they will not be more than 100 feet above the level of the flat ground at the base of the hills. Nearly all the Khor sands were washed regularly, to distances as much as three miles from the hill.

Atoro, Jebel Kawarma.

On the road from Tira Mandi northwards to Shwai, the first point of the Kawarma hills reached is a granite hill called Atoro. Between Mandi and Atoro lies 10 miles of slightly undulating ground, covered with quartz fragments and showing the same geological structure as at Mandi and the south end of Atoro. This country is forest covered. Although the samples I collected were negative in results, yet it is quite likely that prolonged native search in the past found productive patches, now forgotten. At any rate, quite near Atoro, among the foot hills, I found traces of old workings on a small scale and very detached; and from around these points proved the presence of small quantities of gold in the gravels. This place is quite unknown to the natives as a source of gold.

Sheibun.

In spite of universal opinion and belief, there are no old workings at Sheibun and there is no gold in the district—it would be a geological miracle if there were.

In connection with my journey to Sheibun there is the following story to tell; not geological or mining, but psychological rather; a striking example of the delicacy which prompts the native to say or tell whatever he thinks is wanted to be heard.

Some of the descendants of the Shawabna now live at Jebel Shwai, so I went there to pick up information and find guides to the Sheibun district. Sheikh Naser, his sons and several elders came down to see me and expressed entire sympathy with the objects of my requirements. They described to me roughly the position of the pits at Sheibun, but all of them denied having personally seen those interesting places, since they left the hill in 1882; and they gave me some useful information, which is written above. An old Nuba who knew and had worked at Sheibun was provided as a guide; and I departed for Sheibun.

During six hours' walking and climbing around the group of little hills, with my astonishment increasing with my weariness and hunger, I had been led to a little hole on the hill side where some fine white clay had been extracted, to an old rain water pond, to the sites of the old villages and to some mounds of mountain debris. I then said that in my opinion there was not and never had been either gold or gold-washing at Sheibun; and the policemen with me said that was exactly

what the Shawabna had told them privately the day before yesterday. On my arrival at the camp—after ten hours continuous walking, without food—I found that my servant had heard the same story; and he told me that he had not imparted it to me because he thought I would be angry! An answer which helped to soothe my extreme disappointment and remove my weariness.

The original inhabitants of the Sheibun hills were a tribe of Nubas, called Duleibis. They were of the same stock as the Moro, and used to wash gold regularly in the district of Dungur at the north-west corner of Moro. At Sheibun itself, in comparatively recent times, the same people regularly washed the Khor sands for the magnetite they contain and this magnetite was smelted into iron and forged into tools and weapons. The Shawabna, and others, had told me of Dungur as an old site; but their politeness forbade them to tell me that it was the main source of gold for Sheibun.

Further investigations on my part showed that Sheibun, from about 1770 to 1882, was the main marketplace for southern Kordofan. The settled Shawabna acted as go-between for the Gellaba and the Nuba, and not only the local Nuba, the Duleibi, came with his gold and other products but Tiras from Mandi also came here to barter. Since 1882 the hills have been entirely deserted, the wells have fallen in and the guide could not even remember where they had been; and the Shawabna are distributed to Shwai, Semma near Kadugli, the north end of Talodi and a few at Tira Mandi.

Dungur.

On the plain at the foot of the extreme north-west corner of the magnificent granite mass of Moro, exists about six square miles of similar rock and structure to that briefly described for Tira Mandi. One important khor coming down from the hills traverses this small area, there are several small khors and gullies upon it; and the Nubas of old washed the sands in these water courses but, apparently, never touched either the surface gravels or dug holes in the soil. The people here were, with the greatest difficulty, induced to show me these places, since they said quite candidly that they were afraid of the Government; and to make sure that they were not concealing their knowledge of some really important site I made a thorough examination of the neighbourhood, but without any success.

Native information led me astray several times and I searched for

non-existent old diggings and for non-existent gold in the hills north of Lebu, around Tembira (J. Um Dorrein) and in the Tabuli and Dagig hills.

Conclusion.

Gold was worked by the Nubas at Tira Mandi, Dungur and, to a small extent, at Atoro. The Mandi workings are the largest and most important, covering practically twenty square miles of ground, and so far as geological structure and tradition afford clues, they were also the richest. The Dungur workings are small, while the Atoro are so unimportant and old that they are forgotten by the present inhabitants.

The old sites are worked out to a considerable extent, but the native could make what he considers a sufficient profit for a day's work at the west end of Mandi and in the main khor of Dungur. European methods are useless. The quantity of gold is small; the depth of gravel carrying it is superficial, not more than eighteen or twenty inches; and a sufficient quantity of water is available during a very few days in the year. Search has not discovered any other alluvial sites and, unless very rich, such deposits are of comparatively little value away from large and constant supplies of water.

THE NUONG NUER.

BY CAPTAIN V. H. FERGUSON.

(This hitherto unadministered tribe of the Bahr El Ghazal Province was visited by the author in February and March 1921. His report on the visit was placed at the disposal of the Editors through the courtesy of the Director of Intelligence. The extracts here presented are given in their original form with a few verbal changes, but passages dealing with purely administrative questions have been omitted, and the arrangement altered in various places.)

Ed.

The Nuong Nuer may be divided into two parts:

(a) the Northern Section occupying the country between Lats. 8.23 and 7.50 and comprising the Adok and Koorial countries.

(b) the Southern Section between Lats. 7.50 and 7.8 and comprising the Raath, Thurnum and Adur countries.

The northern section consists of the Adok, Garquoich and Arol clans. These clans appear to be completely under the thumb of the *kajur* chief Teng who lives in the Adok country and who works in conjunction with the big *kajur* chief Madi of the Rill Nuer, whose country lies to the North and adjoining the Adok country. This Teng, a man of commanding personality about 30 years of age, has been mainly instrumental in upsetting the clans by undermining the power of the chiefs to such an extent that at the present moment the lawful chiefs have retired into the background altogether. The northern section appears to despise the rest of the tribe, partly because the latter are more under the influence of local chiefs and not under a *kajur*, and partly because the Southerners are supposed to be of inferior fighting powers. There are also other grounds for division between the two: the southern section are closely intermarried with the Shish Dinka against whom the Northerners have many complaints; the Northerners on the other hand intermarry only with the Rill Nuer and the Garwair people on the east bank of the Bahr el Jebel, and their principal enemies are Chief Wal Atiang of the Eastern District and Chiefs Tooch and Majak of the Central District.

The Southern Section consists of the Garliath and Garmok clans under Chief Rundial, the Luich and Gartiel clans under Chiefs Tiepp Kolang, Wellbot and Teng, and the Therk (or Kolang) and Lake clans under Chiefs Door and Bakkam. These clans are certainly

under better control than the northern portion at the present moment, but unfortunately a young *kajur*, called Due, who lives in the Thurnum country shows signs of following in the footsteps of Chief Teng. The Rill Nuer chief Madi is universally feared and his word is law.

The number of the tribe are estimated at 6900, of whom 2800 belong to the northern and 4100 to the southern section. The Arol clan is noticeably inferior in numbers, consisting of 300 persons only, while the others vary between 1100 and 1700. These numbers include men, women and children, and the actual fighting force probably does not exceed 2000.

The Nuer seem to be a most suspicious race, and the arrival of a Government official for the first time has undoubtedly upset their equilibrium, as it were, for they appeared to me to be an unhospitable lot and made my servants and carriers very annoyed by stealing anything they could lay their hands on. The men are well built and tall, but I was surprised at the inferior stamp of women I saw. I think the fighting qualities of the tribe have been greatly exaggerated and I do not see why they should be superior in this respect to the Agar or Shish of the Eastern District.

They own about 17500 head of cattle, of which only 4800 belong to the northern section. The Lake clan appears to be the wealthiest in this respect owning about double the number given for any one of the other clans.

The above numbers are of course a very rough estimate and probably are excessive. The cattle are of a smaller and shorter horned breed than those found in the Agar or Shish countries, but appear to be of a superior stamp giving more milk and being stronger constitutionally. The animals are housed in large *tukls* during the night. The annual losses from pleuro-pneumonia, dysentery, and foot and mouth disease seem to be heavy. Goats and sheep are kept but not in very large numbers. Chickens are absolutely unknown.

Spears of a very inferior quality and clubs are the only weapons in use. It has been wrongly reported that these Nuer are in possession of many rifles. They certainly have a few but I do not suppose there are more than a dozen all told. The rifles that are used in war are borrowed from the Garwair people of the Upper Nile Province and have been purchased by them from the Abyssinians.

With the exception of Tiang, which are found in large numbers almost everywhere, there is a great scarcity of game. I have not seen

any elephants but, to judge from their footmarks, they seem to roam all over the country in the wet weather. I saw large numbers of giraffe. Waterbuck may be generally found grazing with the Tiang. The absence of small game was most marked and, bar a few reedbuck, I really saw nothing. Very probably the game has migrated to the river owing to the lack of water and good grass.

The crops throughout the country are extremely poor owing partly to the bad quality of the soil but also to the lazy nature of the people. Nothing whatever is grown but dura with the exception of a few villages in the vicinity of Hillet el Nuer which have taken the advice of gallaba traders and started to grow lubia.

I do not think I have ever trekked through a more uninteresting country. To Lat. 7.17 North the trees are few and far between, but from this point North there is practically not a single tree to be seen anywhere except in a few isolated spots. The country is all black cotton soil full of holes caused by animals footmarks in the wet weather and at this time of the year it is baked as hard as rock. Deep cracks, in places some ten or even more inches wide, make the going for both carrier and donkey transport difficult and most tiring. A strong North Easterly wind blows daily from 9 a.m. to 4.30 p.m. and with the swarms of flies makes things most uncomfortable. The nights are cool and I have seen very few mosquitoes, though I should fancy they would be pretty plentiful in the wet weather as the place then becomes little short of one huge swamp.

History of the tribe.

It has been passed down from generation to generation that before the Nuong people came into existence at all the country was inhabited by people who had a connection with Heaven by means of a big rope which reached the earth at the foot of a large tree called Kot at a spot in the Nuer country about Lat. 8.30 Long. 30.18. By this rope men and girls used to descend daily to earth to get their food, and the people who did at that time inhabit the earth only died for two months during which time they went to Heaven and then descended to earth again by way of the rope.

One day about 300 odd years ago, a boy dropped from the skies with a fish at a place called Aparrar in the Atwot country close to Shellau, Long. 30.26 Lat. 16.26. The fish found its way into the Lau river and disappeared, but the boy roamed about and was eventually

found by a Mandari man who was out trapping game. The man asked the boy who he was and was told that he had no father, but had fallen from Heaven with a fish. He said he had witchcraft and by this means killed game for his food and wanted no assistance, but advised the man to leave him alone. The Mandari however took the boy to his cattle *marah* called Dorather (now belonging to the Quek, Atwot) and sat him in front of a fire made of dried cow droppings the smoke of which got into the boy's eyes and made them water so that the witchcraft was removed. The boy remained with the Mandari for many years until he grew up and was known to them as Rill (meaning in the Mandari language a 'fox' he being so called because that animal is found in the grass). One day the wandering spirit took hold of Rill and he finally ended up by the tree Kot, here he saw a girl wandering about and, taking a great fancy to her, had connection with her. The girl's name was Eleech and she had come down the rope from Heaven to get food, but taking a liking to Rill she refused to go back and when the other people from Heaven came to remonstrate with her she got very angry and would not listen to them. The people then left her and returned to Heaven and as a revenge cut the rope so that connection with earth was severed for ever and from that day those that died on earth never returned as the road was closed. Rill took Eleech and built his house at a place called Napegard Lat. 8.17 Long. 30.13 where he remained until he became a very old man. They had three sons Nweng Nuer, Rill and Manuair, one daughter Neethur and also one adopted Shish boy Ajang. They all lived together at Napegard until the sons grew up, but as there was always friction between them, their father Rill, who by that time was getting an old man, decided to return to Aparrar. With this object in view he called his family together and asked them what they wanted to do. Eleech said she would not leave Kot and must return there, Rill decided to go with his mother and Nweng Nuer would accompany his Father, whilst Manuair stated that he wanted to marry his sister Neethur. Ajang decided to return to the Shish country. On the following day Rill took a bull, cut it in half at the belly, and told Manuair to take hold of the head and Neethur the tail and to pull the two parts away from each other; after this ceremony the two were free to marry. Early on the next morning Rill decided to divide the property and told his sons to be present. Nweng Nuer was the first to arrive and was given a cow in calf, then

Ajang came and, knowing that Rill was nearly blind and that his share would not be a good one, said he was Manuair and was given the much prized cow calf which he took and immediately set off for the Shish country as fast as he could. Manuair then came and asked for his calf and when Rill found out that he had been deceived he was very angry and told Manuair not to leave a stone unturned until either he or his descendants got the calf back again and dealt out suitable punishment. (This was the beginning of the feud against the Shish). In place of the calf Manuair was given one old cow and four spears that Rill had got from the Mandari. The son Rill was given a small calf.

The family then broke up and Nweng Nuer and his father made their way back to Aparrar where Rill eventually died. Nweng Nuer became known to the Agar as 'Twot' (Agar for a 'goose' which has a different call to other birds) being so called because he spoke a hitherto unknown tongue which was composed of Mandari, Shish and Agar words. He married Mandari and Jur wives and became the ancestor of the Atwot Dinka. Manuair or Nuong built his house at Annek close to Hillet el Nuer Lat. 8.14 Long. 30.18. and became the ancestor of the Nuong Nuer.

Rill and his mother Eleech settled at Kot and, I am told, from him the Nuer claim to be descended, but I have not been able to verify this yet.

The village Annek appears to have been occupied for about 100 years by the descendants of Manuair who then started friction with the Shish on account of the calf taken by Ajang years before. The Shish at that time occupied the country South of Lat. 7.50 and gradually were forced to evacuate the country until their final overwhelming defeat took place at a *marah* called Thuom a few miles north of Lau Post about 35 years ago when the boundary between the tribes was settled as Fulla Ful Bar Lat. 7.2 Long. 30.28.

Apart from comparatively recent fighting with Chief Wal Atiang an Agar of the Eastern District, and the old friction with the Shish I can trace no wars against other tribes, but there has been much cattle raiding in all directions in the past.

Relations with the Agar Dinka. With the exception of a few isolated cattle cases the Nuer have no complaints against the Agar as a whole, but their great enemy is Chief Wal Atiang who has his village about 5 days march North of Rumbek. The reason for the

unfriendly relations between him and the Nuer has been represented to me by the latter as follows :—

Chief Wal Atiang's great grandfather Wayo was a Garliath Nuong Nuer who lived at a village called Burathoing. Wayo had three sons, Booth, Defeer, and Leeay. Both Defeer and Leeay claimed to be *kajur* men and there was always friction between them on this point, until matters got so bad that Leeay suggested that the first cow calf born to one should be taken to the *marah* of the other where a big fire should be lit and the calf made to stand in the flames. If the flames burnt it, then the owner of the calf had no witchcraft, but if it was not burnt it should be taken back to the *marah* of its owner and again put into another fire which, as a second test, should burn it to death. About a month later the first calf was born to Defeer and was taken as agreed to Leeay's *marah* where it passed the test and was not burnt, whereas on being put into a fire in Defeer's own *marah* it was burnt to death at once. Leeay, seeing this, fled in the night leaving all his cattle in the hands of Defeer and took up his quarters in the Agar country North of Rumbek. Here the family remained until Wal Atiang was born, about 65 years ago. When a boy about 15 years of age he went into the bush one day and found three young hawks in a nest, he blinded them all with a pointed stick and left them. On the following day he returned to find that the mother bird had cured the young ones by some medicine, that Wal is said to have found in the nest on his return, and which he asserts was got from Heaven by the mother bird. This medicine he took and became a noted *kajur*. As he grew up he made himself well known as a good leader of men and his following rapidly increased until he was strong enough to set his people against the Nuer if necessary. About the year 1886 Wal sent a message to the big Nuer Chief Madi inviting him to join forces and raid the cattle of the 'Turks' which were kept in the North of the Jur country about 35 miles South East of Rumbek, and close to the Bahr en Naam River. The raid took place and many cattle were captured, but trouble broke out between the two tribes on account of a cow called Akoy which both sides claimed. On reaching *marah* Mayjok, about 10 miles North of Bahr en Naam Post Wal Atiang ordered his men to attack the Nuer who were routed, but took with them the cow Akoy. This cow was lost during the excitement and was caught by a woman called Nyaquoeth, the daughter of a Shish man Mareng, and the mother of a son called Majak, who had married

a Nuer wife and lived at Raath in the Garliath country. Majak's cousin Them, who had married an Agar girl and lived also at Raath, assisted Nyaquoth to drive off the cow and eventually got it to his village at Raath. On arrival there Them claimed the first cow calf from the cow Akoy for his trouble and Majak agreed and handed over the calf in due course. Them then took the calf and went to live with his wife's relations in Wal Atiang's country. On arrival there the calf died and Them returned to Majak and claimed another to replace it, but Majak naturally refused and Them returned to Wal Atiang in a rage and was instrumental in stirring up so much illfeeling that about 1891 Wal Atiang made a surprise attack on Raath early in the morning when all the fighting men were away at the river getting fish. Save those that were lucky enough to escape, everyone in the village was killed including Chief Tootbooth, a second cousin of Wal Atiang's, and also Majak the owner of the cow Akoy. The cow and her offspring were also taken off with many other animals.

About 1905 Chief Wal Atiang's son Mattiang was killed by the son of Chief Tooch of the Central District and Wal sent a message to the Garliath Clan saying that he did not want to fight any more and suggesting that they should come to his village and he would kill a bull according to custom. The Garliath accepted and a bull called Madul was slain. After this Wal seems to have come to some alliance with Chief Tooch and news is said to have reached Chief Madi's ears of their intended combined attack on the Nuer.

Then Wal, fearing trouble, sent a message to Chief Madi inviting him and all the Nuer to make an alliance with him and to stop all fighting in the future. Madi accepted and in 1913 a big gathering of Nuer went to Wal's house and a bull called Moppair was killed.

In 1914 however, Wal broke the peace by attacking the Therk Clan *marah* of Angaych and taking all the cattle. A month after this he also made a successful raid on *marah* Asheer of the Garliath Clan, took all the cattle and managed, with the assistance of Kheir el Sid Bongo (son of Chief Morgan Bongo of Tonj) who had a rifle, to kill 4 men and a woman. The news quickly reached Chief Madi's ears and he at once set out with all his men to avenge the Nuong. He found the Garliath cattle assembled in a *marah* called Kul, recovered the lot and then gave chase, but Wal had too much start and, with his cattle, found refuge in the village of Chief Agoldar, at Rumbek. Madi, finding himself outwitted, determined to wreak vengeance on some

one, so spent one month in successful raids against the Gok and Raik Dinka.

The Nuong Nuer, ever thirsting for revenge against one of their own tribe who had turned against them, went with the *kajur* Chief Teng of Adok in Jan. 1921, to see Chief Madi and press the need for action against Wal. Madi, being ill, refused to have anything to do with it at the time, and told them to wait until he had recovered, warning them that they would suffer defeat without his aid. Chief Teng of the Therk Clan would not listen to what Madi had to say and attacked Wal with the result that 35 of his men were killed and many wounded.

The clans.

In addition to the historical traditions referring to the tribe as a whole the different clans preserve various stories about their ancestry and migrations. The following of these were collected :

Garquoich (subdivisions Nyawair and Reng) and *Adok* (subdivisions not ascertained). The eponymous ancestors of these two clans were brothers, who were born about 300 years ago at a place called Annek close to Hillet el Nuer. Here they remained for about twenty years and then moved to the Koorial country which their descendants occupy at the present time.

Arol. Arol, the ancestor of the clan, was a cousin of Garquoich and Adok, and a brother of Nuong. Like his cousins he was born at Annek, and when they moved to the Koorial country he migrated to Koytch about 15 miles S. W. by S. of Hillet el Nuer. In 1914 Koytch was flooded, the clan broke up and was absorbed in the Luich Lake, Garliath, Garquoich and Adok clans. The Arol are now quite a small community and probably do not exceed 300 persons all told. As the clan is so split up they have no recognised chief, but a man called Kair Kair living at Rauptchai in the Garliath country declares that when the Government takes over the country, he will assemble the remnant of his people at their old home Koytch and assume the chieftainship.

Kolong or Therk. (Subdivisions Jom, Roll, Lork, Boljok). This clan seems to date back about 200 years and does not appear to be of Nuong descent at all, although they call themselves Nuong. The story is that one day a girl called Equine was found in the grass : she was so young that she could give no account of herself and her par-

ents were never found. The child was taken to the house of a man called Garliath, a Nuong Nuer, with whom she lived for some time; but as he did not feed her properly she was taken over by his brother Lake. (This accounts for the fact that the Lake and Kolong clans always live together.) About the same time some people of Nuong found a small boy in the bush, who told them that his father was a *tiang hartebeeste*, so they took him to the cattle *marah*, where he remained until he grew up. One day when he was out with the cows he took them to graze at a spot where there was no water, and seeing that the animals were thirsty he pulled up a stump of grass, whereupon water spouted from the ground and there was plenty to drink. The people seeing this went back to the *marah* and told the others, and the next day the boy in a fit of temper was about to break his spear when all the cattle stampeded towards him and prevented him from doing so. Then all said that he must have witchcraft and must become a chief. He was accordingly married to the girl Equine and they settled in a village called Fateng (Long. 30.35 Lat. 7.35) which was the village of the clan until about the year 1845 when they fought with the Shish Dinka, who at that time occupied the Raath country (Long. 30.20 Lat. 7.39) and drove them to the south. The Kolong then occupied the Raath country where they remained until about 1900, when chief Dark, then head of the clan, was endowed with witchcraft and thought it necessary to take up his quarters in the Adur country (Long. 30.30 Lat. 7.17) Dark was followed by many of his people, but others remained and came under the rule of chief Wellbot, and thus the clan was split up, so that to-day they are under separate chiefs.

Luich (subdivisions Nyang, Kor, Eebot, Dark, Teng, Fair) and *Gartiel*. These two clans are of true Nuong descent and date back about 200 years. It appears that they first of all inhabited the Looch country which is situated on the Bahr el Gebel about Long. 30.35 and Lat. 7.50. and here they remained until about 45 years ago, when a bad famine forced them to move to better crop grounds. The people split up and the majority under chief Kolang, father of the present chief Tiepp, moved to the Thurnum country Long. 30.30 Lat. 7.23. The remainder adhered to a man called Quek, father of the present chief Teng, and moved to the Garliath country Long. 30.23 Lat. 7.45 where they built the villages called Nyot, Majok and Tee-et. Here Tengs people remained until 1917, when they too moved to the

Thurnum country and settled in a village called Tarraweng. The Gartiel have always adhered to the Luich for protection, as they are weak in numbers. Concerning chief Tiepp Kolang it is stated that he was a great fighting man in his day and committed so many atrocities by killing women and children that any children born to him die. He has altogether had 24 sons but all have died with the exception of four, one of whom is deaf and dumb.

Garmok (subdivisions Bol, Matwok, Bool) and *Garliath* (subdivisions not ascertained). It appears that the ancestors of these two clans were born at the village of Annek Long. 30.19 Lat. 8.13. where their offspring remained until about 1845, the time of the general attack on the Shish Dinka who then occupied the country as far north as Lat. 7.52. The Shish were driven out and retired to the Thurnum country whereupon the clans took possession of what is now known as the country of the Garliath between Lats. 7.52 and 7.40. They always lived together recognising one chief in common until about 25 years ago the chief Tootbooth was killed by Wal Atiang, the afore mentioned Dinka chief of the eastern district. This caused ill-feeling which is not yet by any means forgotten. After the death of Tootbooth the Garmok adhered to their chief Rundial, while the Garliath preferred to remain without a chief—but they submit their troubles to chief Wellbot of the Kolong or Therk clan, who lives in the Raath country.

NOTE ON DREAMS.

BY C. G. SELIGMAN.

Recent advances in Psychology indicate the interest attaching to records of dreams as they occur among barbarous and savage peoples, and it is believed that investigations into the dreams of natives might throw much light on a number of problems.

Experience among white civilised races has shown that a number of factors contribute to the form which a dream takes and certain principles underlying the series of changes which memories undergo before appearing in the dream have been formulated.

Dreams in themselves are the expression of an emotion and frequently constitute wish-fulfillments, i. e. fulfilment of desires which are often entirely unconscious and which sometimes have never been conscious. From one point of view dreams may be divided into three categories:—

1. Those that are both sensible and intelligible, i. e. they tell a connected story of the everyday world, the meaning of which is obvious. Such are (in the white races) many dreams of children and such adult dreams as that in which a soldier short of cash for cigarettes, dreams that he has received a letter full of £5 notes. In these dreams the mental processes resemble those of waking life. Such dreams are often obvious and simple wish-fulfillments.

2. Dreams which tell or enact a connected story and have an evident meaning, but their contents in whole or in part strike us as unnatural, and we cannot fit them into the fabric of our waking life, as when a man dreams that his brother is mauled by a lion or gored by a bull.

3. Dreams of which the content is bizarre, confused and non-sensical, such dreams often have a peculiar quality of unreality, and can scarcely, if at all, be related to the waking thought, e. g. the lion in 2 above has a human head or the bull has human eyes.⁽¹⁾ Much of the strangeness of these dreams is due to the

⁽¹⁾ *The processes by which many "symbolic" representations arise, are no doubt allied to those causing dreams. In Egyptian sculpture one of the common representations of the Pharaoh is a human headed*

symbolism used to express the dream thoughts. Joseph's and Pharaoh's dreams (Genesis XL and XLI) are good but not extreme examples of this form of dreams and might be used as illustrations in an attempt to get information concerning dreams from natives, but the symbolism in Joseph's dream in which his brothers' sheaves bowed down before his sheaf (Genesis XXXVII) is simpler and probably would form a better starting point. The modern ideas on the nature and significance of the processes which give rise to dreams belonging to classes 2 and 3 cannot now be discussed, it is only necessary to say that the unnatural and bizarre elements are considered to represent a symbolic rendering of a desire or emotion which we cannot bring ourselves to admit during our waking hours or which is immediately repressed because its unmoral or antisocial character is recognized, or which is so contrary to the normal trend of our modes of thought that it never reaches full development in our consciousness. (1)

lion and in the Ashmolean Museum there is a Meroitic pottery vase from Faras upon which is painted a human headed lion mauling a negro. Or the symbolism may be less elaborate as when the Pharaoh is represented as a "strong bull" The writer of this note has himself had a dream in which a friend, a successful breeder of pedigree cattle, appeared as a bull with human eyes.

(1) Thus a patient suffering from mild "shell-shock" had the following dreams within a relatively short period:

1. He was talking to his wife and noticed that her wedding ring had worn thin, he warned her that if she was not careful she would lose it.

2. His furniture was being sold by auction, he woke up as his double bed was being sold. When relating his dream he expressed surprise that this dream has not worried him.

3. Two women were sitting in a trap, the horse bolted along the edge of a cliff and it seemed that they must shortly fall over. He woke up horrified and upset. On discussing the dream it appeared that though he could not see the faces of the women, one reminded him of his mother-in-law, the other might have been his wife.

It was discovered that the patient was thoroughly dissatisfied with his domestic life (though he had no reason to blame or distrust his wife) and that this had worried him a good deal.

It should be recognised that abstract ideas and mental states can only be rendered in dreams by concrete images, e. g. the good and bad years of Pharaoh's dream by fat and thin cattle, and acutely felt self-dissatisfaction and distrust (in a case under the writer's observation) by the dreamer publicly exhibiting his incompetence in his own line of work. Moreover what is termed "condensation" often occurs in dream symbolism. In these cases there is a fusion of two or more concepts as e. g. when one friend wears the clothes of another or behaves like another, or where a fresh individual may arise having certain physical characters belonging to each of two persons. In waking life there are a whole series of such "condensations" where a number of objects—often themselves "symbols"—come together often giving rise to objects of great emotional appeal, e. g. the badges of various brotherhoods and even the National flag.

It would be extremely interesting to know whether the dreams of natives belong in the main to class 1 or to the other two classes, and if to the latter whether they can in a general way be regarded as disguised wishes or fears. The little information on dreams which I have in my notes, collected in the course of general anthropological work, before I took any interest in the subject, only show that natives not infrequently have dreams of class 1.⁽¹⁾ It would be very desirable to record a number of dreams in as much detail as possible and if dreams of classes 2 and 3 occur to find out whether any special meaning is attributed to them, i.e. is the fact of symbolism in dreams recognised, and if so are there general conventional meanings attached to particular symbols or even personal meanings, in the latter event does the individual consider that certain objects or animals or people dreamt of have a particular significance for him, and if so upon what experience or fantasies does he base his belief.

It should be relatively easy to investigate one type of dream: The members of almost every African tribe at one time or another sacrifice to their ancestors, and in a number of instances it is recorded that the ancestor appeared in a dream and demanded a sacrifice, sometimes I believe threatening ill health or misfortune if the sacrifice be not made.

(1) *The only two forms of dreams that occur in my notes are*
 (i) *the appearance of ancestors often demanding sacrifice, and*
 (ii) *frankly sexual dreams.*

When among the Nilotes I was many times told that an animal was killed because an ancestor had appeared in a dream and demanded it, but unfortunately I made no notes as to the circumstances of the dream. It should not be difficult to discover the scene of a dream and the character of the surroundings, whether in the hut or in the open, the people, animals or things who were dreamt of as present, the form in which the ancestor appeared (human or animal), whether in age or youth, in health or as in his last illness, what were the actual words spoken and so on. In this paragraph it is assumed that the dream of an ancestor demanding sacrifice is a dream of class 1, it may of course belong to one of the other classes, though I think this is not very likely for class 3. But if the dream is of either classes 2 and 3 the symbolism would be well worth investigating, it is quite possible that the ancestor might be represented in the dream by the appropriate totem animal or as part animal, part man⁽¹⁾. Thus among the Dinka who are totemic I have been told that the ancestor who would come to or fetch a dying man might appear in his animal form i.e. in the form of the totem animal. ⁽¹⁾

⁽¹⁾ *Nyakang, the first king and culture hero of the Shilluk, and his sister Nyakai immediately come to mind. According to one account the mother of Nyakang—the daughter of a river being Ud Diljul—had the lower part of her body like that of a crocodile and in one version of his saga Nyakang inherits this saurian character. Nyakang seems generally to have outgrown his crocodilian character and to be regarded as fully human in form and as more than human in character, but his sister is still definitely associated with the crocodile, for she lives in the river, and though in old days she would assume human form and at times come to the village by night in all friendliness, she might seize a man or woman and bear him or her off to her home in the river and there change her victim into a crocodile to be the spouse of one of her crocodile relatives. Nyakai is known by her short, stout figure and great muscular development, and by the fact that she mounds her words. That the river is the true home of Nyakai is shown by the sacrifice made to her. Just as a sacrifice would be made at the shrine of Nyakang, or at the grave shrine of any king, if Nyakang appeared in a dream, or if one of the kings had possessed a man, causing him to become ill, so if a man or woman becomes ill owing to possession by Nyakai, sacrifice is made by throwing into the river a live sheep with its legs tied together.*

It would be of great interest and considerable psychological importance to determine whether "primitive man" so-called dreams of ogres and monsters (such as dragons) and if so whether he conjures them up *ab initio* from his own mind or whether his monsters invariably conform to legendary types. In such an inquiry the possibility of a considerable part being played by day dreams should not be overlooked.

It is suggested that dreams should be recorded somewhat as follows, though it is recognised that it may not be possible to adhere to a set plan.

(a) The dreamer's account should be taken down word by word in the vernacular without interruption, prompting or questions.

(b) The dreamer should then be asked to repeat the dream (this account may well be found to be rather more elaborate than the first and may throw light on the latent content of the dream).

(c) He should then be asked to explain the whole dream and his statements should be recorded.

(d) After this unless the dream be of the obvious and open wish-fulfilment type outlined in 1 the dreamer should be asked to explain each incident and each figure in the dream. It may be found that he is able to give but little explanation, in which case the dreamer should be asked of what each incident or figure makes him think.

It may help the investigator to remember that although Freud, to whom we owe the first clear statement of dream mechanisms, believed that dreams refer predominantly to the sexual sphere, further research, particularly experience of the war neuroses, shows that any emotion especially if accompanied by psychic conflict, as in the struggle between fear and duty, may be the efficient cause of dreams. (1) Jung, if I understand him aright, regards the dream as an attempt (usually by way of analogy) at adaption to present or future demands or difficulties, while it has been suggested that one function of the dream is to make some of life's problems clearer to the dreamer.

(1) *It must be recognised that in the white races a conflict so slight as to produce scarcely a passing annoyance may yet give rise to a dream perhaps with elaborate symbolism.*

Finally there are certain points of view concerning dreams that it would be useful and interesting to investigate.

(a) How far are dreams attributed to physical conditions and sensations arising during sleep, (as where a dream of walking on ice is attributed to cold feet).

(b) How far are dreams attributed to supernatural or extra-personal causes.

(c) How far is prophetic significance attributed to dreams.

(d) Are dreams ever considered to be of no importance and to need no explanation.

I need scarcely say how grateful I shall be for any records of the dreams of natives or for any notes on beliefs connected with dreams. These should be sent to me c/o The Director of Education, Khartoum.



NOTES.

Red Sea Province.

When I was at Suakin recently I had occasion to refer to El Teb, and I noticed that the local pronunciation is El Teib. I enquired the origin of the word and ultimately ascertained as follows:— The Hadendowa name of the place is "Andette" which means the place of hobbles, so-called because the Arabs hobbled their camels there when drawing water. In conversation, by a grammatical construction of their dialect, the place is constantly referred to as "Andetteib" which presumably was taken by an Arabic speaking person to be And El Teib **عنند طيب** and the place was called El Teib or El Teb.

C. A. W.

Sobat and Pibor District.

Kingship Amongst the Anuak.

The following notes are extracted from a report rendered by Lieut. Colonel C. R. K. Bacon, O.B.E. on a visit paid by him to the Anuak of the Adonga district.

About October 1920 Akwei Walad Sham, the Anuak Sultan died and was succeeded by his son Sham Walad Akwei, a youth 12 years of age. The late Sultan was a strong and despotic ruler and was at enmity with the Abyssinian Anuak who, led by Oodial Walad Kwat (Abu Chala) have frequently attempted to seize the four legged stool that is the emblem of Sultanic authority. The fact that his successor was a mere youth appeared to have brought about the possibility of internal dissensions.

After a somewhat difficult journey through dense grass and across a good deal of swampy country I reached the Oboth river in the Adonga District on the 18th January; there a party of Anuak met me bearing a message of welcome. Leaving my transport in camp on

the river I proceeded on the morning of the 19th to Utalo where Sham lives. As these Anuak had never seen a camel I decided at the cost of some discomfort to make my entrance to the village on one of these baggage animals, seated on empty sacks covered by a red blanket.

I found the youthful Sultan squatting on a heap of leopard skins strewn on a raised mud platform awaiting my arrival. He was attired in a red robe of honour given to his father by the Abyssinians; on his head he wore a head dress surmounted by the long feathers of the Secretary bird which are worn by none but the Sultan, and across his face hung rows of cowrie shells.

Sham Walad Akwei is a lad about 12 years of age, but he conducted himself with great dignity, and when necessary was prompted in his speech by one of his advisers. The greatest respect was paid to him. Influential men only approached him in a crouching position, and after spitting on their hands and rubbing them in their hair they touched a hand that was condescendingly stretched out to them. There were a large number of men present each of whom carried a rifle, but no woman except the Sultan's mother was allowed in the vicinity.

As a result of my interview with the Sultan in the morning and a return visit paid by him to my camp in the afternoon I informed him that the Government would recognize him as the Anuak Sultan, and that I would announce this publicly next day at his house whither everyone was to collect.

On the morning of the 20th mounted again on a camel and wearing, in order to compete with his royal robes, my old regimental red shoulder sash and an ivory-handled curved trade sword supported by red and gold slings I proceeded to the village. En route my bugler, not to be outdone by the Sultan's drums and horns, blew various calls to announce my coming and a small guard of honour of the 10th. Sudanese greeted my arrival at the royal residence. As the compound was not large enough for the occasion the ceremony was arranged to take place in the large open space outside the Sultan's houses.

After informing the assembly that the Government intended to recognise Sham Walad Akwei as Sultan of the Sudan Anuak I took off my sash and sword and put them on Sham who then, for the first time, took his seat on the throne which was produced with due ceremony. I then took my departure amid a pandemonium of songs, drumming, blowing of bugles and horns etc.

The real respect and fear displayed by the people towards their Sultan was something beyond my anticipation, and I should imagine his power was as autocratic as that of the Mek of the Shilluk. Nevertheless indications are not wanting that dissensions may now arise when one so young has to hold his own under difficult circumstances. Sham Walad Medda, a rival chief, seemed to be dissatisfied with the accession to power of a boy, and he appears to have a large following. Also the Abyssinian Anuak may think it a good opportunity to try to obtain the sacred stool, as it is certain that the Sultanic power is conferred on the possessor of the stool only.



SCIENTIFIC RESEARCH COMMITTEE.

Methods of Accelerating the Germination of Seeds.

BY F. J. MARTIN AND H. R. GRAY.

The possibility of accelerating the germination of seeds was raised by the Forests Department in connection with schemes for afforestation of certain areas within economic distance of Khartoum. The rainfall in this neighbourhood is very meagre (on an average about five inches a year) and inundations from flood water have to be relied upon to supply the moisture necessary for tree growth. Under these conditions the "Sunt" tree (*Acacia Arabica*) appears pre-eminently suitable for propagation as it is able to withstand a certain amount of irrigation and by the rapid elongation of its tap-root it can keep in touch with soil moisture and thus is enabled to persist over dry periods. If protection from grazing during youth is afforded, seedlings should grow sufficiently fast to withstand subsequent inundations.

The suggested method is to sow the seeds immediately following the subsidence of the annual flood, and in order that the resulting seedlings may make the most of the residual moisture, the germination of the seed must take place within a short time of sowing. Under the most favourable conditions sunt seed may take a considerable time before germination and the experiments described here were made in order to arrive at a treatment which would result in a high percentage germination in a few days.

At the request of the Forests Department in 1919, preliminary experiments were made in the Chemical Laboratories on treating sunt seed with concentrated Sulphuric Acid with a view to stimulating germination (see Indian Forester, July 1913). Germination

trials with treated seeds were carried out by Mr. Sillitoe, the Superintendent of Gardens, Khartoum and very promising results were obtained (see report of the Government Chemist 1920).

Further experiments were recently carried out to ascertain the most suitable type of treatment and batches of seeds were treated as indicated below, the results being given in table I.

TABLE I.

Treatment.	Time.	Percentage germination.
Untreated	—	nil
Conc. Sulphuric Acid.	1 hour	35%
do	2 hours	90%
Caustic Soda (50%) ...	15 minutes	nil
do	30 "	nil
do	1 hour	nil
Boiling water ...	1 hour	nil

Another batch of seeds was treated with concentrated Sulphuric Acid for four hours, but this treatment was apparently too severe, the seeds being severely carbonised and the percentage germination fell to 50%.

From these experiments it appeared that concentrated Sulphuric Acid for two hours was the most suitable treatment and experiments were carried out to find the quantity of Sulphuric Acid required. As a result of these trials it was found that one pound of acid was sufficient for treating one pound of sunt seed. As 1½ lbs. of seed are sufficient to sow one feddan of land the cost of treatment works out at less than one shilling (5 P.T.) per feddan, the cost of crude acid being taken as sixpence per lb. in England.

Concentrated Sulphuric Acid however requires careful handling and experiments have therefore been made with weaker acid for longer periods of time. A high percentage germination was obtained by treating with 50% acid for six hours.

The results are shown in the following table :—

TABLE II.

Treatment.	Time.	Percentage Germination.		
Sulphuric Acid 50%...	6 hours	90	} after 10 days	
do	12 "	50		
do	20 "	10		
		After 1 week.	5 weeks.	7 weeks.
Acid 33%	6 hours	2%	30%	39%
do	12 "	8%	28%	50%
do	24 "	36%	48%	56%

The action of concentrated acid on the seed coat is very marked in some cases removing part of the outer integument of the seed coat. In order to see if the action of the acid were mechanical (i.e. destruction of the seed coat to provide a means of ingress for water) rather than chemical, the seeds were given a purely mechanical treatment. This consisted in filing through the seed coat of each individual seed at the end furthest removed from the micropylar orifice, thus exposing the tips of the cotyledons without damaging the embryo. These seeds were then subjected to germination trials and within five days had given the same percentage germination as a similar batch treated with concentrated acid. The action of the Sulphuric Acid therefore would appear to consist in rendering the seed coat permeable.

The filing of individual seeds however involves much tedious labour and therefore is too costly, but if a mechanical device such as is at present used for the mechanical treatment of clover seeds, could be adopted for these seeds this type of treatment might prove to be less costly and troublesome. In the absence of such a machine we are at present using the acid treatment.

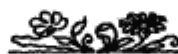
Previous to the present set of experiments it had been suggested that with a view to sowing either before or during the flood, the question of the effect of immersion in water on treated seeds should be investigated. Experiments to illustrate this were accordingly carried out with the following results.

TABLE III.

No. of days immersion in water	Percentage Germination
1	75
2	70
4	75
8	55
16	55
32	50

From this it will be seen that the germination capacity was gradually weakened by immersion in water, even for the comparatively short period of 32 days, and probably they would have to stand a much longer immersion than this.

Sunt seeds which had been kept under dry conditions for 3 months after treatment only gave a germination of 8%, so that it would appear advisable to sow the seeds as soon as possible after treatment.



CORRESPONDENCE.

The Kababish.

The following remarks are extracted from Mr. Davies' reply to the comments made by Dr. and Mrs. Seligman on his review of their paper on the Kababish (S. N. R. vol. IV, No. 1). Ed.

As regards the five verbal inaccuracies to which I drew attention: the authors are silent as to three of them, and they have misunderstood my criticism of one of the others. The virginity of the she-camels was not in question: I was merely pointing out that *bakra* should be spelt with a ك, not a ق. They admit that شجرة should be شجرة. In saying that *shugāg* (not *shugga*) was the ordinary word for a tent I do not think that I have fallen into inaccuracy. I was referring to the type of Arab tent under discussion, and I do not imagine that many readers of the review will have taken me to mean anything so obviously untrue as that *shugāg* was the ordinary word for any and every kind of tent.

I hold to my criticism of Dr. and Mrs. Seligman's exposition of the word *nushūgh*. When they say of the "yearly migration to the north west" that "there is a particular word to express it *neṣūk* (نشق to go north west)" the train of thought is (1) نشق = to go north west (2) the yearly migration is to the north west (3) the yearly migration is called *neṣūk*. This is a misleading inversion, and it would remain such even were the Wadai use of the word under discussion. The correct account of the use of the word which I noted in Wadai is (1) نشق = to go to the rainy season pasturage (2) this migration, in Wadai, happens to be to the north, (3) hence in that region the word نشق has acquired the secondary, specialised meaning "to go north", in addition to its general meaning. My experience of the Kababish speech is that with them the word has not acquired the corresponding specialised meaning, e. g. a Kabbashi who went to the north west in February to look for a stolen animal would not describe this motion by saying نشق.

As to the "general propositions" I do not think that it is a correct use of words to describe a section as "of Beja origin" merely because

it has "taken its name from a fictitious Beja ancestor" or because it has "absorbed an inconsiderable" (or even a considerable) "number of Beja elements". If this is all that the authors meant, it certainly goes some way to lessen my difficulty, but I do not think that the phrase is rightly so to be understood.

In the matter of the position of the Nazir there is a difference between my point of view and that of Dr. and Mrs. Seligman, who appear to have been trying to ascertain the position of the holder of the office of Nazir in general. This I think is a vain quest, for the reason that the personality of the individual holder of the office is a far more important factor than tribal custom in determining his authority. My remarks were directed solely to the position of Sh. Ali el Tom, and my estimate is therefore unaffected by anything which the Kuraysh may have done during the Mahdia.

R. DAVIES.

A Hausa symbol.

In the July number for 1920 of Sudan Notes and Records (vol. III. 3) Ba-Ture published a "Hausa symbol" and asked for information about its occurrence in other places and its significance. It may be of interest to him to know that Dr. Capitan wrote a very interesting paper in the "Comptes—rendus de l'Academie des Inscriptions et Belles—Lettres Bulletin 1918, pp. 197—209, entitled *L'entrelace cruciforme*. He shows that this symbol occurs very frequently in the prehistoric art of America, such as the pottery of the Mound builders of the Mississippi valley, some monuments of Yucatan or Mexico, but never in South America. It is frequently found on the borders of Roman mosaics, and is also represented on a Coptic sudarium in the Victoria and Albert Museum and on Merovingian buckles, Gallo-Roman pottery and in Roman art. This symbol had undoubtedly a religious, magic and prophylactic significance, and recalls the Buddhist swastika, but it is difficult to trace its origin and the particular value attached to it in different times and countries.

ET. COMBE PH. D.

The Sign of the Cross.

I do not know whether the following observations among the Nubas of Heiban are of any interest or value, but I send them for what they are worth.

1. What importance, if any, can be attached to the fact that one often sees Nuba people, men and women, wearing beetles very similar to scarabs, hung round their necks or from their belts? There seems to be only one kind of beetle thus worn and it is not by any means the most highly coloured one they could find in this region, so it does not seem to be worn merely for ornamental reasons. Has this any connection with the wearing of scarabs among the ancient Egyptians and the Hamitic elements in the origin of many of the Sudanese people?

2. I have often noticed that a cross mark (thus +) is made with dung on the body of a very sick Nuba person. One of our patients left us to go to the local *kajur*, but returned later, much worse in health, with this cross mark on his abdomen.

3. Before the Heiban Nuba girls begin to dance they put some dust on their chests in a manner which, if seen in an Eastern Church, would be called "making the sign of the Cross". Also a little Nuba boy accused of stealing made this cross mark on his chest when he denied the charge.

In case No. 2, an exact cross mark was made. In the case of the girls and boy mentioned above an exact cross is not made with the dust, though it is as much like a cross as the sign made in many churches.

I should be very glad to know whether any of the above customs are common to other Sudanese tribes.

D. N. MAC DIARMID.

'Instances of the use of the cross amongst Sudan' Arabs' are given in S. N. R. Vol. I, p. 55 and 216. The view that the Nuba of the Mountains Province are descended from Christian Nubians of the Nile Valley has lately been called in question by Professor Meinhof, who holds on linguistic grounds, that the separation of the Nubian Hill people from their Nilotic kinsmen must have taken place at a time anterior to the period when Christianity was dominant in the Nile Valley. Cp. S. N. R. Vol. III., p. 288 Ed.

The Eastward Drift of Sudd Obstructions.

In considering the causation of obstruction to river navigation, whether by floating vegetation or by sand, there is a point of some interest which is apt to be overlooked. I refer to the existence of an ever present, though scarcely appreciable tendency, not only for water but for all floating matters, to push or gravitate eastward.

The subject has been carefully studied during the last 15 years and I believe satisfactorily demonstrated by irrigation engineers in connection with the great rivers of India and is explained as being due to the Earth's rotation.

The effects of this action are said to be best seen in rivers running north and south as compared with others running east and west. North and south rivers, unless other counteracting forces are at work, tend to remain sluggish, and apt to become blocked by floating vegetation; whereas rivers having an east and west course, especially those flowing eastward, tend, by reason probably of their accelerated current, to clear themselves automatically of floating obstructions, and retain for themselves sound banks. Instances of this are said to be found in many parts of the world.

The effects of the gradual, never-relaxing pressure eastwards in the case of north and south rivers with sound banks, is to wear away the east bank, but in the case of rivers having a similar direction, but flowing through swamp areas, the effect of the continual pressure of floating matter eastward is seen in the gradual tendency to pack to the eastward, obliterating open water in that direction, and forming alluvial flats and solid ground ultimately resulting in the slow movement of the navigable channel westward, and a gradual drying up of the swamp area from east to west.

No better demonstration of this theory, and theory it must remain, could well be found, I should fancy, than the vast area of swamp and water in the Upper Nile known as the "Sudd" region, and through which flows the Bahr el Gebel from south to north. On the east of the present channel of that river are vast areas of alluvial flats, for the greater part dry land in the dry season, but flooded in the rains; whilst to the west are the chief areas of floating vegetation and expanses of open water, as well as swamp grass flats. The Bahr el Gebel itself once having been opened by the energy and resourcefulness

of man remains open, assisted by regular navigation, a cessation of which would probably soon result in its again sudding up. Beyond Lake No the river changes its course to east, and sudd and swamp vegetation abruptly ceases, the above described action presumably having sufficient influence to accelerate and clear the stream from that point.

As to the slow movement, during the course of ages, of the navigable channel of the Bahr el Gebel westward, owing to the gravitation of floating material eastward, a study of the map with a little knowledge of the region, will convince one that this has really taken place, and that the movement is still continuing. Between Bor and Malakal are clear indications of at least three old river courses from Duk Fadiat to the Bahr el Zeraf, each more distinct than the other until one reaches the present channel.

The same influence, whether due to the earth's rotary motion or not, is being exerted, though with very different results, along the whole length of the Bahr el Arab and Lol rivers, both of which have a west to east course, and with the exception of a sudd-block of some 10 or 12 miles or so near the termination of the Bahr el Arab, both are open water rivers, having well defined clean-cut banks, and automatically cleaning themselves of floating obstructions.

If, therefore, the above observations as to self-clearance of eastward flowing rivers, and the slow blocking of north and south flowing rivers are correct, whatever the cause, it would seem pretty certain that if the 10 mile block on the Bahr el Arab were cut through, the river itself would probably keep the channel open, there being, as factors tending to strengthen the probability, a greater depth of water and a stronger current in the last 36 miles of the Bahr el Arab than in the Bahr el Ghazal into which it flows.

Moreover, if the obstructions were removed there would exist, according to all available information, an eastward flowing and self-clearing waterway, not only along the Bahr el Arab from its head waters but along the Bahr el Ghazal to Lake No and the White Nile, a distance of 400 miles; and, further if some expert attention were centred upon Lake Ombadi, and fugitive sudd prevented from driving northwards with each favourable wind into the Bahr el Ghazal, navigation in that water-way would be free and unhampered by sudd at all seasons.

From what is now known of the gradual encroachment of the dry zones of Africa upon its tropical rain belt, and the assumption that the Nile Sudd region, an area of over 35,000 square miles, is what remains of a once vast lake, as was the Central Congo basin at one time, it is easy to realize that the longer the delay in defining, clearing and maintaining the valuable water-ways in this region, the greater will be the difficulty and expense of doing so at a later date.

I regret not having access to the literature dealing with the above theory relating to the effects of the Earth's rotation upon floating matter. If my memory serves me rightly the first publication on the subject was an article in the Geographical Journal some twelve or fourteen years ago.

C. CHRISTY.

ERRATA.

The following misprints in Mr. Hillelson's Arabic Proverbs etc. (Sudan Notes and Records vol. IV no. 2) are brought to the notice of readers:—

- P. 80 line 34, for Qur'an p. 69 *read* Qur'an sûra 69
- P. 81 footnote, for Commenteny *read* Commentary
- P. 82 line 22 *omit* 'to' after 'Tadmor'
- P. 83 last line, for Ummaiyad *read* Umaiyyad
- P. 86 line 16 for wa el-ḥarām *read* wad el-ḥarām
- P. 86 line 19 for nattāga *read* naggāta

SUDAN NOTES AND RECORDS

Volume IV.

No. 4.

RELIGIOUS CONFRATERNITIES OF THE SUDAN.

BY C. ARMINE WILLIS.

CHAPTER I.

One of the most familiar sights and sounds of the Sudan is a little knot of men, gathered in a circle, all bending from the waist together and making a guttural exclamation in chorus, for long periods together. The exclamation is the name of God, "Allah", pronounced in unison, and so emphasized that the earlier syllables are lost. The circle is a gathering of the followers of a "*Tariqa*" engaged in prayer.

The object of this note is to indicate the origin of the *Tariqas* and to shew their distribution in the Sudan.

It is a commonplace to speak of the "mysticism" of the East, and Islam was immersed in mysticism from its birth and throughout its early history until the mystical idea was established in it. Not only was the preaching of Mohammed itself based on his mystical knowledge of God, but there was a considerable influence exercised over the early days of Islam both from the monophysite heresy of Christianity, and the teachings of the Neo-Platonists, especially Plotinus. It is not claimed that the influence was a direct one, but these ideas were current at the time and had a great influence on all contemporary thought. Further as a mystical influence the Buddhists were a force both from their proximity and their religious power.

Now the five props of Islam are these: the confession of faith, (there is no god but God and Mohammed is the prophet of God),

the five daily prayers, the payment of the poor tax (*zaka*), the fast in Ramadan and the pilgrimage to Mecca. Except in the first there is little room for mysticism. But in the first lay the key to the mystical idea as it implied the eternal unity of God, and with the philosophical influences referred to above, that led to the idea of the immanence of God in man, and the possibility of his identifying himself with God.

Now there is a very important distinction in the definition of knowledge according to the Moslem writers, which gives the clue to the growth of the mystical idea. Knowledge is divided primarily into religious and intellectual, i.e., the knowledge of God is not necessarily a matter of the reason but is acquired by some other means, and it was the pursuit of these means that led to the formation and spread of the *Tariqas*.

The mystical knowledge of God i.e., the non-intellectual, had been identified with the Sufis. Whether this name was to be attributed to the asceticism that condemned them to wear only wool, or whether it is a corruption of "*sophia*" and is really derived from Greek philosophy has been disputed. Sufism dealt especially with the search after God by mystical methods, and Islam had to adopt it or adapt it to itself. The following saying of the Imam Malik even though it may be spurious indicates well the attitude of Islam "Sufism without Law is heresy, and Law without Sufism is impiety, but he who possesses the two possesses the truth".

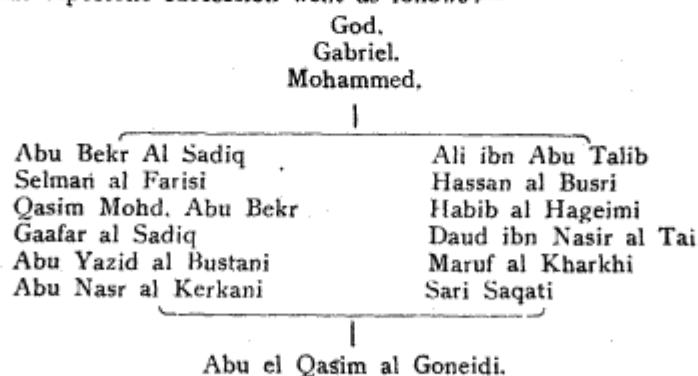
Ibn Khaldun in his Preface to his Universal History, which was written in the latter part of the fourteenth century A. D., divides the general position of the Sufis under four heads: 1. The discipline of the soul, the keeping it to strict account for actions, the tastes of bliss and the ecstasies which come to it; its ascent from one spiritual stage to another. 2. The unveiling of the unseen world and perception therein of spiritual things, of the real nature of things and how they proceed thence. 3. Control of material things by the grace of God. 4. Those wild fanciful expressions which many of them utter in ecstasy, the *literal* meaning of which gives no clue to their meaning. (Macdonald, *Religious attitude and Life in Islam* p. 172). Ibn Khaldun himself depreciates the last but his own

experience of the mystical life makes him a strong advocate of the system.

The idea of the mystical knowledge of God gradually developed in Islam, following the lines of research that the Sufis had laid down, merely adapting them to the Law. Thus there grew up a number of teachers who instructed others in the best means of attaining the mystical truths. The method was a general asceticism; little eating, little speaking, little sleeping, shunning society, the continual repetition of God's name and the contemplation of God's works.

It was necessary however to establish the sanctity of the mystical knowledge so obtained by connecting it with the saints of Islam and the prophet. To this end there was an apostolic succession derived through the head of the fraternity to some previous mystical leader, and so ultimately to the great saints and the prophet himself. The ordinary line of succession was through Abu el Qasim el Goneidi who died at Baghdad in A. H. 267. He was a great mystic, and himself drew his holiness from Ali ibn Abu Talib. The latter was looked on as the spiritual descendant of the prophet, and was also venerated as a great soldier and an exceptional mystic. A specimen of his mysticism is thus: "I am the dot under the letter B. (i.e.; in the expression *bismillah*), I am the side of God, I am the pen, I am the table set apart, I am the throne of God, I am the seventh heaven".

The Apostolic succession went as follows:—



Thus there was a double line to the prophet and so to God.

There is another tradition whereby the succession is derived through al Khidr. He was one of the two mortals who achieved Heaven during life; the other was Enoch, the latter did it by a trick but Khidr by his mystical perfection. He acquired a dual personality, one of which under the name of Elias wanders up and down the world until the last Day, and the other is al Khidr and lives at the bottom of the sea. The two meet twice a year to exchange confidences. Al Khidr is identified by Christians with St. George.

The Apostolic succession led to a further development of a spiritual hierarchy, in which those who acquire grace in this world are included. The Head of it is the Qutb or the Axis, and below him are 7 Abdal, 40 (others say 70) Negaba, and 300 Naqaba. Another form of the tradition is that God has made on earth 300 men in the likeness of Adam, 40 in that of Moses, 7 in that of Abraham, 3 in that of Michael and one in that of Asrafel.

Those who belong to the hierarchy have the gift of "*baraka*" (which may perhaps be interpreted Grace), and hand on the "*baraka*" to their spiritual descendants.

The cult which began with isolated teachers of asceticism rapidly grew into schools of mysticism deriving their authority from the recognised sources of Islam, and from them came the *Tariqas*. The head of the *Tariqa* is endowed with the *baraka*, which may be imparted more or less to his followers, who make themselves worthy by practising the special methods of the *Tariqa*. But since it is not for all to live the ascetic life, the *Tariqas* for the most part form congregations of religiously inclined persons combined by a common faith in the efficacy of the teaching of one particular school or teacher, practising a common ritual to their mutual benefit.

The ritual consists in the *Zikr*, or remembering the name of God. As an explanation, the following is a description of the "*zikr*" of the Qadria *Tariqa*,—"It is an effort to conquer space and time and discover the unknown. Whilst the lips repeat the formula revealed to the leader and their fingers turn their rosaries, the followers are calling on God, watching their heart beats as if at any moment thereby they might unveil the Divine Spirit.

Once a week on Friday they meet together and concentrate their minds on one idea, the Majesty of God, under the leadership of

the head of the *Zawia*, (if such there be), and recite several times the litanies and invocation appointed. Then under the direction of their leader they turn their heads to the right and say *Allah*, and then to the left and say *Allahu*, and then lower their heads and say *Allahi*, and continue to do so swiftly until they become quite hysterical. In the collapse that follows they see visions and receive inspirations".

The litany referred to above is of two sorts, *alwird al kabir* or *wird al waqt*, and the simple form, *wird al sughayir*. A specimen of the former is:—

100 times God Pardon
 100 times God be exalted.
 100 times God mayest thou spread thy blessing over Our
 Lord Mohammed and his companions.
 500 times There is no God but God.

The simple litany consists in saying 165 times after each prayer "there is no god but God".

The "*zikr*" may be of the voice, of the "heart", or of all the organs combined; that is to say that there are higher grades in which the mystical idea is more predominant, but for practical purposes the higher grades are only possible in the professional ascetic. The ordinary members of a *Tariqa* are contented to go through the first ritual of the voice. This satisfies an emotional need, and provides a common bond of worship with the fellow members of the *Tariqa*, that takes the place of Church membership in the West.

The *Tariqas* by virtue of their apostolic succession and the length of their tradition have a special status; but there are similar fraternities which either have not yet acquired the status, or make no pretensions to being more than reforming movements, or again they may depend on a special article of faith not accepted by Islam in general, or indeed they may be frankly heretical but still need to be noted in an examination of these Islamic fraternities.

The *Tariqas* are divided into five main classes, from each of these there have been many offshoots and derivative organisations. The five are the Qadria, the Khalwatia, the Shazlia, the Naqshabandia, the Saharawardia.

CHAPTER II.

TARIQAS IN THE SUDAN.

The number of *Tariqas* existing in Islam is considerable. One author alone gives fifty names, but the number of *Tariqas* that have any following in the Sudan is comparatively small.

It is proposed then to adopt the arbitrary classification of the last chapter and trace in each case the *Tariqas* of the Sudan if they exist.

1. The Qadria.

This *Tariqa* was founded by Muhi El Din Abu Mohammed Abd El Qader El Jilani Ibn Abu Saleh Musa El Hasani. He lived from A.D. 1079—1186. He was born at Jil or Jilan a province of Persia on the Caspian Sea. He was in charge of the tomb of Abu Hanifa Naaman and was an indefatigable missionary, a savant and an ascetic. His doctrines included self-abnegation to the profit of God, an ascetic mysticism amounting almost to hysteria, a wide and eclectic philanthropy and charity, piety and humility. He derived his mystical descent from Abu El Qasim El Goneidi. The *Tariqa* is to be found in Iraq, Syria and Constantinople. It has a considerable following in Arabia, and is most widely found in Turkestan, India, and the Dutch East Indies. There are also *Zawias* in North Africa. The present head of the Founder's family is Sayed Abd El Rahman and he is president of the Council of Ministers under the new Arab Government of Iraq.

This *Tariqa*, the first to appear in the Sudan, was introduced by Taj El Din El Bahari in the time of the Fung Dynasty, about the 16th Century A.D. The Arab tradition of the first introduction of the *Tariqa* is as follows: When Sheikh Taj El Din began preaching, there were many appeals for initiation into the new ideas. He agreed to initiate all those who were prepared to have their throats cut immediately after the ceremony. Four individuals were found with sufficient hardihood to face the ceremony, and brought to the tent of the Sheikh. Then the first was led aside and there was the sound of a gasp and a gurgle, and after an interval, another was introduced. Of the remaining three, one lost heart and fled though he was subsequently forgiven and inducted, but the three

who stayed found that the expiring noises were only those of sheep that were sacrificed to celebrate the occasion. The four Khalifas were Mohammed Amin Ibn Abd El Sadiq whose followers, known as the Sadiqab are still to be found at Suki between Medani and Gedaref, Ban El Naqa Abd El Yaqub, founder of the Yaqubab, Agib El Manguluk of the Abdallab and Abdallah El Araki of the Arakiin.

As time went on the purity of the faith declined and required the impulse of a reformer to purify it. Such was found in Sayed Ahmed El Bedawi who died at Tanta in A. D. 1276. He was of a Hedjazi family and born at Fas and had been educated at Baghdad. He began his mission on the Nile and was specially notable for securing the fecundity of women. He earned a great reputation for miraculous power in arms when his followers defeated the soldiers of Louis IX at Faraskur.

The Desuqia or Ibrahimia is an offshoot again of the Bedawia. The *Tariqa* was started by Sayed Ibrahim (born A. D. 1366) at Desuq in Lower Egypt. On his death his disciples gathered around his brother Sheraf El Din Abu El Imran under the title of Ibrahimia.

The Bayumia was founded by Sayed Ali Ibn El Hedjazi Ibn Mohammed. He was born at Bayum in Egypt A. D. 1696 and was originally of the Khalwatia. He set himself to reform the Bedawia and the impulse that he gave the sect started a separate *Tariqa*, but the distinction between Bayumia and Bedawia is now practically lost.

Representatives of these offshoots of the Qadria are to be found in the Sudan but not in influential numbers or personalities.

2. The Khalwatia Tariqa.

The formation of the Khalwatia or Anchorites was due to a revival some hundred years after the rise of the Qadria. The originator of the movement was Mohammed El Khalwati, but the acknowledged head of the order was his disciple Omar who died at Cæsaria in A. D. 1396. The evolution of the Khalwatia covered two periods. The first lasted some 500 years during which fraternities were established in Asia Minor, Turkey, the Hedjaz and India and with the lapse of time they tended to split off or die away. In the 18th Century the *Tariqa* entered on a new lease of life inspired by Sayed Mustafa Kamel El Din El Bakri El Siddiqi, a learned professor of the Azhar University. Born at Damascus in A. D. 1733 he was

educated in Jerusalem and travelled widely in Islamic countries. At Constantinople he had a vision of the Prophet and thenceforward began his call.

One of the groups which formed at his death and acquired a new name was of considerable importance to the Sudan. This was the Sammania.

This *Tariqa* was started by Sayed Mohammed Abd El Karim but was introduced into the Sudan by El Sayed Ahmed El Tayeb Walad El Bashir who died in A. D. 1823 and was buried at Gebel Gerri. The *Tariqa* had a tremendous reception when it first came and to this day has a very large following. The most important family of its adherents is that of Mohammed Sherif Pasha Nur El Daim who was head of the *Tariqa* under Turkish rule and whose disciple the Mahdi was until the latter broke off and started his Jihad.

The family still resides at Eilafun, Blue Nile Province.

The present head of the *Tariqa* is Sayed Mohammed El Samman and is normally resident at Medina but during the war he escaped from Medina and took refuge at Aleppo. After the war he came to the Sudan where he had visited his followers on a previous occasion. He has expressed a determination to remain in the Sudan permanently though he has returned to the Hedjaz for the time being (1921).

A distinguished leader in the Sudan is Sheikh El Hagu Wad El Masia, a Fellati (West African) living near Sennar and possessing very great influence with his compatriots.

El Tigania is kindred to the Khalwatia. The order was founded late in the eighteenth century at Fez on a fanatical and militant basis. In the first half of the nineteenth century its influence was carried over Tunisia, the Sahara and as far as Timbuktu. Its adherents in the Sudan are found chiefly among the Hausa and Fellata, and among the tribes of Darfur and Western Kordofan.

The order was introduced into the Sudan during the last years of the old Egyptian Government by Sayed Mahmud Wad El A'alia who came to Berber with Zein El Abdin El Maghrabi. After the death of the latter and as a result of a dispute with his relations Wad El A'alia left Berber for the Jaalin country where he married and acquired large landed properties.

The influence of the *Tariqa* in Darfur and Kordofan was due to certain influential *Khulafa* who had settled there. Omar Ganbo,

a Hausa was a disciple of Mohammed El Sughair Ibn Sayed Ali of Temsen, a disciple of the founder. He travelled widely over the Western Sudan, Egypt and the Hedjaz and lived for a time at El Fasher under the auspices of Ali Dinar, but he came under suspicion of using witchcraft to cause the Sultan's illness and fled from Darfur in 1908. He spent the rest of his life in El Obeid and Omdurman with occasional visits to Mecca where he had a household. He died in 1918 at Mecca.

Another leading personality in Kordofan is El Fiki Dardiri who resides at Khursi near Bara.

3. Shadhiliya Tariqa.

The founder of this Tariqa was reputed to be Sho'aib Abu Midian El Andalusi. He was born at Seville A. D. 1126. He was a disciple of Sheikh Abdel Qader El Gilani. His doctrines were spread first by Abd El Salaam Ibn Mashish and later throughout North Africa and the East by Sayed Hassan El Shadhli Abu El Hasan Ali Ibn Abdullahi Abd El Gabbar. This last was born probably at Ceuta A. D. 1196. His doctrines were more mystical than those of his predecessors but his ritual less elaborate; in fact simplicity was the keynote of his teaching. (1) He died in A. D. 1258 somewhere in the Atbai Desert while returning from Mecca. As the exact spot of his death was unknown there was no apostolic succession but a number of descendant communities are derived from the Shazlia as they were founded by learned men who belonged to the *Tariqa*.

One of these is the Magzubia, a *Tariqa* which was at one time of great importance in the Sudan and still has a following. It was started in the Sudan in the early 18th century by Sheikh Mohammed El Magzub "El Kabir" of the Magzub branch of the Jaalin, whose son Hamed El Magzub, is said to have been the founder of Damer, and who enjoyed a great reputation in the Sudan. The *Tariqa* received further impetus from the great grandson of the founder, Mohammed El Magzoub El Sughair. He was born at Metemma A. D. 1796. Descriptions of the conditions of El Damer in the

(1) Some of the *Hudendoa* state that his tomb is at Halus a place some thirty miles inland from Halaib on the Red Sea—there is also the burial place of "el Sheikh el Shazli" at Id el Hashab which is halfway between Halaib and Derr, and some e.g. the *Eleigat* believe this to be the place of his death.

early 19th century shew it as a hierarchy completely under the influence of El Magzub.

During the reprisals on the Jaalin consequent on the murder of Ismail Pasha at Shendi, El Magzub fled to Suakin and went thence to Mecca where he studied for ten years under Sayed Ahmed Idris. On his return to the Sudan about 1830 he preached at Suakin and spread his influence amongst the Eastern tribes.

Among his Khulafa was Sheikh Yasin of Suakin and Sheikh Ali Digna the uncle of the famous Osman Digna. He returned to his village about 1832 and died and was buried there the following year. He had two daughters one of whom married his nephew Mohammed El Taher El Magzub. There was no issue of this marriage and the succession passed through the other daughter who also married her cousin and had several children, one of whom Mohammed El-Magzub died in Omdurman as one of the Omana of the Khalifa Abdullahi.

Mohammed El Taher El Magzub had male issue by a Hadendoa woman and his son Mohammed El Magzub the third was the adviser and secretary to Osman Digna. He was present at the battles of Atbara and Omdurman and then surrendered to the British Army. He now lives at Homar Abdeleib and is widely known for his learning, piety and straightforwardness (1921). Two other descendants of Mohammed El Magzub (the first) still survive. Mohammed Abu El Hasan in charge of the old Mosque of El Damer and Abdulla El Nagar in charge of the new mosque in the same place. The followers of the *Tariqa* are distributed amongst the Jaalin, Hadendoa and Suakinese and some Bishariin.

Ahmedia or Idrisia.

Sayed Ahmed Ibn Idris known as El Fasi who was the teacher of Mohammed El Magzub as has been described above was important not only as the founder of a *Tariqa* himself but as the teacher of a number of prominent religious personalities. He was born at Araish in Morocco but was brought up and educated in religion at Fez (El Fas) and adopted the *Shadhliya Tariqa* from Sheikh Abdel Wahab El Tazi. He went to Cairo in 1788 and thence to Mecca in 1797 where he taught for many years. He died at Sabia in the Yemen in 1837.

His *Tariqa* should be distinguished from the Ahmedia of Sheikh El Bedawi of Tanta. The present head of it is Sherif Mohammed Abd El Mutaal the grandson of Sayed Ahmed Idris. He lives at Cairo and Darau. His son Sayed Mirghani at one time lived in the Sudan but has latterly lived almost entirely in Cairo. A younger brother Sayed Idris lives at Argo (Dongola Province) and has recently married there. The tomb of Sayed Abdel Mutaal the father of Sherif Mohammed is at Dongola El Ordi and the annual celebration of his death (Holia) is held there and at Omdurman.

It is alleged that Sherif Mohammed Abdel Mutaal had an ambition to combine the Mirghania and Sennoussia under the Ahmedia on the grounds that the originators were pupils of his ancestor, but the claim is only a formal one and has no existence in fact.

Sayed Mohammed Idrisi the well known religious and fighting leader in Asir is another descendant of Sayed Ahmed Idris (Mohammed is the son of Ali, the son of Mohammed the son of Ahmed Idris). His brother Sayed Mustafa was educated by Sherif Mohammed Abdel Mutaal at the Azhar University. He has a house and wife at Artigashi (Dongola Province) but has been in Asir for some years.

The reputation of Sayed Ahmed Idris for learning and piety was very great and he numbered amongst his pupils, Sayed Mohammed El Sennoussi, Sheikh Mohammed El Magzub, Sheikh Ibrahim El-Rashid and Sayed Mohammed Osman El Kabir, all of whom made their mark in the world of Islam in later life.

The Mirghania or Khatmia.

This is the best known and most widely distributed *Tariqa* in the Sudan at the present day.

The founder was Sayed Mohammed Osman known as El Kabir to distinguish him from his grandson. He was born at Salama near Taif in the Hedjaz 1787. He traces his descent to El Hussein son of Ali Ibn Abu Talib.

The name of the *Tariqa* is derived from Sayed Ali Mirghani, the seventh great grandfather of Mohammed Osman. "Mirghani is derived sometimes from Emir Ghani", the wealthy Emir, but this may be but another instance of the Arabic habit of "canting" etymology. There is a tradition that the family was domiciled at one period in Khorasan.

Sayed Mohammed Osman began his studies in Mecca and finally adopted the principles of four *Tariqas* and combined them into one with his own modifications. The initials of these four *Tariqas* and his own made the expression Naqashgam which became the symbol of the *Tariqa*, Naqshabandia, Qadria, Shadhlia, Goneidia, Mirghania,

He then began his travels. He went through Upper Egypt from Assiut to Assuan and then proceeded to Dongola and there gained many adherents. Thence he went to Kordofan, where he married a native of Bara and two of his children Ibrahim Taj El Khatim and Ahmed died and were buried at El Obeid. Sayed Mohammed El Hasan the third son of this wife became later one of the leaders of the *Tariqa*. He then passed through Sennar which was under the rule of King Badei and later turned to the North. After passing through Shendi and Metemmeh he turned Eastwards to Goz Regeb and Kassala and in this last place he founded the village of El Khatmia which afterwards became the headquarters of the family.

He continued his travels to Sabderat and Massawah and returned to the Hedjaz via Suakin and Jeddah. He died in Mecca in 1851.

He had issue, according to the records no less than 70 persons. Upon his death his eldest son Mohammed Sirr El Khatim tried to carry on his work but was hampered by the jealousies of his brothers. He sent his sons forth to preach the good word. The eldest Mohammed Sirr El Khatim went to Egypt and died there in 1917 and is succeeded by his son Mohammed Abu Bekr. The second son went to Khartoum North and died there. The third son who is buried at Suakin was the husband of Sitt Miriam, the daughter of Sayed El Hashim, a younger son of Sayed Mohammed Osman El Kabir.

Sayed Mohammed El Hasan, referred to above, who was born at Bara settled in the Eastern Sudan and continued the work begun by his father at El Khatmia. His son Sayed Mohammed Osman, known as El Sughair to distinguish him from his grand-father was very active in forwarding the interests of the *Tariqa* and being a man of intelligence and ability won a prominent place for himself in the history of his period. His two sons Sayed Ali and Sayed Ahmed are the present leaders of the *Tariqa*. The former, born of an Arab mother, has the greater prestige. He was educated in Egypt. He lives chiefly in Omdurman and Khartoum and he has agricultural land at Bauga. He was honoured in 1900 with the

C. M. G. and later in 1916 with the K. C. M. G. and was the head of the Sudan Delegation to H. M. King George V in 1919 where he received the K. C. V. O. He married Fatima the daughter of Abdallah El Mahjub. (*see ante*).

Sayed Ahmed lives at Kassala. His mother was an Abyssinian concubine. He married Ayesha the daughter of El Bakri, a grandson of Mohammed Osman El Kebir. He received the order of M. B. E. in 1918. Sayed Gaafar, brother of Ayesha is the representative of the *Tariqa* in Eritrea and lives chiefly at Keren.

Under Turkish rule the *Tariqa* acquired considerable official support and its demands on the contributions of the faithful were thought vexatious. Naum Shoucair in his History of the Sudan makes this fact a contributory cause to the success of the Mahdi's movement. Sayed Mohammed Osman denounced the Mahdi as an impostor but as the revolt spread found it necessary to withdraw to Egypt whither he took his son A'i. Sayed Ahmed remained in the Sudan in charge of Sayed El Mekki. (*see below*).

The *Tariqa* is very widely spread throughout the Eastern and Northern Sudan. It is known alternatively as the Mirghania or the Khatmia.

An offshoot of the Mirghania is the Ismailia. The founder of this sect was Sayed El Mekki, a religious leader who played a prominent part during Mahdism and was greatly trusted by the Khalifa Abdullahi. It had its headquarters at El Obeid and spread over the Western Sudan into Darfur. Sayed El Mekki died in 1906, leaving a number of sons and a grandson Sayed Mirghani who was the head of the family by seniority of descent. Disputes arose between uncles and nephew as to the leadership of the *Tariqa*, owing to his youth, and there were occasional affrays between the adherents of different members of the family. Sayed Mirghani lives chiefly at Omdurman and visits El Obeid annually.

El Rashidia.

The founder of this *Tariqa* was Sheikh Ibrahim El Rashid. He was of the Dueih, a section of the Shaigia from Dongola. As previously stated he was a student of Sayed Ahmed Idris and he adopted the doctrines of the Ahmedia. His followers are to be found in Dongola, Omdurman, Tuti Island and in the White Nile

Province chiefly at Kawa. There are also followers in Somaliland and Syria.

The founder is buried at Mecca. Sheikh Mohammed Saleh his nephew died in 1919 also in Mecca and the present Khalifa is his son El Rashid.

The chief followers in the Sudan are:— Sid Ahmed Ibn Haj Abdallah El Dufari, leader of the Zawia at Kawa: Sheikh Mohammed el Tagalawi in Omdurman has a mosque and *Zawia*: in Shendi District at Salama there is a well known leader Said Ibn Sheikh El Amin.

Another confraternity which claims kinship with the Shadhliya is called the sect of Abu Jarid, but owing to its reputedly heretical views is better known as the sect of Zabala or 'the deceived ones'. The founder was Sheikh Bekr and he and his chief disciple Abu Jarid began their mission early in the 17th century. Their *Zikr* is kept secret and they are accused of indulging during it in promiscuous intercourse, but this may not improbably be the common attribution of evil to any secret society. The present Khalifa Sherif El Imam Ibn Busati lives near Singa and claims to be a descendant of Abu Jarid. (*See Sudan Notes and Records Vol. I, page 176*).

4. El Naqshabandia.

This *Tariqa* was founded by Abd El Din Ibn Mohammed Beha El Din El Bokhari El Naqshabandi. He was born at Ksar Arifan or at Hendawan near Bokhara circa A. D. 1316. He was originally a member of the Awissia sect and started his *Tariqa* with the object of reforming Islam.

The *Tariqa* in its original form is not extant in the Sudan but is one of the bases of the Khatmia *Tariqa*. (*see ante*).

5. El Saharawardia.

This *Tariqa* was founded by Sheikh Shehab El Din Abu Hafa Omar Ibn Mohammed Ibn Abdullah. He was born in A. D. 1144 and died at Shahraward near Zendjan in Iraq. Its main characteristic is extreme mysticism. It does not occur in the Sudan.

CHAPTER III.

Some Parallel Organisations.

There are certain sects or confraternities which are not, or were not in their beginning, *Tariqas* but have acquired very similar characteristics and are of influence in the Sudan as such.

Undoubtedly the most important of these in the Sudan is the great movement started by Mohammed Ahmed generally known as El Mahdi. Mohammed Ahmed was born at Geziret Darur 1848 and early made his mark as a religious enthusiast. He attached himself to the Sammania *Tariqa* and was the pupil of Mohammed Sherif Nur El Daim. As one of the *Ashraf* of Dongola he started with an hereditary reputation which was rapidly enhanced by his piety and asceticism, and he began to prove a serious rival to his teacher's ascendancy. It is said moreover that the private life of Mohammed Sherif Nur El Daim was not above criticism and his pupil did not hesitate to inveigh against his worldliness and loose morality. Whether the causes were personal jealousy, pique or disapprobation of his pupil's designs, Mohammed Sherif Nur El Daim put a calculated and public affront upon Mohammed Ahmed and the latter left him and devoted himself to a period of asceticism, after which he began his mission. His first step was to get in touch with Sheikh El Ghurashi another leader of the Sammania, but his designs soon transcended a mere supremacy of *Tariqa* and, when he came to power, he repressed the *Tariqas*, and his successor the Khalifa Abdullahi definitely oppressed them.

The mission of Mohammed Ahmed El Mahdi was a dual one. The Sudan consisted of tribes ravaged by internecine warfare and worn out by extortion and oppression from their overlords. What was needed was some common bond which could combine the different tribes under one flag to cast out the oppressor and keep the people from destroying one another. That was found in the call of the Mahdi to reform the faith and enter on the preparation for the Millennium.

It is possible that many of those who joined the Mahdi were doubtful of the authenticity of his sacred mission but he represented the only hope of freedom and they accepted the call "for the chance

of escape from thralldom. His old teacher Mohammed Sherif Nur El Daim excommunicated him and was rewarded with the rank of Pasha. The Mirghania *Tariqa* that had the support of the Turks did the same, but it was soon clear that they could not withstand the rising tide of national success. Starting from incredibly small beginnings and inspired by a series of successes that it would not be unreasonable to call miraculous Mohammed Ahmed found himself in a few years master of the Sudan.

He did not however live long to establish the new regime. His rule inevitably took the form of the pure Mohammedan law and great stress was laid upon the execution of the religious duties of daily prayer. On the model of the Prophet Mohammed he selected four Khalifas, Abdullahi El Taaishi to represent Abu Bekr, Ali El Helu to represent Omar, Mohammed Sherif to represent Ali, whilst the fourth chair was offered to the Sennoussi. The last refused the offer and did indeed offer to oppose any encroachment of the Mahdist ideas by force. But there is a tradition that the chair was left vacant and one day the Sennoussi will take it and lead Islam to victory.

On the death of Mohammed Ahmed El Mahdi in 1885 the Khalifa Abdullahi assumed the reins of power and what had been a religious reformation inspired by hatred of oppression of the Turks very rapidly deteriorated into the despotism of a particular section of the population supported by a fanatical exploitation of the religious law. The Baggara and more especially the Taaisha robbed and blackmailed at will, but there was no one strong enough to combine the people and break the Khalifa's power. The Dongola and Nile expeditions however culminated in the smashing of the Khalifa's army at Omdurman 1898 and he himself was killed shortly afterwards at Um Debrekat.

During the rule of the Khalifa, the rules of asceticism and piety laid down by the Mahdi became distorted into instruments of oppression. No man could own anything, it was taken from him and put in the "*Beit El Mal*". The presence of a halfburned cigarette was evidence enough to induce a flogging that almost certainly caused death and even absence from the daily prayers was likely to cause a "delation" by some enemy with imprisonment or worse to follow. But this was not the spirit of the original

teaching of the Mahdi which, fanatical as it may have been, was genuinely religious and indeed contained within it unexpectedly progressive elements. His *Ratib* or prayer book remains and is widely used by his followers throughout the Sudan. A learned Mohammedan lawyer writes thus upon it :— It is all invocations to God to lift darkness from the heart and to throw light upon it. I was greatly astonished to find that it was void in every respect of any call to Mahdism and I began to think his object was to call the people to follow him as Sheikh of a *Tariqa* and not as the Mahdi.

The Mahdist sect is distributed chiefly over the White and Blue Nile and Fung Provinces. It has too, many followers amongst the Baggara from the Nuba Mountains through Kordofan into Darfur. The followers include many people of a fanatical type and not the least among them are the Fellata who are scattered throughout the Sudan.

The present leader of the sect is Sayed Abd El Rahman El Mahdi the eldest surviving son of the Mahdi. He is a posthumous child. His mother was a native of Darfur and he is said to bear considerable facial resemblance to the Mahdi. He was brought up under the tutelage of the Mufti Sheikh El Tayeb Hashim and his brother Sheikh Abu El Gasim, President of the Board of Ulema. Upon the outbreak of war with Turkey in 1914 he hastened to express his loyalty to the British and declared that now the only difference between the British and the Mahdists had been removed. The Mahdi had ejected the Turk from the Sudan and the British had restored order by force of arms; but by their declaration of war against the Turks they now dissociated themselves from the old enemy. Sayed Abd El Rahman was a member of the Sudan Delegation to England in 1919 and was honoured with the order of C. V. O. He presented to H. M. King George V the sword of his father and His Majesty returned it to him to hold and use in the defence of himself and his Empire.

The Sennoussia.

Another great reforming movement of Islam was that of the Sennoussi. Mohammed Ali El Sennoussi was born at Mostaghanem in Algeria in 1791. Owing to the differences with the Turkish

authorities he fled to Fez and there became the pupil of Sayed Ahmed Idris and adopted the *Shadhliya Tariqa*. From Morocco he returned to Algeria in 1822 and thence went to Egypt but finding his teaching unacceptable there he went on to Mecca. When Sheikh Abd El Mutalib of Mecca began his revolt there, El Sennoussi was implicated and he returned to Egypt in 1843 and Abbas Pasha offered him a home in Cairo. He refused this however and made his way to Lybia settling at Jaghbub some 400 miles west of Cairo and he died there in 1859. He was succeeded by the elder of his two sons Mohammed El Mahdi. He, alarmed by the interest the Sultan of Turkey began to take in his affairs, retired in 1895 to Kufra; his brother Mohammed Sherif died the following year at Jaghbub. In 1899 Mohammed El Mahdi left Kufra and moved to Geru probably again to avoid outside interference. Here however he found himself confronted by the expansion of French colonisation in the French Sudan and his followers came into conflict with the French both in Wadai and North of Sokoto. Several battles were fought in 1901 and 1902 to the disadvantage of the Sennoussists and then he died in 1902. He left two sons Mohammed Idris and Mohammed Rida the eldest of whom was only thirteen, so the control of the sect was taken over by Sayed Ahmed El Sherif El Hassanieh Khatabi El Idrisi, their uncle and the nephew of the great Sennoussi. He retired in 1903 to Kufra taking with him the body of Mohammed El Mahdi and there established himself. In 1908 a Turkish mission found its way to Kufra with presents and the offer of a flag and though the latter was refused it was the beginning of a closer rapprochement between Turkey and the Sennoussists. In the Italo-Turkish war Sayed Ahmed El Sherif was much influenced by Enver Pasha and when peace was made between the belligerents he maintained hostilities against the Italians with some measure of success. After the outbreak of the Great War under Turco-German pressure Sayed Ahmed accepted help from the Turks and prepared to fight both the Italians and Egypt. His nephew Mohammed Idris however disagreed with his policy and wished to secure the leadership of the sect to which his birth entitled him.

Sayed Ahmed's disastrous expedition against Egypt which ended in his complete discomforture at the end of 1916 seriously impaired his influence. Mohammed Idris made an agreement with the Italian

and British Governments and insisted that Sayed Ahmed El Sherif should either submit or retire to Kufra. The latter did retire to Syrt, but subsequently contrived to get away to Constantinople. Later he joined the Kemalists and is now supposed to be at Mosul as a possible candidate for the throne of Mesopotamia (1921).

Mohammed Idris has visited Rome and is now actively interested in the formation of a Tripolitan Parliament.

The Sennoussist movement began as a reforming one and as is nearly always the case in Islam it was a retrogressive move, i. e. an attempt to reproduce the conditions of the past with a strict adherence to the letter of Islamic law. The followers were very suspicious of strangers and completely intolerant of non-Mohammedans. A curious feature was the growth of a custom of drinking tea (coffee they did not permit) which amounts almost to a ceremonial. It is drunk very strong and very sweet and special brands are imported. Situated where it was, the sect was able to reproduce the conditions of early Mohammedanism but as has been seen above the pressure of the outside world has been too insistent and the movement has latterly sacrificed its religious to its political side. Nevertheless the religious element is a very strong one and still remains a serious element in the Sahara among the nomad tribes.

The connection of the Sennoussia with the Sudan is but slight. After the Sennoussi rejected the Khalifaship offered him by the Mahdi, their relations were naturally strained and it was not till after the battle of Omdurman that the Sennoussi influence began to appear and then only in Darfur. Sultan Ali Dinar was too clever to make an enemy of so powerful a neighbour and at the same time did not wish to involve himself in complications or to endanger his own peace. He permitted the establishment of two *Zawias* in Darfur, but the movement never had any hold on the natives and was confined to immigrants from Wadai or the Western Desert.

Azmia.

This sect was started by a certain Mohammed El Madi Abu El Azaim. He was born about 1852 at Desuq. He went thence to Mataharieh (Minieh Province) and this is now the seat of the sect. He entered the Egyptian Education Department in 1893 and served in Edfu, Aswan and Suakin, and was transferred to the Sudan

Education Department in 1902. He was stationed at Halfa and later at Omdurman and Khartoum and he started a centre of his mission at Burri. His brother Ahmed was an educated man and was stated to have been manager of the Moayad newspaper until it got into the hands of Sheikh Ali Yusef. He died about 1911 and some of his works were published posthumously, amongst which was a book called Wasail Izhar El Haq issued in 1914 and containing a violent attack on Christianity.

To Sheikh Mohammed El Madi are attributed two books: "The First Principles of following the Prophet" and "The Azmia *Tariqa* and Heavenly inspirations".

Strictly speaking he is a reformer and not a leader of a *Tariqa*. His teaching is that sanctity is not a matter of heredity and he adopted strict rules of life similar to those of the Wahabi sect; so much so that the Sect has been called (though erroneously) Wahabite. Ostensibly he desired to destroy the influence of the hereditary religious leaders and put the authority into the hands of those whose piety and asceticism deserved it. He opposed the *Tariqas* as such, but has only succeeded in forming another.

The Education Department dispensed with his services at the end of 1915 and he went back to Egypt and lived at Minieh.

In October 1915 there was a slight disturbance over a certain Abd El Rahim, who was a pupil of Mohammed El Madi, at Sinkat. The trouble arose over interference with a funeral. Mourning for the dead, and the building of tombs or any veneration for the dead is contrary to the tenets of the sect.

In April 1921 the Sect was reported to have held a meeting at the Mosque of Sayed Abd El Rahman Abu Hummus, at Alexandria, under the Presidency of Sheikh Amin El Azmi El Azhari.

A NOTE ON THE RUFF.

Machets pugnax.

A bird found at Wad Medani, Sudan.

BY J. E. M. MELLOR, M. A., (Cantab).

Member of La Société Entomologique de France.

Towards the end of December 1920 ruffs and reeves (the females) appeared in the country around Wad Medani and were still present in large numbers at the end of February, 1921, when I left to proceed on leave to England. In the early mornings and in the evenings flocks of from forty to a couple of hundred could be seen flying over the cotton and unwatered durra lands near the Gezira Research Farm.

The ruff is a wader and, though it has been recorded as eating rice in India and boiled wheat when being fattened in captivity in England, its natural food consists of insects and their larvae, worms and molluscs and seeds of aquatic plants. It is, therefore, interesting to note that the birds around Medani devoured durra and that those which I shot and examined showed no trace of having eaten other food.

In the early mornings between 6.30 and 8.30 in February I have seen flocks of these birds flying over the crops on the unwatered durra lands. At that time the grain had nearly all been harvested and either lay in the heads in dumps ready to be thrashed, or had been thrashed and was being carried in sacks on the backs of camels or donkeys to the owner's village or to Medani market.

The birds found plenty of grain around the dumps and thrashing floors and were also to be seen on the tracks by which the grain was being transported, greedily devouring any grain which had fallen from the backs of the laden animals. When a group of natives or of camels approached, the flock would simply rise and swirl backwards and forwards over the crops until the disturbers of their peace had passed, when they would at once hasten back to the interrupted meal. Their movements were full of greed and the eagerness and rapid movements of starlings feeding on English pastures.

I found it easier to approach them mounted than on foot but even on a pony they did not allow me to get within thirty yards, even though I approached sideways and as if my attention was busy elsewhere.

The flocks seemed to begin to leave the cultivations between 8.30 and 9 in the morning but to return again in the evening from the direction of the Nile.

In the evenings I have seen many small flocks manoeuvring over cotton gradually unite to form one great flock, which would at one moment bunch together in the air not covering more than twenty yards and at the next stretch out from the centre into a long string over a hundred yards in length.

They would continue these evolutions until dark. I have often seen these birds settle on fallow and ploughed land both in the morning and in the evening and they are then very difficult to see as their colour tones with the ground.

The first bird I shot was killed in the evening from a flock of less than twenty birds on fallow land over which grain had been carried. It was so dark that I could only see grey forms flying swiftly and silently away along the ground and only found the dead bird with the help of a dog.

The other birds which figure in the table showing crop content were shot from a flock which was stretched out along the water's edge of a main canal on the Gezira Research Farm. There was no sign that any food other than durra had been eaten. Some of the birds were simply gorged with grain right up into the bill.

The birds shot on 6th. February had begun to moult.

Table showing contents of Crops and Gizzards of Ruffs and Reeves shot on the Gezira Research Farm, Wad Medani.

No.	Date	Time	Place	Sex	Crop	Contents Gizzard Remains of about	Total Durra grains
39	10. 1. 21.	6.00. p.m.	Fallow	Female	111	3	114
40	6. 11. 21.	7.30. a.m.	Canal Bank	Male	17	22	39
41	"	"	"	Male	13	3	16
42	"	"	"	Male	206	22	228
43	"	"	"	Male	85	14	99
44	"	"	"	Female	90	11	101
45	"	"	"	Female	11	8	19

GEOGRAPHICAL DISTRIBUTION.

The Ruff comes to the Sudan as a winter migrant.

Sharpe and Dresser (1) give its range as the whole of Europe except in the extreme north, and in Asia as far east as Kamtschatka and say that it winters in Africa as far south as the Cape of Good Hope.

Capt. Shelley (3) says that it is abundant in Egypt and Nubia especially in the Fayoum and the Delta from August to May preferring the flooded fields to the marshes. Von Heuglin (1) observed it at all seasons in N. E. Africa and in April 1862 S. W. of the Gazelle River from July to August also near the bitter lakes N. of Suez. Akerman (1) records it from East Kordofan and in Abyssinia at an altitude of 10,000 feet. It has also been observed in the damp parts of Algeria chiefly in the winter and in Tangier only when migrating to Europe in March or returning thence in July, August and September.

Blandford (4) says it is rare East of India, but in the cold season is common in Northern India, rare in the South, in Ceylon and generally in Assam and Burma.

It used to breed in Norfolk and other parts of England and Montagu (2) gives a most interesting account of the methods used for netting it in the fenlands and of the way in which it used to be fattened for the London markets. About 1767 a consignment of twenty seven dozen Ruffs, intended for the Lord Lieutenant of Ireland was taken across England from Colnstone in baskets upon two horses. Seven dozen were left at the Duke of Devonshire's at Chatsworth the remainder going on to Holyhead, seventeen dozen being delivered alive at Dublin Castle.

DESCRIPTION.

Male in Spring—face covered with yellowish warty pimples; back of the head with a tuft of long feathers on each side; throat furnished with a ruff of prominent feathers; general plumage mottled with ash, black, brown, reddish white, and yellowish; but so variously, that scarcely two specimens can be found alike; bill yellowish orange.

Male in Winter—face covered with feathers, ruff absent; under parts white; breast reddish, with brown spots; upper plumage mottled with black, brown and red; bill dark brown, paler at the gape. Length of male about 12 inches (4)⁽¹⁾ Tail 2.75. Wing 7.3. Tarsus 1.9. Bill from gape 1.5.

Female "The Reeve" — long feathers of the head and ruff absent. upper plumage ash-brown, mottled with black and reddish brown. Length 10 inches; tail 2.25; wing 6 tarsus 1.75 bill 1.4. (4)⁽¹⁾

In both sexes tail rounded, the two middle feathers barred; the three lateral feathers uniform in colour.

Legs and feet fleshy yellow to yellowish brown in adults. Olive-green to leaden gray in young.

REFERENCES.

- (1) Sharpe and Dresser 1871—1881. History of the Birds of Europe Vol. 8. pp. 87—97.
- (2) Montagu, Ornithological Dictionary, 2nd Edition, pp. 440—446.
- (3) Shelley, Capt. Birds of Egypt. p. 240.
- (4) Blandford 1898 Fauna of British India, Burma and Ceylon—Birds Vol. IV. p. 270

(1) *Note.* Having no bird shot in the Sudan with me when writing these notes I have given Blandford's measurements.

**RIGHTS, DUES AND CUSTOMS PREVAILING
AMONG ARAB TRIBES IN THE
WHITE NILE PROVINCE.**

BY C. E. LYALL.

The following is an account of some of the tribal customs of the Arabs, nomad and sedentary, relating to land and movable property.

The rights of the Nazir or Head Sheikh were and are quite distinct from the rights known as Fitra and Zaka, though they are sometimes called by those names, especially in Kordofan amongst the Baggara, - I can remember that the Hawazma Sheikhs claimed Ushur as their rights calling it Fitra or Zaka or both from the natives other than Hawazma cultivating at Singikai—Fitra and Zaka were however really religious taxes payable to the Fugara or Religious Sheikhs for their own use or charity.

The following is the most reliable account I have been given of Fitra and Zaka.

(A.) **Fitra.** A poll tax of $5\frac{1}{2}$ rotls, for every person, slave or free, dependent on the head of the family, paid annually on the first day of the Ramadan feast. Whether the Sudanese call this month Fitr after the tax or the tax Fitra after the month is doubtful. Accordingly if a man had two wives, five children, and three slaves (a total of ten persons dependent on him) he would pay $53\frac{1}{2}$ rotls.

(B.) **Zaka.**

(I) Zakat El Nugud, tax of 5 per cent of money, or the value of gold and silver ornaments.

(II) Zakat El Eish or Zakat El Hubub, an ushur tax on every grain crop producing 1600 rotls or more. If the produce was less than 1600 rotls no tax was paid.

(III) Zakat El Mal a tax on animals, varying according to the kind of animal.

(a) Sheep and goats; one in forty or more up to 121, when two were paid: after 121 one sheep or goat was paid on every hundred.

(b) Cattle : at the following prices :—

For 30 to 40, one calf unweaned (*tebii*)

For 40 to 50, one calf, one to two years old (*tani*)

For 50 to 60, one calf three to four years old (*rubas*)

For 60 to 70, two *tebii*

For 70 to 80, one *tebii* and one *tani*

For 80 to 90, two *tani*

and so on for every 30 one *tebii*, for every 40 one *tani* e.g. 90 equals 30 plus 30 plus 30 i.e. three *tebii*, 110 equals 40 plus 40 plus 30 i.e. one *tebii* and two *tani*.

(c) Camels : at the following rates :—

From 5 to 20, one sheep for every 5 camels

For 25 to 36, one camel *walad* or *bint mukhad*

For 36 to 46, one camel *bil leben* yearling

For 46 to 56, one camel <i>higg</i> (or <i>higga</i> - fem.)	} two years to three years
For 56 to 70, one camel <i>jada</i> (or <i>jadaa</i> - fem.)	
For 70 to 80, two <i>bil leben</i>	} 4 years to 5 years
For 80 to 90, two <i>bil leben</i> and two sheep	

and so on for every complete 35 one *bil leben*; e.g. for 120 camels equals 35 plus 35 plus 35 plus 15 i.e. 3 *bil leben* and 3 sheep.

These religious taxes however do not appear to have been enforced by any sanction other than custom, the payment of them being in fact left to the conscience of the individual whose reputation and influence with his fellows would depend on whether he paid his customary dues in full or not.

With regards to the rights exercised or claimed by the Nazir, there seems to be no doubt that the custom, by which strangers paid to the Head Sheikh on the lands cultivated by them within the tribal boundaries, was universally observed, not only in the times previous to the establishment of the old Turkish or Egyptian Government, but also subsequent to the establishment of that Government. As proof of the statement that the old Turkish Government recognized this right the case of the Dueih may be cited; this case was mentioned by Sheikh El Dushein Abdulla in the enquiry into the dispute between Adam Ismail, Nazir of the Dueih, and the Hassania and Husseinat. It appears that the Nazir Sherg El Agaba complained to the authorities that Ismail Dud, the Nazir of the Dueih, was retaining for himself a large amount of ushur collected from his people, but on

the latter giving proof that this *ushur* was collected from strangers cultivating within his tribal boundaries, he was allowed to retain it.

As far as I have been able to discover the Dueih seems to have been the only tribe in which strangers paid to the Nazir a definite fixed sum according to the amount of their cultivation; in other tribes strangers paid to the Nazir according to the agreements made between each individual and the Nazir; the amount paid might be a third, a quarter, a fifth or a tenth of the crop. Strangers cultivating within the Dueih tribal boundaries paid at the following rates, for every 10 *ud rubai* of river or *ugud* land, one rial mejidi (about P.T. 15). (Note, *ugud* land is land in Khors or depressions where the rain water lies and which is cultivated as the water dries up). For every 20 *ud rubai* of ordinary rain land one rial mejidi. These taxes were known as *tugundi* and were paid to the Nazir at the time of sowing.

In addition there is also an *ushur* tax paid by strangers to the Nazir of the Dueih at the time of the reaping of the crop.

The custom observed in other tribes seems to have been that whenever a stranger came to the Nazir of the tribe and asked for some land to cultivate, the Nazir would allot him a plot out of the uncultivated land of the tribe which was considered the property of the Nazir for the time being, and at the same time make an arrangement as to the proportion of the crop to be paid as rent. Similarly if any member of the tribe wished to increase his cultivation beyond the land originally allotted to him and his family he would apply to the Nazir and pay rent on his additional cultivation according to the agreement made with him.

There is considerable doubt whether the Nazir had any claim over the members of his tribe in the form of dues on their cultivation. The probability is that all tribes were not alike in this matter, in some the right of the tribe existed and in others it did not.

In certain tribes it appears that full *ushur* was paid to the Nazir by members of the tribe. This seems to have been the case with the Dueih and the Kurtan; Ismail Dud however the father of the Nazir of the Dueih in 1908 gave up his right to *ushur* from the members of his tribe.

In other tribes the amount paid to the Nazir was in inverse proportion to the number of individuals working on the land of any member of the tribe; if for instance a land owner had ten or less labourers on his land he paid *ushur* to the Nazir, never more; if however he had more

than ten, the crop would be divided into equal shares of one more in number than the number of workers and the Nazir would be entitled to an extra share e.g. a man who had 20 labourers would divide his crop into 21 equal shares and the Nazir would take one share; the land owner keeping the remainder.

In other tribes no dues at all were paid to the Nazir by the members of the tribe in addition to the Fitra and Zaka paid to the *Fugara*. I am inclined to think that this was the custom originally prevalent and that the custom by which members of the tribe paid *ushur* or any other proportion of their crop to their Nazir crept in later, possibly among the smaller tribes at first in which the Nazir did not find that the rent received by him from strangers was sufficient for his needs.

There was also a third right exercised by the Nazir in relation to the property of members of his tribe and strangers alike; whenever an individual died leaving no heirs, his property, movable and immovable, became the property of the Nazir. Similarly if any individual, whether member of the tribe or a stranger, abandoned his land and left no relatives to succeed to it, his land became the property of the Nazir. On the other hand if a man died and his heirs were minors or for any other reason incapable of looking after the property to which they had succeeded it was incumbent on the Nazir to assist them until they were capable of doing so.

In those tribes where the right of the Nazir to a proportion of the movable and the immovable property of the members of the tribe was recognized, a change occurred with the establishment of the Turkish Government. When the latter demanded taxes or tribute from the tribes, it was recognized that it was a considerable hardship to expect a tribe to continue to pay its former dues to the Nazir in full and at the same time pay the new taxes to Government.

In some cases therefore a compromise was come to by which while the Government taxes were paid, the Nazir's rights over the movable and immovable property of the members of his tribe were commuted for a more or less definite sum of money imposed on the tribe in addition to the Government taxes; for instance, if the tribute on a tribe was assessed at £E. 1000, this sum would be levied on the tribe with an additional sum, say £E. 200, which the Nazir would take for himself in lieu of the rights formerly exercised by him.

With the establishment of the present Government in the Sudan the

Nazir in fact seems to have to a large extent surrendered his right over the property of the members of his tribe to the Government.

The uncultivated land of the tribe became the property of the Nazir in the following way:— When the tribe came into possession of certain lands whether by conquest, gift or any other way the Nazir and the *Agawid*, or elders of the tribe, would divide the land among the members of the tribe according to their ability to cultivate, the Nazir and *Agawid* also taking their own personal property at the same time; the remainder of the undivided and uncultivated land became the property of the Nazir for the time being and he could make what arrangements he liked with regard to the cultivation of it, whethers by strangers or members of the tribe. But he could not sell it unless he proved to the satisfaction of the *Agawid* that he was in necessitous circumstances; if he proved this the members of the tribe had first call on the land and if none of them wanted it he could then sell it to the strangers and keep the price for himself. Similarly no member of the tribe might sell his land to a fellow tribesman or to a stranger, unless he proved that he was in necessitous circumstances.

In the case of Adam Ismail the *Nusara* of the Dueih has always remained in the same family, descending from father to son, and the rights had accordingly descended from the *Nusara* and for this reason Adam Ismail has *Wasikas* confirming him personally and by name in the right exercised by his fathers and grand-fathers. But the Nazir's rights are in fact neither divisible nor heritable and should it happen that the *Nusara* were transferred from him or his family to another family, the rights would be transferred with it, while Adam Ismail or his descendants would only retain the personal property which was allotted to his ancestors at the time of the tribal division of the land when the tribe first came into possession of their land. In spite of the fact therefore that many Nazirs have *Wasikas* conferring on them personally and by name rights over property, these rights are only theirs in virtue of their position as Nazir, and are not divisible nor heritable, but are attached to the *Nusara* whether it remains in the same family or is transferred to another.

SECRET SOCIETIES OF THE SOUTHERN SUDAN.

The following is a resumé of information about Secret Societies among the tribes of the pagan South in Sudan Territory with which we have been favoured by correspondents. For various reasons it is impossible in every case to indicate the source from which this information has been obtained, but there is no doubt of its authoritative nature. Although none of the societies mentioned appears to be of very recent origin, it seems that their baneful influence has been increasing during the last few years and the Government has found it advisable to pass special legislation for the suppression of their 'dangerous and obscene' rites. (The Unlawful Societies Ordinance 1919; Sudan Government Gazette No. 351. 15 November 1919.) The societies dealt with in our notes differ in name, origin and geographical distribution, and there appears to be no evidence of any connection between the several organisations. At the same time we cannot fail to notice striking similarities in their objects and methods in so far as they are known; but more information is still required to throw light on the religious and magical aspects of these cults. Most observers who approach the subject from the administrative point of view, emphasise their evil influence as media of terrorism, debauch and robbery, and it is suggested that they are mainly the work of unscrupulous individuals who exploit the fears of primitive man for their own nefarious ends. But the analogous phenomena in other primitive communities as well as the use of 'fetish' or magical objects in their rites suggest that there is a religious side to the practices of these societies which deserves to be more closely studied. It would be interesting to know, for instance, whether these cults are regarded as supplementary or antagonistic to the traditional rites and beliefs of the uninitiated members of the community, and whether their influence depends on the transitory prestige of some particular person or is deeply rooted in the 'official' religion of the tribe.

I. BIR (BILI)

cp. S. N. R. vol. 11. p. 27.

YAMBIO DISTRICT: Deserters are believed to be harboured by the professional magicians who set up their establishments in the densest and least accessible parts of the forest. These impostors give out that the betrayal of any fellow member frequenting these establishments leads to the inevitable and instant death of the informer by magic agencies; consequently they become the resort of criminals of all kinds and their arrest is difficult. (December 1915)

A few months later the Acting District Commissioner reports that the evil influence of the magicians is on the increase and that he has received complaints from the chiefs whose authority the witch-doctors undermine, as also from the Mission. The members of a secret society called Bili consider themselves superior to the rest of the Azande who do not know their rites. They aim at the destruction of persons who have wronged or offended them, the extortion of women and goods, the defiance of all authority and independence for themselves as superior beings. Many deaths have been ascribed to Bili and without doubt some of them with reason. The Rev. W. Hadow C. M. S. states that the Azande themselves have told him that they recognise Bili as an evil and assign it the first place in the category of evil; people live in mortal dread of death, or at least dare not refuse any demand the magicians may make of them.

MERIDI DISTRICT. Reports dated January 1916 to July 1918, state that the Zande portion of the district is overrun by votaries of the cult of Bir which is undoubtedly the same as Bili described as being prevalent at Yambio. A Bir house was surprised by night and several arrests were made. Hashish galore was found amongst other things on the premises. The practices and initiation ceremonies of this cult, as described by the Inspector, are too infamous to bear repetition.

The fear of death at their hands is not unfounded. A corporal of Police who was rewarded for his zeal in finding out concealed Bir houses, only just discovered in time on the following day that the mouthpiece of his pipe had been stuffed with virulent and deadly poison.

Sultan Yango, one of the most powerful chiefs of Meridi district, found that during his absence in Khartoum four of his wives had been enticed away by Bir parties, but was frightened to pursue the matter as he had been threatened with death, should he attempt to interfere. The District Commissioner was able to obtain a guide to the secret meeting place. The Bir party had posted a sentry along the cleared path who challenged in the ordinary military way, but the guide gave some secret pass word which enabled the party to approach the sentry and seize him. Unfortunately the noise alarmed the rest of the party and only three were caught. The others had escaped at the first alarm taking Yango's four wives with them and probably found refuge in the Belgian Congo. At the Bir rendez-vous there was a cleared space and rakûba and a good quantity of hashish and special Bir wood was found, also a basket rattle containing seeds and shells. This rattle is a Monbittu production and a picture of one may be seen in the full page illustration of Manza, a Monbittu chief, in Schweinfurth's book. It is quite foreign to the Azande, though the Bandas wear a somewhat similar rattle tied below the knee during the performance of certain of their dances.

TEMBURA DISTRICT. The District Commissioner reported in July 1917 that there were very few Bir or Biri devotees in this district or in the adjoining country of chief Toin. He mentions however that it is now the fashion amongst the natives to label any deaths which their oracles declare are due to spells, (and which they formerly accepted as such) as being caused not by these spells but by Bir. This they do in the hope that the Inspector will be beguiled into taking action against the persons whom the oracles have declared to be responsible for the various deaths.

The Governor of Bahr el Ghazal Province writing in August 1918 makes the following remarks about Bir: 'There is no doubt that this disgusting 'Society' is gaining in numbers and it is my belief that wherever the NyamNyam are gathered together there will votaries of the cult be found. . . . Besides being ultra-bestial in its rites Bir undermines the foundation of local society, for one of its tenets is that a woman who has been initiated cannot ever sleep—have intercourse—with her husband again, under pain of death both to herself and the husband. Unmarried girls, whom I am sorry to say the Society also numbers amongst its members, must not marry

outside the Society. In effect the women and girls are shared by the male members, a proceeding which must tend greatly to spread venereal disease. That the people are in fear of the Birites there is no doubt, and it is a significant fact that two men have died in Wau hospital within the last few days of poison.

BELGIAN CONGO : Here also the Bili (or Nbili) Society is rampant; it is stated to have originated among the Monbittu and to have been spread by them among the Azande. Members upon being initiated receive new names, like Gilinga, Gaduma, Zombo, Missa, Mando etc. for men, and Nebili, Matala, Manzekke, Bumandu and Torogo for women. The chief of the cult is supposed to be able to cause and cure diseases, to ensure good crops or cause them to be destroyed by elephants and to kill people by means of lightning etc. The magic is worked by means of a small wooden whistle called filili : in order to injure a person it is sufficient to speak the name of the intended victim and blow a blast on filili. The power of using this instrument of destruction is not confined to the chief, but shared to a certain extent by other initiates. New members are often recruited by force or intimidation. When a woman has been seized by the votaries of Bili, her parents or brothers are called upon to pay her ransom and in many cases they themselves join the Society through fear. New initiates are required to remain several weeks or even months at the headquarters of the chief and to work in his cultivation. Members show great hospitality to one another, and the secret of their rites is very carefully guarded. The hut or shed in which the headquarters of Bili are situated, has six doors, one of which is used by the new members, while others are reserved for patients who have been made ill by filili and apply to be cured by the same agency; a door to the right is reserved for the chief and one to the right of that for the chief's principal assistant who is always a woman. In the middle of the building a fire is kept continually burning, the ashes from which are carefully preserved near by. Around this main building are grouped a number of huts each surrounded by a zariba.

II. MANI.

A society called Mani (also spelled Maney) is reported from Yei River district, Tembura in the Bahr el Ghazal, and the Belgian Congo. Accounts are somewhat conflicting : the Yei report states

that it originated in the Belgian Congo amongst the Azande and that in the district mentioned it is practically confined to the Makraka tribe who of course are closely affiliated to the Azande. The Belgian authority on the other hand states that the greater part of the members are young Avungera girls, the object of the society being debauchery. According to this observer the members use a small blue bead which seems to be imported from the Sudan as a distinctive badge, and they do not inspire the superstitious fear which is such a characteristic feature of Bili. The District Commissioner of Yei is of opinion that it has nothing whatever to do with Bili, and that it was brought to Yei about two years ago by an individual called Fa Ray who initiated several persons. The initiation consists in the individual receiving some of the Mani medicine for which he pays two or more spears. The benefit derived from eating this medicine is as follows: if an individual A has an enemy B who kills A through the agency of a spirit (Lukunda) then if A is a Mani, B will also die of a spirit. Mani therefore does not ensure protection, but by threatening certain vengeance acts as a deterrent.

The Mani people hold special dances which are not unlike the ordinary Makraka dances and are sometimes performed naked. At these dances further payments are made to the head of the society present. Initiates are given special names which are not used in ordinary conversation, and members on meeting use a special form of salutation.

NOTES.

FUNG PROVINCE.

SOME NOTES ON BURUN CUSTOMS AND BELIEFS.

By Capt. J. P. MOSTYN.

The following notes are based on information obtained from time to time during my journeys (1915) amongst the Buruns. They are very possibly inaccurate. It is very difficult to get these wild people to talk. I do not think, however, that much, if any, information about their customs and beliefs has ever been sent in, so possibly that contained in these notes may be of some use.

Buruns on J. Maiak and its vicinity.

The sun is the big god but each Jebel is believed to have a god of its own who lives in the rocks. Bad years and such like are thought to be a sign that the god is angry with the inhabitants of the Jebel. I was unable to find out how he can be propitiated. Possibly they have to wait till his anger calms down.

These people have witch doctors; if any one is sick the witch doctor comes and sucks some part of the invalid's person and thus sucks out the disease.

They take omens by lighting a fire and observing how the flame burns or the direction in which the wind blows it, and according as this happens the omen is good or bad. I was unable to discover further details about this.

Buruns on the Khor Yabus.

The rain and the sun are considered "gods". The sun being the bigger god of the two as he appears daily whilst the rain only comes in the rainy season. The rain god is called doam. Only big chiefs (and very few attain this honour) are thought to have an after life. I do not think any chief within living memory has been great

enough for this. It seems that the first chief of the Buruns who originally made the tribe became a spirit and now looks after them and guards them. My informants were very averse to discussing him—possibly because they feared his anger.

The ordinary man and woman have no after life whatever, death to them is the end of all things.

A dead person is buried under the floor of his hut: if he has relations still living they keep the hut in repair till the village moves, otherwise it is allowed to fall down. Each man is buried with his spears, bow and arrows, iron rings, beads etc.—in fact apparently with most of his possessions. Women are buried with their bracelets only. Both sexes are buried with their clothes on if they are fortunate enough to possess any.

Deceased persons are mourned for six days. The mourners then have a feast and shave their bodies. No food, water or anything of that sort is given to the dead as is the custom with some tribes. Presumably as they do not believe in after life it would be useless.

Four wives is the most they ever have. When a man wants to marry a girl he collects as many spears, beads, fasses, bracelets and pigs as he can and takes them as an offering to the girl's father. If he is approved of as a prospective son-in-law he then has to bring as much Marisa as possible.

The would-be bridegroom then has to wait for an opportunity of kidnapping the girl and carrying her off to his village. When this has been successfully accomplished both villages meet and make merry, leaving the newly matched pair to themselves.

Murder is avenged when a relation of the murderer has been killed by the murdered man's relations, but the murderer himself should be killed if possible.

Theft is, I think, practically unknown, but raids frequently occur when the flocks and herds of the raided village can be legitimately carried off; such raids are avenged by counter-raids.

In adultery cases the man is killed by the outraged husband. The woman is not punished, all the blame seems to attach to the man.

I do not think adultery is common. It seemed to be looked upon with considerable horror. Being a naked tribe the Burun are very moral.

Feuds between villages go on for years causing practically perpetual Vendetta—the mere fact of avenging one murder creates a necessity on the other side of avenging the last act of revenge perpetrated on them. Some times the enemy village is raided but more usually I think the village whose turn it is to murder, details one or two men to lie in wait till a solitary unsuspecting enemy approaches.

When investigating a murder case I have usually found every body knows what village the murderer came from, though the identity of the actual murderer or murderers is not known. A year or two may elapse without any attack being made on either side but the feud is sure to break out again sooner or late. The Buruns hunt a good deal, their weapons being a bow with poisoned arrows and they will follow a wounded animal for days.

Grown up men seem to live chiefly on Marisa and a tremendous lot is drunk. They all eat meat when they can get it, some of the older men, I am sure, live almost entirely on marisa.

Several boys and young men appear fairly intelligent as are also the young girls, but the young girls become old hags at an early age, and the young men soon lose their intelligence. As a whole I consider the Burun about the lowest type of man I have met.

The Fung Drum or Nehas.

Mek Nasr, the lineal descendent of Mek Badi the Fung Sultan who surrendered to Ismail Pasha on June 11th 1821, possesses a nehas or copper drum which might possibly be the one alluded to by Bruce (Travels etc. Vol. 2 page 297).

Tradition states that this drum is the original Fung drum and the gold was removed in times of stress by the persons into whose hands it passed.

This drum has been examined and it is engraved with an inscription as follows:—

تقارة الدار تقارة السلطان
 عمارة بن السلطان عدلان
 جدم الكبير الجساء
 من لول عمرها السلطان
 بادي بن السلطان
 نول نصره الله
 آمين

Translation:—

The drum el Dar (of the country)

The drum of the Sultan Amara ben Sultan Adlan their
 grandfather who came from Lul

Made by Sultan Badi ben Sultan Nul whom God grant victory.
 Amen.

It would appear probable that by Amara ben Adlan is meant Amara Dunkas, who was the son of an Adlan and the founder of the Fung dynasty in 1504 A. D. A. E. R.

Editorial Note.

The possession of a Nehas is generally considered to constitute a definite sign of the tribal ruler, and we should be very glad to receive any further information, especially copies of the inscriptions or histories of these drums.

MONGALLA PROVINCE.**Ornaments and arms among the Acholi
and their neighbours.**

The following notes have been extracted from a Report by Major J. Powell R. A. M. C. in June 1913. Apart from a few verbal transpositions the notes are printed here as they were originally written. Any who are interested in the subject may find a few objects similar to these described, in the Ethnological Museum in the Gordon College Primary School.

ACHOLI.**MEN.**

Very Warlike in dress.

Head Ornaments.

Wart Hog tusk, marked with black burnings in dots, attached to the head by string of split cowrie shells which look like teeth. The tusk rests on tuft of hairs to which it is stitched or pinned. Conical building of hair generally surmounted by top of cartridge case and bound on to head same as tusk. Feathers are stuck all over this ornament.

Bead helmets.

Hair Helmets like Tam o'Shanter's.

Dish shaped hair helmets.

Lip is pierced with long curved piece of greenish glass.

Neck Ornaments.

Beads.

Steel wire rings.

Goat or small gazelle horn ornaments with steel and leather binding; or used as a musical instrument, which is worn when charging.

Arm Ornaments.

Wrist knives about 5 inches in diameter, steel wires above elbows, often very tight or numerous, causing marked distention above, and pain.

The first ring is supposed to be put on by a village virgin, who has to flee for her life and make a great noise before being caught, but when caught adjusts the ring.

Ivory ring on arms and fingers, skins of leopard, black, white and brown monkey worn over shoulders. Large tails of giraffe, hartebeest cows, with leather attachments covered with cowries, small tortoise shells, with small chains or belts attached to arms by leather bands.

Clay painting in blue, yellow, white, red and grey. This painting is well done and symmetrical, many men being done exactly the same. It is not washed but allowed to wear off.

Ankle Bands.

Ankle bands of feathers, pieces of hair and ivory. During a large dance specially noted, one native wore long streamers of white tufts like wood fibre attached to shoulders, elbows and hips.

Another native wore grass, pieces of doleib palm and appeared to be accepted as a clown.

Weapons.

Large spears feathered on shaft.

Short stabbing spears.

Large black shield profusely ornamented with steel and brass binding and with large pom-pom tied on to foot end.

WOMEN.

Married, wear blanket or skin kilt.

Virgins, naked except small fringe of steel chains, one or more, three inches to four inches in width and 24 inches to 30 inches in length. Necklaces of beads. Heads may be shaved or hair worked into different modes with mud, the most popular colour being brick red.

Chief Lomui.

I saw a large dance at the village of Chief Lomui. It was very well arranged and consisted of many distinct figures. All women young and old took a prominent part. Customary when a man is pleased with a girl to raise both her arms above her head, she dances in that position for a few minutes and then lets them drop to her side.

DIDOAN INHABITANTS OF MORONGULI LOKUTA'S.

MEN.

Head Dress.

A pad of hair is worked up and attached to head, may hang down to below shoulder blades one inch thick and 14 to 16 inches

broad. This is studded with small feathers almost like a full judge's wig behind. The weight appears to cause premature baldness underneath. Bent over the head from behind forward, a main rib or two main ribs of some large feather, bound round with fine thread and finished off with small black pom-pom identical with ornament worn by pantomime clown.

Ears pierced for large brass circular plates and brass rings.

Neck Ornaments.

Steel rings to such an extent that rotary movement is suppressed and breathing and swallowing made difficult.

Lip pierced as for Acholi.

Weapons.

Carry very small white hide shields.

Carry small light spears.

Wear curved hooks on thumb, supposed to be for close quarters fighting.

DIBOSANS.

Head Dress.

Hair helmet covered with white beads.

Hair helmet with two circular collections of small red beads just above ears.

Hair helmet dish shaped.

Helmets made of black ostrich feathers, rather like Highlanders.

Feathers stuck into small cones made of hair and mud on the head.

Other Ornaments.

A broad band of numerous small red beads crossing forehead and divided over nose by a 1 inch broad collection of small white beads, very distinctive.

A steel and brass band worn around neck and arms.

Practically the only beads worn by men are the small red and a large opal coloured and circular bead the size of a large marble.

A small tight band of hide is worn across belly and over top of hips.

Weapons.

Very long, heavy, broad, shafted spears; the hilt is made of

very well seasoned wood, and each spear is ended off in a very long sharp point.

May be tufted near head. If in peace, edge guarded by small leather edging finished at pointed end by small black hair tuft.

Broad bladed short stabbing spear; the shaft beautifully bound with fine hide like strong cord and finished off into a knob.

Wrist Knives.

12 to 14 inches in diameter, guarded at wrist and edge with circular band of leather finished off with brass.

All men carry small polished stools. When a man is standing it is always held between the legs with seat portion to the front. Shields of large white hide, big black pom poms at end.

Large tails are worn at the elbow.

WOMEN.

Wear numerous skins, and immense quantities of different beads, brass and iron wire.

LOGHIRI HILLS.

People from Loghiri Hills have an exceptional brass helmet made in sections of beaten brass held together by hair and grease surmounted by a plume almost 16 inches high. This plume is composed of separate circles of cord, with tufts of red feathers. Each circle of cord with its tufts of feathers is threaded into central stick, and decreasing in circumference, is brought to a point with a tuft of black feathers.

The red feathers are obtained during the dura season from the breast feathers of a small dura-bird, greatly prized and difficult to obtain.

Skin Marks General.

Patterns on chest, belly and face, generally some circular knife cuts worked into scars.

On shoulders among the Dibosans, marks denote persons killed; women are included, and I understand to kill a woman is better than to kill a man.

SCIENTIFIC RESEARCH COMMITTEE.

1. Soil Investigations in the Sudan.

By A. F. JOSEPH.

The scientific examination of soils of this country has been carried out at the Wellcome Tropical Research Laboratories for about 15 years beginning with investigations by the late Dr. William Beam on methods of analysis suited to the peculiar heavy clay soils of the Gezira. It is, perhaps, hardly necessary nowadays to emphasise the importance of soil study in countries which are apparently bound to depend for their means of support on agriculture: it is sufficient to point to the energetic prosecution of soil research in Europe, America and the colonies, and to the successful development of those territories where such work receives adequate attention and support.

The soil problems of this country present many features of special interest to the research worker on account both of the new questions continually arising and of the entirely different behaviour of the same kind of soils in this and other countries.

Dr. Beam published nothing on soil questions after 1914 and it was only at the end of 1919 that the subject was resumed. Several different lines of investigation are now in progress and the present note deals with certain properties of the clay soils of the Gezira. These "badobe" soils—i. e. those which crack a great deal on drying—are of the same type (but not necessarily of the same origin) as those which occur in other countries where high temperatures and low humidity are characteristic of the climate. They have been found in India, Egypt, and the South Western States of America and are distinguished by containing a proportion of clay which under a cooler and more humid climate would prove utterly unmanageable. This high clay content confers properties on the soil of great importance to the agriculturist. Such soil has to a high degree the power of absorbing and holding water, and it also clings tenaciously to the mineral constituents (salts) soluble in water which are so necessary for plant

nourishment. So prone is it to do this that the soil easily becomes loaded with an excess of salts, which whilst being beneficial when present in moderate quantity, are detrimental to plant growth when the proportion exceeds a certain limit. From a study of samples collected during the last two years, we have found that the salts increase in land which has been irrigated for a number of years and also, comparing parts of the same estate, plots which give on the average poor yields of crop, contain more salts than plots which give good yields. In the case of the Gezira, salts derived from the Blue Nile irrigation water are of course being continually added to the soil and much patient investigation is still needed to determine the effect of prolonged irrigation with this water on the fertility of the soil.

Another point which has come to light during the studies on soil "alkali" (the name given to soluble salts of the soil such as common salt and similar substances) is the regular occurrence in irrigated land of a depth zone of maximum salt concentration. At the Gezira Research Farm and at Shambat, Khartoum North, the salt content increases with the depth until the sixth foot is reached, after which it steadily diminishes to the 18th. foot which is greatest depth to which samples have at present been taken.

It is a curious fact, and one which may come to be correlated with this phenomenon of maximum salt content, that the proportion of clay in the soil shows the same tendency to increase with depth down to six feet and then get somewhat less again. This is seen quite clearly for moderate depths if the results of a large number of analyses are averaged: thus the average clay content for the whole of the Gezira Research Farm first foot samples was 55.9 and the fourth foot 58.8.

This note has dealt only with a few points which have come to light during the past two years study of the Gezira soils, but a number of other investigations are in progress and it is hoped to refer to them in future communications to this journal. One point may be emphasized: the material for these researches is obtained from all over the Sudan through the valuable cooperation of the Inspectors of the Agricultural Department and others. The writer would always be most grateful to anyone (especially in districts which are not visited by an Agricultural Inspector) who would assist the work by taking soil samples: details as to the manner of taking the samples and bags to contain them would be furnished to those willing to help in this way.

2. Notes on some Plant Diseases caused by Fungi in the Sudan.

BY R. E. MASSEY.

With the single exception of a brief account in the Third Report of the Wellcome Tropical Research Laboratories 1908 pp. 245-47, no reference exists in literature to the diseases of plants caused by fungi in the Anglo-Egyptian Sudan.

It seemed advisable therefore to record in a concise and nontechnical manner a few facts concerning the most important of these pests; in the hope that further information might be gathered from officials in the country regarding the distribution, virulence, and occurrence on host plants other than those mentioned below.

Dura :— Considerable loss is caused yearly by Smut (*Sphacelotheca Sorghi* (Lk) Clinton) in which the grain is replaced by a sac containing a mass of minute black spores. The infection is carried by the seed, and can be prevented by the simple immersion of the grain before sowing in a 2% solution of Copper Sulphate (Blue Vitriol) for ten minutes. This method is extensively used by cultivators in India, and might easily be introduced into the Sudan.

A wooden vessel should be used for preparing the solution (1 lb. of Copper Sulphate in 5 gallons of water). The seed is simply placed in the solution, stirred round for ten minutes, then spread out to dry in thin layers on mats, and finally is sown within twenty four hours of treatment. The last is important as if the seed is kept longer before sowing germination may be affected.

Other smuts occur which are not so tractable, notably Head Smut (*Ustilago Reiliana* Kuehn) of Dura, Durra Shami (i.e. Maize) and their wild relative Addar (*Andropogon halepensis*, Brot.). In this disease the inflorescence is much distorted and converted into a mass of Smut. The main infection comes from the soil, and disinfection of the seed is useless, the only possible means of mitigating the effects of the disease being to remove infected plants at once and burn them.

The common Rust of Durra (*Puccinia purpurea* Cke.) also occurs in the Sudan, and may be recognised by the dark purplish raised ridges and spots on the leaves. The disease is usually of small significance and merits no special note except that again the wild

Addar is a secondary host, and being perennial, no doubt favours the persistence of the disease.

A curious rust of which more details are required was found at Tokar, this species appears to be new, and has yet to be fully described. It differs from the above in that the rust spots are dull, reddish brown, velvety, and oval in shape, rather than definite ridges.

Wheat :— The most formidable enemy of the cultivator is Black Rust (*Puccinia graminis*, Pers) at present the only species found in the Sudan.

This disease appears at an early stage in the formation of the grain, consequently infected plants yield either shrivelled berries or, in extreme cases, no grain at all.

It is favoured by several conditions e. g. high nitrogen content of the soil, excess of water, unusual humidity of the atmosphere, and by the inherent susceptibility of the individual plant.

The indigenous wheat of the country is notably susceptible to attack by this parasite, but fortunately wheats have been found which are more resistant and which can be grown with success in regions especially liable to this disease.

It is worthy of remark that, as in several other tropical countries, no secondary host has yet been found, and that exact means by which the infection is carried over from one season to another has still to be discovered.

Smut of wheat is rare, and the only other fungoid disease which merits attention is a curious foot-rot found by the writer in Berber and Khartoum in 1919.

Wheat attacked by this disease is easily recognised by its dark yellow brown colour and shrivelled appearance, and by the fact that when grasped the plants break off short at the base which is completely rotted through.

The causal organism is a species of *Helminthosporium*, which at present seems to have not been described or named.

Similar foot-rots have been reported from other countries, but no description has been given of the parasite.

The Sudan species is under investigation at the Imperial Bureau of Mycology.

discoloured. Mycelium is usually found but no fructifications have ever yet been seen.

"The characters of the hyphae suggest *Rhizoctonia* (a common parasite in Egypt), but their distribution through the tissue is unusual for this fungus, and their quantity hardly enough to account for the cortical destruction". (*Extract from a letter written by Dr. E. J. Butler C. I. E. to the writer*).

The disease bears considerable resemblance to the root-rot, described by Butler in India (*Fungi and Disease in Plants* p. 370) in the form on mature plants, which was first thought by him to be due to *Rhizoctonia*. This view was however abandoned when affected plants were eventually found on which there was no trace of the fungus. It is possible that the disease is of a non-parasitic nature and of the "Phloemnecrosis" type; localised soil conditions are probably the primary cause of the trouble.

Loubia-Afin :— (*Dolichos Lablab* Linn) is probably one of the hardiest of all cultivated plants, but it is not entirely immune to disease, large areas were destroyed in Berber a few years ago by the combined attack of an insect and a fungus⁽¹⁾ (*Cladosporium Fumago* Lk.).

The fungus is not a parasite and does not feed on the plant itself but on the sugary substance excreted by a species of white fly.

The name of Sooty Mould usually applied to this type of disease is an apt one for the surface of the leaf is covered with a thick black felted mass of mycelium which blocks the stomata and chokes the plant.

Spraying with soap solution and tobacco extract was found to be an efficient remedy at Khartoum but this would be difficult, if not impossible on a large scale.

Melons, etc. :— The next disease of importance to be mentioned is the Powdery Mildew (*Erysiphe Cichoracearum* D.C.) of Cucurbits i.e. Melons, Pumpkins, Gourds, Cucumbers etc., It is characterised by a

⁽¹⁾ This is the *Cladosporium* stage of *Fumagovagans* Pers, which again is the conidial form of *Capnodium*. *Alternaria* and *Macrosporium* spores were also present.

floury coating on the leaves, mainly on the upper surface: leaves so affected dry and shrivel with the result that if the attack is at all severe the plant dies, even a slight attack will reduce the quantity and quality of the fruit.

The treatment of this disease is so simple and yet effective that it ought to be made known throughout the country.

It has been found elsewhere, and by the writer in this country, that a single application of Flowers of Sulphur, contained in a bag of damour and dusted over the leaves is sufficient to check the disease whilst a second usually effects a cure.

The same fungus attacks other cultivated plants, amongst which may be mentioned Bamea (*Hibiscus esculentus* L.) and Tobacco, it is also to be found on numerous wild plants which undoubtedly serve as host plants.

Potatoes:—Some years ago at Shambat considerable damage was done to young seedling Potato plants by a fungus known as *Rhizoctonia Solani*, Kuhn. the affected plants withered from the top, and the stem about ground level was blackened and rotted. The disease spread to a patch of *Fasulia* (*Vigna Catjang*, Endl.) near by, and even attacked young plants of *Loubia* Afm. Sections made across the basal portion of the stem revealed typical small black sclerotia (i.e. compact masses of mycelium) in the outer layers of the tissue. The disease was most probably introduced with the seed, and since this date all potatoes sown at the Botanical Laboratory have been disinfected by washing in a solution (1—2000) of Corrosive Sublimate.

How necessary this precaution is will be realised when it is known that this fungus is almost omnivorous in nature and attacks practically all farm crops, notably young cotton, on which the disease is known as *Soreshin* in Egypt and is of considerable importance.

Peas, Beans etc:—There is a type of this disease to which the term *Wilt* is generally applied, the symptoms of which exactly resembles the effects of drought. The green portions wither and dry up while the roots and the base of the stem are blackened, also the internal tissues are found to be discoloured in streaks, particularly along the vessels conducting water from the roots to the aerial portions of the plant.

The cause has been traced to fungi of the genus *Fusarium* which

normally inhabit the soil and which are capable of developing into parasites under favourable conditions. It appears that the hyphae penetrate the fine lateral roots and spread through the large conducting vessels of the wood, literally choking the plant by impeding the water supply.

The fungus has been recognised on Cowpeas, Garden Peas, Beans, and on Senna grown under cultivation with an excess of water.

It is most probable that in the Sudan the fungus only attacks plants which are already ailing, and that remedy lies in good cultivation. In other countries where the disease is more common remarkable success has been attained by the breeding of resistant varieties by selection and hybridisation.

In conclusion, the Government Botanist will welcome inquiries and specimens from all parts of the Sudan, and will be glad to indicate the remedy whenever possible.

Notice of Publications.

The following scientific papers have appeared since the last list was published in the issue of July, 1921 :—

1. "The Determination of Clay in Heavy Soils," *Journal of Agricultural Science*, July 1921. A. F. Joseph and F. J. Martin.
2. "The Briquetting of Charcoal," *Journal of the Society of Chemical Industry*, August 31, 1921. A. F. Joseph and B. W. Whitfield.



CORRESPONDENCE.

Weights and Measures.

In the course of enquiries into the weights and measures of the Sudan, especially in comparison with the standard weights and measures of Egypt, some interesting peculiarities have been disclosed.

Egyptian weights and measures, which, by the Proclamation dated 31st July, 1899, are the standard weights and measures of the Sudan, are largely accepted and used in the northern parts of the country. These weights and measures, in their relation to standards of the West and Near East may be traced to the influence of the successive conquests of Egypt; but so far as I have yet been able to discover, several weights and measures used in the Sudan bear no direct relation to any known standard.

Perhaps the subject may interest some readers of Notes and Records who, having studied the habits and history of tribes further removed from the influence of the Northern civilisation, may be able to throw light on the origin of some of the weights and measures peculiar to this country.

Probably the best known of these is the *Gedaa*, used in the Gezira for measuring rain grown crops. A square *Gedaa* is 4,096 square *Oods* of 16 square *Diraas*, or approximately $5\frac{1}{2}$ feddans. One rather sketchy account of its origin is that in the days of the ancient Sultans of Fung, when land was to be allotted, the favoured applicant was allowed to gallop a marked distance and throw a stick. The distance of the gallop plus the throw was a *Gedaa*, but the extent of the marked distance is not known. A similar account of this method of allotting land comes from the Red Sea, so that there may be something in this fable.

Another theory giving a variation of the above, comes from the Blue Nile Province where the word *Gedaa* is held to have come to its present use from the use of the phrase "*Gedaat-El-Hagar*" a "stone's throw", meaning that the length of the land is equal to the distance covered by the throw of a stone.

Nothing appears to be known of the origin of the *Mukhammas*, a measure used, principally in Kordofan for measuring crops. It is

most probably a measure which has grown from the expression of a day's work on the land, possibly in sowing, as the feddan originally was the extent of a day's ploughing.

Further interesting peculiarities appear among the weights used for precious metals and stones. The Egyptian basis for these weights is the Arabic gold *Mithgal*, introduced at the time of the Arab conquest of Egypt. This weight is equivalent to $1/72$ of the Egypto-Roman libra. The *Kirat* which appears in most of the Sudanese tables of weights and measures, is $1/24$ th of any accepted basis, and has become the unit of weight for precious metals throughout Europe, where it is commonly known as the *Carat* in expressing assay. The Egyptian *Kirat*, $1/24$ th of a *Mithgal*, very closely relates to the ancient and modern *Kirats* or *Carats* of European countries, but the Sudanese *Kirat* is ten times that of the Egyptian and, moreover, is used as $1/16$ th of a standard basis and not $1/24$ th.

The common Sudanese standard basis for precious metals is not the *Mithgal* but the weight of four English sovereigns, and is called an *Ogia*. The mint weight of a sovereign is 7.98804 grammes, giving the Sudanese *Ogia* of 31.95220 grammes. One-sixteenth of this is the Sudan *Kirat* and is approximately equal to 2 grammes.

The English sovereign is as good a standard basis as the Arabic gold *Mithgal* or any other standard, but it is a mystery why the Sudanese take four sovereigns as a standard basis and why also their *Kirat*, even on this basis, is one-sixteenth and not one-twenty fourth of the standard.

H. P. HEWINS.

The Gash Dam.

The following particulars of an old dam on the Gash may be of interest to readers and can be found on pages 213—216 of "African Wanderings" published in London in 1852.

The period of the construction of this dam was between July and September 1840.

The idea of a dam so as to cause the surrender of the Arabs to the invading Turks is credited to Mohamed Ehle of the Halenga, who was then a spy with Ahmed Pasha Abu Uddan's army.

The Halenga tribe furnished the baskets and mats whilst the soldiers and every one else obtainable worked on the earthworks so as to prevent the flood water descending to the Hadendoas and

thus deprive them and their herds of the annual replenishments for the exhausted wells.

The khor was 1220 metres broad and the slope of the dam which was 1613 metres long was 45 degrees. The dam was 5 metres broad on the top and the earth was stayed by tree trunks erected in the bed of the khor before the bank was made. These tree trunks were sunk into the khor bed and laced or anchored as far as possible.

The dam was situated half an hour from the suk of Huathi. From a subsequent account we learn that the guards on the earthwork, which was then holding up a head of ten feet of water, were massacred by the Arabs. The earthwork was cut and the escaping water entirely destroyed the dam and removed all traces of its construction.

A. E. R.

Dreams.

I notice in "Sudan Notes and Records" that you would like notes on dreams among native people. The following may be of interest.

My informant was a Nuba youth, born at Koalib and brought up in the Heiban Mountains. He is a recruit in the Army and is a particularly intelligent youth from whom we receive a good deal of information about the Nuba language and customs.

He told me he dreamed about money, *Gurush ketir*, about relations with women, about owning large flocks and herds, and that sometimes he was afraid of being knifed.

The following dream he said he had dreamed on the previous night. That he saw Kabushe's⁽¹⁾ people carrying a dead man to the burial place. They dug a hole in the ground but found he was too long to fit into the hole so they broke his legs and doubled them so that they could bury him. Then they buried him in the ordinary way. He said he had never seen people break a dead man's legs in order to bury him, except in this dream.

This dream was on the night after a shooting affair took place between Kabushe's people and another local clan. One man on each side was killed.

D. N. MACDIARMID.

⁽¹⁾ *Head man of a village on Heiban.*

Dreams.

In response to Dr. Seligman's request for notes upon dreams I venture to put on record a dream told me about two years ago by a *sais*, although as the *sais* is no longer in Khartoum I have been unable to make the record as complete as I should have liked.

The *sais* in question, a Berberi from Kalabsha, was unhappily married and was firmly convinced that his hated wife had written, or caused to be written, a charm which was ruining his happiness and enjoyment of life.

One day when he was looking less morose than usual he surprised me by asking leave to go to visit a certain sheikh: I was surprised because the sheikh whom he wished to visit was not the sheikh of his *tariqa*, and I asked him why he wanted to go.

He replied that it was because he had a dream the night before. He said he had gone to sleep as usual feeling very melancholy, with the knowledge that all men were whispering against him and that he had enemies all around. In his sleep he dreamed that he was in a great open place in one part of which he saw the sheikh of his *tariqa* standing surrounded by his followers: in other parts were other sheikhs surrounded by their followers. He naturally went towards his own sheikh to get the usual blessing, but when he approached him the sheikh raised his head and pointed to a rival sheikh, evidently directing him thither. He accordingly went to the rival sheikh and when he had come before him, the sheikh stretched out his hand with all his fingers extended and hit the *sais* in the middle of the back, drawing out of his back a small black puppy and a small black kitten, both of the female sex. The sheikh flung the two animals on the ground and they lay there wriggling like two little snakes.

The *sais* then woke up, feeling wonderfully refreshed, at peace with all the world.

He had already, before speaking to me, been into the town to a petition writer and had dictated his dream to the scribe; armed with this and, I presume, a suitable present he visited the sheikh on the day following, and for about a week he was perfectly happy.

The sheikh, whom I questioned about it myself, told me that he realised from the dream that the man's unhappiness was due to his

wife and determined to have nothing to do with the case; whether he argued this from the colour and sex of the animals in the dream or from independent enquiries I do not know. Anyhow at the end of a week the effect of the dream wore off and the last state of the sais was worse than the first.

J. W. C.

**The Sudan Kite, *Milvus migrans parasitus*. Daud.
feeding on the caterpillars of the Silver-striped Hawk Moth.
Phryxus (Deilephila) livornica. Esp.**

On September 15th, 1921, my attention was drawn to large numbers of kites feeding on the caterpillars of the Silver-striped Hawk Moth on desert land immediately behind the Gordon College Primary School. Mr. J. Hirst, who made the observation, said the kites had been gorging themselves with these caterpillars for two days.

During the rainy season in Khartoum, there are at least two broods and often three of *P. livornica* according to the period of rain and the subsequent growth of the food plant *Limeum viscosum*, Feng, Arabic name "Tarba". Towards the end of the second brood, when the leaves of the food plant are almost stripped clean by the caterpillars, the latter are to be seen crawling about the ground in search of fresh food and it must have been at this stage that the caterpillars were observed by the kites near the Gordon College, for although I passed over the place daily during the first rain brood, and frequently saw kites flying overhead, the birds were not observed to attack the caterpillars. I have no previous recollection of having seen kites preying upon these caterpillars and I believe the latter to be so unattractive that few birds will eat them.

R. COTTAM.

REVIEW.

The Sudan In Evolution.

A study of the economic, financial, and administrative conditions of the
Anglo-Egyptian Sudan. By Percy F. Martin F. R. G. S.

This is a considerable work of about 550 pages, with a map. It describes the Sudan Government in detail, and gives a short note on each of the provinces, and there are three chapters of hints to the intending traveller to the Sudan besides those on sport.

The general scheme of the work is admirable, but the execution is not so happy. In such a work accuracy is all-important, and though Mr. Martin disarms criticism to some degree by pointing out that the publication of the work was delayed by the War, yet the errors are not due so much to the information being out of date, as they are errors of observation or of transcription.

An instance is on page 95 the description of the ardeb of capacity as 2.2 lbs; on page 141, the names of the old provinces of the Sudan are spelled erroneously and are not correct in fact. On page 154 there is a confusion between the administration of Police and Stores, and the distribution of staff for the work of police in Khartoum Province. Valuable as was the work of Mr. Blomberg, it applied only to the one province and did not involve a reorganisation of the whole police of the country, for which indeed it was not suitable. On page 178 the author refers to the money possessed by Fellata, a statement that requires great qualification since not one in a hundred has money to pay his fare to Khartoum until he has earned it on the cotton fields of Tokar. The criticism of "matmuras" on page 327 is hardly a fair one, as grain can be and has been kept for many years in these native stores without serious damage. Nor is there any sign of the natives adopting any other method to any appreciable degree. What Mr. Martin means by 'Khatweh' on page 232 is a mystery, and his statement that 'Sothis' is the word used by Egyptians and Sudanese for Sirius (page 14) is incorrect.

He is at pains to give the rules of transliteration and it is therefore disappointing to find 'habab', for a dust-storm.

The writing of Brown for Broun p. 349 or Anak for Anuak p. 406 are slight but irritating errors, but the description of camel transport in the Bahr el Ghazal p. 412 is frankly misleading, whilst the brief history of el Idrisi on p. 436 is a perversion of the facts.

Again on page 483 the visit of General Wingate was in the winter of 1906/1907 not as stated in 1905.

It is not our intention however to attempt to draw attention to all the errors in this book, but it is undeniable that the value of such a book as a work of reference rests on its accuracy, and it is regrettable that so much trouble should have been taken without adding the final touch which would have made the book really useful.

We do not attempt to join issue with the author on matters of opinion, though at times he hazards statements that would hardly bear the examination of an expert. We hope however that any subsequent edition of his work will be relieved of the comments on a certain class of traveller on pp. 180 foll. which have nothing to do with the Sudan and are in deplorable taste.

ERRATA.

(Vol. IV. No. 3.)

The following corrections in Dr. Seligman's articles *Note on Dreams* are brought to the notice of readers by request of the writer;

Footnote to page 159;

Line 2 for "sister" read MOTHER

Line 8 for "sister" read MOTHER.