

السجل والذكريات

Sudan Notes and Records

المدمجة فيها INCORPORATING

وقائع الجمعية الفلسفية بالسودان

Proceedings of the Philosophical Society of the Sudan.

DT
118
594
32

VOLUME XXXII

1951

Patron

Sir Robert George Howe, G.B.E., K.C.M.G.

Committee

Chairman Sir James Robertson, K.B.E., 3N.

Editor T. H. B. Mynors

R. L. Knight

M. Jolliffe

P. L. Shinnie

Mekki el Manna

H. S. Darling

LIST OF CONTENTS.

	Page
EDITORIAL NOTES	2 178
ARTICLES :	
Problems of fisheries in the area affected by the Equatorial Nile Project : ed. by H. SANDON	5
History of Darfur 1200-1700 A. D. I and II : A. J. ARKELL	37. 207
Sudanese camel girth in double weave : G. M. CROWFOOT	71
Nuer spokesman : B. A. LEWIS	77
Rulers of the Sudan 1820-1885 : R. L. HILL	85
Notes on tsetse flies in the Sudan : D. J. LEWIS	96
<i>Kairi</i> cultivation in Moru District : J. R. CATFORD	106
The White Nile and the Sobat : J. W. WRIGHT	113
Insects and grain storage in the Sudan : H. S. DARLING	131
The dairy of Abbas Bey	179
Birth of a dhow : G. R. MILWARD	197
Notes on the Ngork Dinka : P. P. HOWELL	239
Proposed sampling census in the Sudan : C. H. HARVIE	294
Note on zeolite artefacts : G. ANDREW	308
Spelling of place names in the Sudan : J. W. WRIGHT & G. JANSON SMITH	311
NOTES :	
Mograka Church : P. L. SHINNIE	150
The East African Institute of Social Research	151
Adventurous Life of Faraj Sadik : A. C. HOPE	134
Report of the Philosophical Society on 1949-1950 Sessions	159
Petridophyta newly recorded from the Sudan : K. N. G. MACLEAY	160
Decorated pipes of the Fung : H. G. BALFOUR PAUL	325
Ancient villages in Khor Nubt : G. E. R. SANDARS & T. R. H. OWEN	326
Medical investigations of the U.S. Navy : H. HOOGSTRAAL	333
A scorpion in captivity : MANSOUR A. HASEEB	338
Mount Lotuke, Didinga Hills : J. K. JACKSON	339
BOOK REVIEWS	165, 342
BIBLIOGRAPHY	166
CORRESPONDENCE	
Sudan thanatophidia : Fung origins : Caves in the sandstone hills N. of Omdurman	173
Fung origins	349

السودان لىنو ولىن فرى سىسائىل و مئد و نائىت

Sudan Notes and Records

المنديجة فيها INCORPORATING

وقائع الجمعية الفلسفية بالسودان

Proceedings of the Philosophical Society of the Sudan.

LIST OF CONTENTS

	Page.
EDITORIAL NOTES	2
ARTICLES :	
Problems of Fisheries in the area affected by the Equatorial Nile Project: Ed. by H. SANDON	5
The History of Darfur 1200-1700 A.D. (I) : A. J. ARKELL ..	37
The Sudanese Camel Girth in double weave:	
G. M. CROWFOOT	71
Nuer Spokesmen : B. A. LEWIS	77
Rulers of the Sudan 1820-1885 : R. L. HILL	85
Notes on Tsetse flies in the Sudan : D. J. LEWIS	96
<i>Katiri</i> Cultivation in Moru District : J. R. CATFORD ..	106
The White Nile and the Sobat : J. W. WRIGHT	113
Insects and Grain Storage in the Sudan : H. S. DARLING ..	131
NOTES :	
Mograka Church : P. L. SHINNIE	150
The East African Institute of Social Research	151
The Adventurous Life of Faraj Sadik : A. C. HOPE	154
Report of the Philosophical Society on 1949-50 Session ..	159
Pteridophyta newly recorded from the Sudan : K. N. G. MACLEAY ..	160
REVIEWS	165
SUDAN BIBLIOGRAPHY	166
CORRESPONDENCE	173

NOTES TO CONTRIBUTORS.

Contributions and correspondence are welcomed and should be addressed to the Editor. Contributors receive thirty free copies of articles published : further copies can be supplied at cost price on request. MSS. and photographs etc. are not returned unless specially asked for, and no liability is accepted.

Where possible, proofs are submitted to authors for correction : authors are requested to make only essential corrections in the proofs. The Editor reserves the right to make any corrections or alterations he may deem necessary.

To assist in the preparation of material for the printer, contributors are asked to observe the following rules :—

1. Articles should be submitted, if possible, in typescript (though this is not absolutely essential), typed with double spacing, on one side of the paper only.

2. Arabic or other foreign words, including Latin scientific names of species etc., should be underlined (not in inverted commas) and where necessary followed by the English translation in brackets. The Arabic form for the word may also be given. Titles (but not authors) of books or periodicals mentioned should also be underlined (not in inverted commas). If there are several references it is better to list them at the end and refer to them in the text by numbers or by author and date only.

3. Articles should where possible be divided by suitable headings and subheadings. Paragraphs should not be numbered. Contributors are invited to add a Summary to their articles.

4. For the translation of Arabic words the orthography of the Journal, and for place names that of the Survey Dept. (R.G.S. II), should be followed ; for the other African languages that of the International African Institute may be followed.

5. Maps and diagrams should be drawn as neatly and simply as possible in black ink on white paper. Where possible a portion of an existing map should be used and the Survey Department should be consulted at an early stage. While unable to undertake the drawing of special maps they may be able to modify an existing one to suit the purposes of the contributor.

DT
118
S94
v. 33
pt. 1

السودان في رسائل ومدونات

SUDAN NOTES AND RECORDS

FOUNDED 1918

Patron

Sir Robert George Howe, G.B.E., K.C.M.G.

Committee

Chairman Sir James Robertson, K.B.E., 3N,

Editor T. H. B. Myrors.

R. L. Knight.

M. Jolliffe

P. L. Shinnie

Mekki el Manna

H. S. Darling

Sudan Notes and Records exists to promote the collection, exchange and publication of information about the Sudan in every aspect of its history, its people and its institutions, including not only the social but also the natural sciences. Any views expressed in any contribution published are those of the contributor alone and the Committee restricts itself to approving any material for publication as a contribution to knowledge in the Sudan.

Reproduction of any material appearing in this journal is freely permitted provided suitable acknowledgement of the source is made.

Sudan Notes and Records is published in or about June and December each year. The Annual Subscription, payable in advance, is 500m/ms. (in Egypt and the Sudan) or 18/- d., and can best be arranged by Bankers Order. Back numbers, with certain exceptions, and offprints of certain articles can be obtained from, and **Subscriptions and notification of changes of address should be sent to Honorary Treasurer or the agents Messrs. Luzac and Co., 46, Great Russell Street, London, W.C.1.** Copies may also be obtained from Sudan Bookshop, Khartoum and Wad Medani.

Editor,
P. O. Box 555,
Khartoum.

Hon. Treasurer,
P. O. Box 555,
Khartoum.

EDITORIAL NOTES.

As briefly noted in the last issue the Committee has at last decided to raise the subscription rate to 75 P.T. (18/-) with effect from 1st. January 1951, that is, from this number onwards. The rate had stood at 50 P.T. since the foundation of the Journal in 1918, while costs have of course risen steadily. It is likely that the size of each number will be slightly increased.

x x x x x x x

It is regretted that the map illustrating General Gage's article in Volume 31 Part 1 (facing p. 16) was reduced in size for reproduction without suitable reduction for the scale and representative fraction. These should have read "Scale 1: 485760 or 1 inch to 7 2/3 miles." There was also a printing error in the footnote on page 154 of the same number which should have read "Goz Regab is accepted as an exception in the same way as 'Khartoum' which should be 'El Khartoum' "

x x x x x x x

We would draw the attention of our readers to the "Illustrated Guide to Nile Fish" which is now on sale at the Sudan Bookshops or from this office or our agents in London, Messrs. Luzac & Co. There is a complete descriptive account of each fish, 23 coloured illustrations and several line drawings. The price is only 25 P.T. (6/6) plus postage, which in the Sudan is 2 P.T. This little handbook is the only work of its kind and should be of interest both to the scientist and to the amateur.

x x x x x x x

In Volume 31 Part 2 the Note by Mr. Shinnie on "Fragments of stamped pottery" contained certain Coptic letters, which in the absence of special types were to be rendered where possible by similar letters of the Greek alphabet. Unfortunately the printers substituted "lower case" for capital letters of the Greek type and as these do not correspond to Coptic letters, the sense of the Note was obscured, but it is hoped that those interested in the subject perceived the mistake and did not attribute the lapse to Mr. Shinnie.

We publish also a note on the East African Institute of Social Research now established at Makerere College, which may arouse some envy. The territories of East and West Africa are devoting much attention to the subject ; although the Sudan Government has on several occasions assisted researches of a more limited anthropological nature, too little study has been carried out on the many social and economic problems in the north, nor are Sudanese being sufficiently encouraged to undertake such objective studies of these problems as may help to mitigate or avoid the evils of the purely political approach.

x x x x x x x

Owing to the prohibitive cost of small editions it appears most unlikely that there can be any reprinting of the early Volumes (roughly Nos. 1 — 12) which are out of stock. But there must be many early subscribers who have complete or nearly complete sets and the Editor would be glad to buy some for supply to libraries and museums which are anxious to get hold of complete sets : the current market price could be paid. Odd numbers from Volumes 1 —12 might also be bought.

NOTES ON PRINCIPAL CONTRIBUTORS.

- A. J. ARKELL : Lecturer in Egyptology, University of London. Formerly Commissioner for Archaeology in the Sudan Government, also Editor of *Sudan Notes And Records* and author of many articles on archaeology.
- G. M. CROWFOOT : wife of a former Director of Education in the Sudan Government.
- B. A. LEWIS: a member of the Sudan Political Service, at present Resident, Geneina. Has served for a number of years in Upper Nile Province.
- R. L. HILL : Lecturer in the Department of Oriental Studies, University of Durham. Formerly Lecturer in the School of Arts, Gordon College.
- D. J. LEWIS : Medical Entomologist, Sudan Ministry of Health.
- J. R. CATFORD : Inspector of Agriculture, attached to the Equatoria Projects Board.
- J. W. WRIGHT : Inspector, Topographical Section, Surveys Dept.
- H. S. DARLING : Lecturer in the School of Agriculture, Gordon College.

SUDAN NOTES AND RECORDS

INCORPORATING
PROCEEDINGS OF THE PHILOSOPHICAL SOCIETY
OF THE SUDAN.

VOL. XXX11

Part 1.

JUNE 1951

THE PROBLEMS OF FISHERIES IN THE AREA AFFECTED BY THE EQUATORIAL NILE PROJECT.

Edited by H. Sandon.

CONTENTS

SECTION I.

Introduction, by the Jonglei Investigation Team

SECTION II.

The Gordon Memorial College Expedition

- A. Introduction
- B. Zoological Investigations
- C. Botanical Investigations
- D. Chemical Investigations

SECTION III.

The work of the Fisheries Officer

- A. Experiments on the use of nets
- B. Experiments on methods of preserving fish
- C. Training of Nilotic Staff
- D. Observations on existing Local Fisheries
- E. General Observations of Fish

SECTION IV.

Report on the Analysis of a Sample of Fishmeal from Aweil

References and Glossary

SECTION I.

INTRODUCTION

(By The Jonglei Investigation Team)

The Equatorial Nile Project, or the Jonglei Scheme as it is more often called, will result in a series of changes in the existing river regime from Nimule on the Sudan — Uganda border to somewhere in the vicinity of Kosti in the north. The implications of this vast scheme for control of the White Nile are described in greater detail elsewhere (2). Briefly the effects will be as follows :—

From Nimule to canal head at Jonglei, the region here referred to as the "Southern Zone", the present seasonal variation of river levels will be altered radically. In the "timely season" of the year, the time when water is required for irrigation further north, the Albert Dam will be opened and the canal running to full capacity. At this time of year the river level will be high. In the "untimely season" when the Dam is closed and a discharge maintained sufficient only to allow for navigation and to prevent weed growth, the river will be low. Since the "timely" and "untimely" seasons correspond roughly to the dry and rainy seasons of the year respectively, the effect will be to reverse the present seasonal variation.

In the "Central Zone," from canal head to Buffalo Cape on the Bahr el Jebel and Fangak on the Bahr el Zeraf, the natural river channels will be kept permanently at a low level without great fluctuation, while the canal will take the bulk of increased discharge during the "timely season". Here, in the area which corresponds to the Sudd region, the object is to prevent spilling into the surrounding swamps, at present an important feature of the river regime.

North of these two points in the "Northern Zone", owing to the back-water effect of the river Sobat flood during the rainy season, and the effects of the high discharge from the canal during the dry season, the river will remain permanently at a high level throughout the year and there will be a great reduction in the present seasonal fluctuation.

It will be seen that the maximum flow of water throughout these reaches of the White Nile will no longer coincide with the local rainy season and drastic changes will follow both in the general ecology of the whole vast area and in the traditional economy of the inhabitants which is intimately adapted to the present annual sequence of natural changes.

Among the problems that will be raised by the development of this Project is that of the effects on fish and fisheries. This problem has already

Luzon
8-13-53
83242

been stated elsewhere (2) and a summary account given of the part which fishing activities play in the subsistence economy of the people. It was shown that fish are of paramount importance in their present economy both as a subsidiary item of diet and as an essential standby during the lean time of the year when grain is running short before the harvest or throughout the year when the crops have partially or entirely failed owing to adverse climatic conditions. Some peoples rely on fish to a greater extent than others, ranging from those whose fishing activities are seasonal and supplementary to normal diet, to those who rely almost entirely on fish, like the Thany Dinka, the Balang of the Nuer and certain elements of the Shilluk. This distinction is important because, as will be seen later, the latter may be called upon to develop their fisheries commercially for the general benefit of others whose usual fishing methods may well be rendered ineffective by altered hydrological conditions.

For the most part only those regions are fully exploited where fish are readily obtainable by the use of rudimentary methods such as the spear, harpoon and trap, and fishing remains an unspecialized communal activity. As yet a cash economy is limited among the Nilotics and there is little commercial exploitation except in the northern reaches of the Northern Zone or further south in the immediate vicinity of large towns. This is again an important fact to note because fishing methods may have to be altered under the new river regime, and the new methods suggested are on the whole best suited to use by specialist and commercial elements in society rather than by all and sundry. Moreover the use of trammel, gill or drag nets not only requires capital and training in the handling and maintenance of boats and nets but may also be a destructive factor unless carefully controlled.

As far as the Jonglei Investigation is concerned the problems are extremely complex, especially as the results of the Project are likely to be different in the three major zones just defined. The three most important questions are :—

- (a) Will the fish population in any given area, or over-all, be reduced as a result of the changing hydrological conditions? The most serious effects would probably be those due to alterations or limitations in their breeding grounds.
- (b) Will it still be possible to use indigenous methods of fishing or will these methods become ineffective under the new conditions rendering the fish less easy to procure or even not available at all to the population unless new methods are introduced?
- (c) Will the development of existing potentialities on a commercial scale be in any way affected?

- (d) In view of the extremely perishable nature of dead fish, are any improvements in the current methods of marketing or processing the catch necessary or desirable in order that the food may reach the consumers in a state fit for consumption?

It may not be possible to answer the first question until the Project has reached its final stage. It has been stated elsewhere (2) that "it seems reasonable to assume that no general change in the fish population should be expected, but local rangings and shiftings. The vast reservoir of fishes in the main rivers and adjacent swamps will probably not be as deeply—if at all—affected as in some khors and toiches." This assumption, though possibly true, must not in our opinion be accepted until we have further knowledge of the numbers, distribution, ecological requirements and migratory, breeding and other habits of the fishes of the Nile. There is definitely a need for further research in this direction.

The second question is more easily answered, at any rate in some reaches. In the Southern Zone, the reversal of seasonal levels may affect, not only the fish themselves, but also existing methods of catching them. In that area fishing is on the whole a dry season occupation and during the dry season under the new regime the river level will be high. It is, however, probably necessary to make a distinction here between what may be called "inland fisheries" i.e. fishing on inland waterways which normally dry out in the summer — and "Nile fisheries" along the lagoons and off-shoots of the main river. This distinction applies also to the Central Zone where it is less easy to forecast the results of the Project. Here the rivers will be confined within their banks and this may mean that inland waterways and pools which are associated with the rise and fall of the Bahr el Jebel and the Bahr el Zeraf may dry out altogether or dry out for much longer periods in the year because they will only be fed by rain water. Again the fish themselves may be cut off from entering such waterways in what appears to be an annual migration. In the Northern Zone, where there is considerable exploitation of the lagoons which border the Nile especially when the river is low, the river level will be permanently high and the seasonal fluctuations will be much reduced. It may be assumed that deep-water fishing methods comparable to those employed in the Great Lakes in East Africa will have to be used.

The various investigations described in the following pages reveal that the fisheries are among the important natural resources of this part of the Sudan. They already play a considerable part in the primitive economy of the inhabitants and are capable of further development. Their maintenance with increased exploitation and under the changing conditions that will be

produced by the Equatorial Nile Project necessitate wise guidance which can only be given on the basis of further investigation, and recommendations to this effect have been submitted through appropriate channels. The main requirements may be summarised as follows :—

(a) Research is required on the extent of existing stocks of edible fish, on the capacity of these stocks to support more intensive exploitation and on the probable effects of the Equatorial Nile Project upon them. This work requires the services of a fully-qualified hydrobiologist.

(b) Further experiments are required on methods of fishing suitable for adoption in different localities and under different conditions and on methods of curing fish. These should be carried out by the Fisheries Officer. He should also organise the collection of commercial fisheries statistics and similar data for the use of the hydrobiologist.

(c) It is desirable that tests should be made of methods of fish farming as a possible means of stabilising and increasing supplies of fish. This work will be especially desirable if the Project should prove to have serious adverse effects on the fish supplies. Much time and expense will be saved if these experiments are carried out under the supervision of someone with experience of fish farming under tropical conditions.

(d) Continual attention must be paid to the part played by fish in the diet and economy of the people and to the problems of their traditional and prescriptive rights. This is important in order to ensure that whatever proposals may be made for the protection, control and the development of the fisheries shall be acceptable to the local people and shall bring the maximum benefit to them.

There are obviously many other aspects of the problem some of which apply only locally, others of which are general. Simple answers cannot be given to any of them and extensive investigations are required to provide the answer needed as the basis of policies for development or alternative livelihood in this area.

Whether we are dealing specifically with the problem of the Equatorial Nile Project, its effects in the Sudan and the remedial measures which may in some cases be necessary, or whether we are concerned only with the problem of immediate economic development, these requirements are identical. The report which follows is intended to provide not only a record of recent work in the subject, but an encouragement to those who may be interested to supply further information. Such information, including observations on the habits of the fishes of the Nile, the part played by fish in the diet of the people, and methods of catching them, will be of great value to those whose work is devoted to these problems.

During the period under review, investigations have been undertaken along the lines described in the following three sections,

SECTION II.

THE GORDON MEMORIAL COLLEGE EXPEDITION.

INTRODUCTION

A preliminary report on the fish of the Sudd region was written in 1947 by Dr. J. Rzoska, Ph. D. and Sabet Eff. Girgis Assabgi, B. Sc. (2,a) This represents the results of only a short period of work in the Upper Nile, but provides a most useful background to future research. The authors made suggestions for future work and detailed some of the many questions which should be investigated, as follows:—

- (a) Ecology of the main fish species (number, age-classes, sizes, feeding, seasonal migrations and spawning habits).
- (b) Local distribution of species.
- (c) Present coincidence of fishing operations with migration of fishes
- (d) Changes likely to occur in main fishing regions (to be investigated locally). Role which fish play regionally in diet.
- (e) Trials with improved fishing methods in different places.
Determination of suitable sizes of nets. Protection of young fish.

The authors say : "Such an investigation will fulfil two important tasks. It will give a comprehensive and scientifically sound basis for the estimating of changes to be expected when the Jonglei Scheme comes off. Secondly, it will form the basis for future development in the investigated region."

In 1948 an attempt was made to obtain the services of a fisheries expert for the Jonglei Investigation Team, but this was unsuccessful. In view of this, it was decided that certain scientists already in the country and working at Gordon Memorial College should be invited to carry out a further stage of the preliminary investigation. Accordingly Drs. H. Sandon and J. Rzoska (zoologists), Dr. K.L. MacLeay (botanist) and Mr. J.H. Pyle (chemist) together with two assistants arrived in Malakal at the end of December 1948. They were joined there by Mr. Taylor, the newly appointed Fisheries Officer of the Department of Economics and Trade. The SRS Dal was placed at their disposal for the duration of the visit.

In view of the short time available for the expedition, which was limited to the College winter vacation, only a strictly limited programme of work could be attempted and it was decided to restrict activities to the Malakal-Lake No -Buffalo Cape area. The greater part of this area falls within the Northern Zone in which the water levels, both in the timely and untimely seasons, after completion of the Jonglei Canal will be approximately the same as those at the time the visit. Some of the lagoons and deeper waters

in this area are already fished extensively by the local population, mostly Shilluk. There is a more or less permanent fishing camp at the entrance to Lake No, and some places nearer Malakal, including Khor Atar and the Sobat Mouth, are exploited both by Shilluk and by commercial fishermen from the North.

In accordance with this programme, the Dal left Malakal on the evening of 27th December, and stops were made at which observations and collections were taken and fishing carried out, or attempted, at the following stations :—

Date	Station
28-30 Dec.	Entrance to Khor Atar.
3-Dec.-2 Jan.	Entrance to Khor Berboi.
3- 4 ,,	Entrance to Lake No.
4- 5 ,,	Lake No—old Factory site.
5- 6 ,,	,, ,, —entrance.
6- 7 ,,	,, ,, —near middle of main channel between entrance and factory site.
7- 8 ,,	,, ,, —south shore.
8- 9 ,,	Bahr El Jebel —Buffalo Cape.
9-10 ,,	,, ,, ,, —Kilo 60.
11-12 ,,	Khor Atar—end of first reach.
12-13 ,,	Khor Lolle, junction with main river.
13-14 ,,	Mouth of Sobat R.

Organisation of Work.

R. Taylor was responsible for all fishing operations and for the care of nets. He trained the Shilluk fisherman in handling boats and nets and in repairing the latter. He also carried out some tests on the salting and smoking of the catch.

H. Sandon identified, measured and recorded the fish as they were brought in. He examined selected samples for stomach contents, condition of gonads, internal parasites etc. and made a systematic search for fry (as an indication of local breeding) by collecting the small fish found among the aquatic vegetation and in pools etc.

J. Rzoska was primarily concerned with the general hydrobiological conditions and especially with the plankton and invertebrate fauna. He collaborated in the general the work on fish and with Mr. Pyle in the taking of suitable representative samples for water analysis. He collected a number of ecto-parasitic crustacea from the fish and accompanied Dr. MacLeay on a walk from Buffalo Cape to Kilo 60 in the course of which interesting material was collected.

J. Pyle and K. MacLeay were chemist and botanist respectively of the party. The modified programme of work, based essentially on considerations of fishing, made it impossible for either of them to carry out fully consistent series of investigations. Nevertheless important data were collected as set out in later sections of this report.

ZOOLOGICAL INVESTIGATIONS

Fishing Operations.

A set of nets for experimental fishing (namely large and a small mesh gill nets, large and small mesh trammels, a seine and casting net) were used, as one of the main objects of the work was to test the suitability of such nets for use under local conditions.

One professional northern Sudanese fisherman and six Shilluk were employed and were trained to handle the boats and nets and to repair the latter. The normal programme was as follows :—the nets were shot at about 4.30 to 5 p.m., under-run and reshot after removal of the fish at about 9.30 to 10. p.m. and then left till daybreak when they were hauled. Attempts to use the nets during daylight were quite unsuccessful in spite of the opacity of the water.

As the same nets were used continuously by the Fisheries Officer after the departure of the College party, a description of them and discussion of their respective merits can be left for consideration in his report (Section III below). The following points, however, quickly emerged :

- (a) The Shilluk fishermen have no difficulty in learning to adopt new methods of fishing, including the handling of boats and nets and the repairing of the latter.
- (b) Using the methods described above, ten times this number of nets could be handled by the boats. One boat working all night, with a reasonable rest period, should be able to shoot, under-run and haul between three and four thousand yards of net.
- (c) A motor launch capable of towing fishing boats is, however essential for extended experimental fishing of this kind.

Identification of Fish.

The following species of fish, about 30 in all, were represented in the catches made with the various nets (including casting nets) :

Osteoglossidae : *Heterotis niloticus*.

Mormyridae : *Petrocephalus bane*, *Marcusenius isidori*, *Gnathonemus cyprinoides*, *Mormyrus caschive*, *Gymnarchus niloticus*.

Characinidae : *Hydrocyon forskalii*, *H. brevis* (probably *H. lineatus*)

Alestes baremose, *A. dentex*, *A. macrolepidotus*, *A. nurse*, *Distichodus*

niloticus, *D. brevipinnis*, *D. sp.*, *Citharinus citharus*, *C. latus*.

Cyprinidae : *Labeo coubie*, *L. niloticus*.

Siluridae : *Clarias anguillaris*, *Heterobranchus bidorsalis*, *Schilbe mystus*,
S. uranoscopus, *Eutropius niloticus*, *Clarotes laticeps*, *Auchenoglanis*
biscutatus, *Synodontis membranaceus*, *S. clarias*, *S. schall*, *S. sp.*

Centropomidae : *Lates nilotica*.

Cichlidae : *Tilapia nilotica*.

Arabic and local names of these fish are given by Sabet Girgis (6). The common ones are also given below.

Numerous collections of small fish from the riverside vegetation were made by means of a pond-net with the primary object of finding the young of any species which might breed in these localities. A few young were found, of which the most important were *Lates* and *Tilapia*, but the great bulk of these collections consisted of miniature types (*Cyprinodonts* and the smaller *Cyprinoids*) of no economic importance except as factors in the general ecology of the water and possibly in connection with the mosquito reduction. A report on these small fish will be published separately, together with an account of the feeding habits of the larger fish as deduced from the nature of their stomach contents.

The Numbers of Fish.

It is unfortunate that the visit had to take place during January, notoriously a bad month for fishing in this area. Professional fishermen report that their earnings are small during that month and are secured with much greater expenditure of time, labour and nets (which are longer and of larger mesh) than at other times. It is not surprising therefore that catches were on the whole small. No doubt, had it been possible to stay longer at each station in order to find out just the best spot for fishing, the catches would have been bigger, for the patchy distribution of fish even in small closed bodies of water is well known. This could not, however, have made any material difference to the general conclusion that at the time of the visit most of the important kinds of fish are present in only small numbers if at all. The extreme scarcity of *Tilapia (bulti)* is especially noticeable in view of the fact that the large gill net had been especially selected after consultation with Omdurman fishermen as a "*bulti*" net.

The poor catches are the more striking as several of the localities were chosen because they had previously been fished by Howell and found to be very rich. In the lagoon at Kilo 60 for instance, with two shots of a small seine, Howell in March had taken 18 large *Tilapia* (average weight over 4 lbs) and 10 large *Citharinus*, whereas the expedition after leaving

all four nets out all night, in addition to using the seine, secured only 39 fish in all including only one *Citharinus* and no *Tilapias*.

Migrations of Fish.

These important seasonal changes in the abundance of fish are undoubtedly due, primarily at any rate, to migrations. Knowledge of where the fish are to be found at different seasons of the year is obviously important in planning the general set-up of fishing operations. An understanding of why they migrate from one place to another is equally important when the effects of future changes in the management of the river are under discussion. A thorough study of these migrations must therefore occupy first place in any programme of fisheries investigation.

A number of views are current on the question of where the fish go to and of the relation of their migrations to the times and places of breeding. These views are, however, not altogether consistent and are difficult to fit together into a clear picture. According to Howell it is generally believed that during December and January the fish are inland (i.e. away from the main rivers) and that they only move out of the grass-filled khors into deeper and fishable waters from February onwards. After this they congregate in the lagoons, which are by then much shallower than in January and have dry sand-banks onto which nets can be dragged, thus making net-fishing easy. The catch at that time is varied, including large *Tilapias* and *Heterotis* together with considerable quantities of small *Hydrocyon* and *Alestes* which are salted and packed in tins for export.

Stubbs (9) states that at Aweil the toiches provide the main spawning grounds for fish but he also mentions (8) that the main seasonal catches from these toiches consist of small fish not exceeding half a pound in weight, such as *Gnathonemus* and *Petrocephalus*. No information is given as to the flood season habitats of the larger fish, but *Tilapia* is said to breed in swampy pools at that time. Omdurman fishermen in conversation with Mr. Taylor expressed the opinion that the *Tilapias* from the Malakal—L.No reach migrate northwards far beyond Malakal for breeding and return southwards afterwards. Howell states that in this reach the breeding season of fish is believed to be between June and August, i.e. before the river has begun to rise steeply although the rains have begun to fall. At this time the inland waters and khors have not filled to allow any large scale-migration and it is supposed that the fish spawn in the shallow water and among the aquatic vegetation of the river banks and river-side lagoons.

Several writers, including Bloss (5) have expressed the view that the swamps and inland lakes, such as L. No, act as all-the-year-round reservoirs of fish, supplying the rivers and also serving as the main breeding grounds.

This very plausible belief seems, however, to be incorrect since the quiet and moderately shallow waters of L. No and the lagoon near Kilo 60 were found to show the same seasonal deficiency of fish as the other localities.

Even if the requirements of breeding were the main reason for the migrations, they do not affect all individuals of a species alike. Small Nile Perch, at most a few weeks old, were taken in the pond net at L. No and Khor Lolle. Young Tilapia, Distichodus and Citharinus were likewise taken in the casting net at Buffalo Cape and elsewhere, having presumably been bred in the vicinities of the places where they were caught.

Apart from the requirements of breeding, the two factors most likely to provide the inducements for migration are the supplies of food and of oxygen, but there is no evidence of any serious deficiencies of either of these. There is certainly no lack of suitable food for the plant- or mud-eaters (Labeo, many Mormyrids, Distichodus, Citharinus etc.). The stomachs of the carnivorous types, whether feeding mainly on zooplankton (*Synodontis membranaceus*) or on worms and chironomid or other insect larvae picked up from the bottom, were usually well filled with food and most of the fish examined contained large masses of fat. There was evidently no malnutrition among them.

As for oxygen, though Mr. Pyle's analyses show rather low contents on the whole, these were by no means low enough to constitute a limiting factor for animal life. Planktonic crustacea, whose oxygen requirements are considerable, were tolerably, or even very, abundant in all the waters examined. Fish such as the Characinidae which show no special adaptation to oxygen deficiency and which, by their activity, must have high requirements in this matter were among the most common, while those which are adapted in one way or another to life under conditions of oxygen shortage (Lungfish, Clarias, Heterobranchus, Polypterus) were either completely absent or very scarce.

It is clear therefore that much detailed study is required before reliable answers can be given to either of the questions concerning migration, namely where do the fish migrate to and why do they do so. These answers will only become clear when wide statements about fish in general are replaced by precise facts about each species of fish. The differences in the movements of different kinds of fish are well illustrated in the notes on Tilapia, Heterotis, Mormyrus and Citharinus given at the end of the account of the work of the Fisheries Officer. Even assuming that the main migrations are towards the flooded lands, the requirements with respect to depth of water etc. of the larger fish, such as mature Tilapia or Nile Perch, are almost certainly very different from those of smaller fish and the places to which

they go will therefore be different. Even within a single species there is some difference in behaviour among different individuals and it is possible that in some such as *Tilapia*, the situation may be similar to that which has been found in certain commercial marine fish, where a single species may comprise a number of more or less distinct populations each with its distinctive norms of behaviour. It is also possible that different age groups may behave differently. Such possibilities have to be borne in mind in attempting to interpret the effects of any future changes in hydrological conditions since these changes may affect different species or even different individuals or groups within a species differently.

It is of some interest that the sojourn at L.No covered the anniversary of that of Sir S. Baker in 1863 and that he made a special note on that day (6th Jan.) of having caught perch and *bulti* in a net. He also mentions having seen the Shilluk harpooning fish from the banks near Malakal a few days previously—an occupation which would have been completely fruitless at the time of our visit. We have not searched other past records for similar observations and not much weight should be attached to a casual note of this kind. It serves to remind us, however, that apart from the seasonal movements of fish which we have been considering, there may be long-range changes whose effects are only evident over a long series of years. Statistically adequate records of fish numbers and sizes continued regularly year after year are therefore necessary in order to provide a basis for estimating the potential capacity of the area or of interpreting such changes as will result from the regulation of the river.

Edibility of Fish

As pointed out in the previous report of J. Rzoska and Sabet Girgis(2), among the Nilotic tribes fish are valued more by quantity than by quality, any kind of fish being eaten. Nevertheless differences in taste do exist between different tribes. By far the most abundant of all the fish taken in the nets were the unattractive *gargur* (*Synodontis*) and it was noticed that the crew of the Dal did a good trade by selling the miserable dried remains (little more than the heads and backbones) of these fish to the Nuer at Kilo 60, a fact which suggests a considerable unsatisfied need for fish.

Many of the fish caught (notably Lates, *Tilapia*, *Heterotis*, *Schilbe*) are of excellent quality and are appreciated even by Europeans. The Characins (*Hydrocyon*, *Citharinus*, *Alestes*) and the Cyprinoids (*Labeo*) lose in attractiveness by the great number of small bones that they contain but are otherwise of good quality. The smaller Characins, however

(*Alestes* and young Hydrocyons), in the form of *fasikh*, are of considerable commercial importance. The gonads of certain Cyprinids may be mildly poisonous (as is the case with some of their relatives in other countries) and the same may be true of *Tetraodon*, even though this fish is commonly sold in *suqs* throughout the Sudan. But with these doubtful exceptions there seems to be no fish that cannot be converted into a nutritious and acceptable form either as fresh fish, dried or smoked fish, fish meal or fish paste. Obviously very cheap and simple methods of curing are required to give a product suitable for local consumption but the quantity and quality of the fish suggest that the possibility of introducing more refined methods of processing aimed at products capable of competing successfully in the commercial market merits careful consideration. A thorough exploration of possible methods of processing fish and of the adaptation of such methods to local conditions is very strongly recommended.

Miscellaneous

The general zoological collections will take a considerable time for complete identification. This will be done partly by the members of the team in Khartoum and during their vacations in England in collaboration with specialists at the British Museum. Other collections, including those of fish parasites, will be sent to specialists for identification. Together with the collections made by J. Rzoska and S. Girgis Assabgi during the previous visit in 1947, they will doubtless add considerably to existing knowledge of the fresh water fauna of the region and will provide a firm foundation for further work.

Although no collections were made of the bottom fauna (for want of suitable collecting gear), the stomach contents of some of the bottom-feeding fish indicated that, in addition to diatoms and other vegetable matter, a considerable population of Chironomid larvae, molluscs and other animals must be present that would repay study.

Conclusions and Recommendations

Though discussion of the results obtained with the experimental nets is left for inclusion in the account of the work of the Fisheries Officer, the work carried out during the Expedition has gone far toward providing answers to the questions set to it with respect to the possibilities of introducing improved methods of fishing into the area. This cannot be said of the further question concerning the sizes of existing and prospective stocks of fish available for catching. The species and numbers of fish caught at the various times of the year vary very greatly, but the reasons for these variations are still obscure. Much further investigation will be required to

provide the basis for estimates either of the existing potential of the fisheries, or of the effects on it of the various stages of the Project, or for making comprehensive recommendations for the conservation and development of this important natural resource.

Steps should therefore be taken to collect systematic records of all information relevant to the question, including statistics of commercial fisheries. In these matters the cooperation of residents in all parts of the Nile system (not merely the area under immediate consideration) should be enlisted for the purpose of recording observations on such matters as the dates and places of seasonal fishing operations, annual and seasonal changes in the kinds, numbers and sizes of fish caught, the dates and places of breeding, migratory movements etc. Both the Nilotic tribesmen and the professional northern fishermen have extensive traditional and practical knowledge relevant to these questions and every effort should be made to tap these sources of information in a systematic way. For such purposes the cooperation of schools and missions as well as of officials would be of value.

Migration seems to be the most important factor causing the seasonal changes in the abundance of fish and it is essential that this matter should be fully elucidated. It is at present quite impossible to say whether the proposed changes in the regime of the river would facilitate or hinder such migrations or affect the breeding habits which are usually linked with them. Both a short- and long-term programme of research is here required. The former should aim primarily at determining the extent and routes of the migrations and their relations to breeding. The latter should aim at an all-round understanding of the ecology of the river since it is this which in the long run determines the lives of the fish. Probably the most urgent problem here is that of the chemical composition of the water since, broadly speaking, water depth, temperature, turbidity and chemical composition are the fundamental determinants of aquatic plant and animal life.

It is possible that, given suitable fishing gear, it would pay to keep channels open into some of the larger stretches of water (such as those west and south-west of Wath Wang Kec) which are accessible at present only to canoes, if at all. Although it was not possible for any of these to be visited during the expedition, they have the appearance of potential richness in fish life and their opening-up would increase very greatly the area available for fishing.

Sooner or later fishing, like other food industries, must pass from a collecting to a producing stage. Various systems of fish farming are being introduced extensively into tropical countries and will ultimately have

to be introduced here. The best prospect of success on a large scale is through the progressive rational control of the natural environments of the fish. It is desirable therefore that systematic records be kept of the ecological conditions affecting the fish in some of the smaller, controllable waters. Some of the smaller khors and lagoons such as those just west of Atar would appear to be favourable for this purpose and it would probably be worth while visiting certain of them at regular intervals, fishing systematically and keeping detailed records of the catches, including the fry, together with as many other biological, chemical and general observations as possible.

BOTANICAL INVESTIGATIONS.

When plans for the expedition were first under consideration the inclusion of a botanist in the party was strongly urged by Mr. H. A. Morrice, at that time Chairman of the Jonglei Investigation Team, for the purpose of studying "the peculiarities of sudd vegetation and especially the circumstances in which sudd blocks are formed". As a result of the decision to restrict the work to the northern waters, the main region of sudd growth was not visited. The necessity to select stations for prolonged stops primarily from considerations of fishing, further limited the possibilities of carrying out a consistent programme of botanical work.

Dr. MacLeay reports as follows :—

Detailed investigations into the composition of the subaqueous flora of the river itself, the marginal flora of the river banks and the flora of the toich and the adjacent high ground were carried out at the six different fishing stations which were visited and at which we tied up for one or more nights. A fairly clear picture of the general vegetation bordering the river was obtained from the steamer while travelling by daylight. In addition a drive from Atar School to Malakal and back and a walk from Buffalo Cape to Kilo 60 through the toich in the process of drying out gave one a good general idea of the floristic composition of the higher ground vegetation away from the river which is not subject to inundation and of the toich itself.

Collections of plants composed of Angiosperms, Pteridophytes and Algae were made and from the plankton collected by the zoologists it is hoped that a good idea of the composition of the phytoplankton may be obtained, which will be of use to the fishery investigations which it is proposed to start. These specimens will take some time to identify.

Recommendations :

From such a cursory examination of the region investigated, carried out at a period when the ground was drying up and most plants were

consequently passing out of flower and dying down, one must be very doubtful of drawing conclusions which are in any way reliable. To obtain a true picture of the floristic composition of the region, investigations ought to be carried out at all times of the year and I would like to make the following suggestions for future work in the area :—

(i) Permanent quadrates and transects of adjacent areas of the sudd, toich and high ground should be marked out and examined at all times of the year in order to find out, if possible, the conditions of growth of the constituent members as they presently exist. These conditions are probably dependent on :—water, soil, rate of current, climate (especially very local micro-climates), chemical factors (e.g. available salts and gases, especially oxygen and carbon dioxide, in both water and soil), light and competition with other plants.

(ii) Experimental plots should be laid out to observe the effects of :—

(a) drying up of the sudd, toich and adjacent high ground which will take place in parts of the area. Will toich replace sudd and high ground replace toich ?

(b) Permanent flooding of toich. Will toich die out and be replaced by sudd ? Will toich invade the high ground Will the water-table rise ? Will there be an increased later a seepage ? This will be of special importance in the northern part of the region.

(iii) Further investigations should be carried out from an ecological standpoint in the broadest sense. For this some apparatus would be necessary, as also would be close cooperation with a chemist and or a meteorologist. Frequent visits at various times of the year are necessary. Collaboration with an agriculturalist or a veterinary officer would be more useful than with the Fisheries Officer. The investigation should be completely independent as far as transport is concerned. I have found on the several occasions I have been on trek that the ability to go anywhere one wishes at any particular time is an absolute necessity for such investigations. Transport required would be a small launch or a steamer to serve as a base, a car for land movements, a small boat with motor or sail to work at some distance from the main boat and a canoe to get through the dense fringing vegetation and sudd which a boat of larger beam is incapable of penetrating.

CHEMICAL INVESTIGATIONS.

The primary objects were to repeat the important series of analyses of Nile waters made many years ago by Dr. W. Beam (4), and to determine the amounts of dissolved oxygen under varying conditions. The work was greatly hampered by the non-delivery of some essential reagents. Some of these were replaced by the staff of the Malakal hospital whose generous help was greatly appreciated. Further replacements sent especially from Khartoum were received at Lake No on 5th January, but the original stocks were only delivered at Khor Lolle on the night of the 12-13th January, too late to be used.

In spite of these difficulties, a number of analyses were made which confirmed Beam's results with respect to the amounts of chloride and carbonate (by direct titration with acid) and the absence of sulphates and nitrates. The presence of mud which evolves hydrogen sulphide on exposure to air was, however, not confirmed. This may have been due to the high river levels or to the fact that the reduction of sulphates leading to the formation of this mud only takes place much farther south.

Observed water temperatures ranged from 21.5 ° C to 26.5 ° C., transparency was low (2 metres in Khor Berboi) and while there was much suspended matter in the main current, there was very little or none in lagoons. The water everywhere was light brown, had no smell and was of uniform pH.7.25 by test paper.

The main work was on the oxygen-content of the main river and of still waters in khors and vegetation-locked lagoons. The main rivers appear to have lower oxygen contents than the still waters and photosynthesis by plants during daylight has a very appreciable effect. Not enough oxygen vertical profiles were made in the waters where reeds grow to give clear results, but it seems possible that these may show a transition to conditions prevailing in land-locked lagoons.

At Berboi at 10.15 a.m. a big increase of oxygen with depth was noted with a slight (0.5 °) decrease in temperature, showing apparently a belated night consumption of oxygen in the upper layers. Other samples taken between 10 and 11 a.m. showed generally low oxygen contents at the surface (3.30-3.83 cc per litre at normal temperature and pressure) but there was an indication of a later rise to 4.29 cc in the shade at 1 p.m. and to 4.85 cc at 6.30 at the same spot. The influence of sunlight and floating vegetation is large and contents of 5.02 cc and 8.38 cc (supersaturation) in *Ceratophyllum* in full sunlight were recorded at midday.

Supplies of dissolved oxygen are of basic importance to all forms of aquatic life, including fish and the organisms on which they feed. An

extensive series of investigations would be required to give a clear picture of the variations that occur at different localities and at different depths, times of the day or of season etc. Work on these questions is being continued in the Blue and White Niles in the neighbourhood of Khartoum and it is hoped that a comprehensive report will be published in due time.

Mr. Pyle gives the following provisional conclusions :—

1. Oxygen contents are generally low. The low pressure of the atmosphere (720 to 726 mms of mercury) and the high temperatures have to be taken into account and future results might be expressed in terms of oxygen deficiency (if any).
2. Oxygen contents at the surface are higher in still waters than in the main current which is contrary to expectations based on conditions in temperate regions.
3. Patchy and big fluctuations in oxygen content occur in the fringing vegetation.
4. Vegetation-locked (or almost locked) lagoons show clear, daily rhythms of oxygen content.

These conditions probably influence biological phenomena and should be investigated in detail. Although fish are generally rather resistant to oxygen deficiency, a coincidence of various factors including this may be a cause of fish migration and/or death.

SECTION III

THE WORK OF THE FISHERIES OFFICER.

After the departure of the Gordon Memorial College team, Mr. R. Taylor, Fisheries Officer, continued working in the same area. In February 1949 it was decided at a meeting of the Fisheries Standing Committee of the Department of Economics and Trade that he should be temporarily attached to the Jonglei Investigation Team and the following programme of work was drawn up :—

- (a) Experiments in the use of different forms of net in (i) deep waters, (ii) shallow waters, and (iii) moving waters e.g. in the main channel of the Nile.
- (b) Experiments in the production of (i) fish meal, (ii) fish oils, and (iii) cured fish (smoked, sun-dried and salted).
- (c) Training of Nilotic staff for future experimental work of this nature
- (d) Observations on present native fisheries (i) commercial (e.g. by northern Sudanese) and (ii) subsistence (e.g. by Nilotics).

(e) General observations on distribution, habits (migration and breeding) of fishes in this reach.

Successful work was carried out on all these topics between that date and May.

EXPERIMENTS ON THE USE OF DIFFERENT KINDS OF NETS.

The nets used were imported especially from Messrs. Gundry of Bridport. Detailed specifications together with records of the numbers, kinds and sizes of fish caught in them are given in the unpublished reports: the following is a brief summary of the points of main interest :—

Small Gill Net. Four inch mesh ; 55 meshes deep ; fitted complete to fish 40 yards long ; made of 16-ply reverse twist cotton. The size of the mesh was chosen after consultation with Omdurman fishermen as suitable for *kawwara* (*Alestes*).

Large Gill Net : Six inch mesh : 50 meshes deep ; fitted complete to fish 40 yards long ; made of 16-ply reverse twist cotton. This net was selected as of suitable mesh for *bulti* (*Tilapia*).

Small Trammel : Inner net of two inch mesh made of eighteen-ply cotton ; walling of twelve inch diamond mesh made of 12/18 reverse cotton ; fitted complete to fish four feet deep by sixty yards long.

Large Trammel. Inner net of five inch mesh made of 12-ply cotton ; walling of twenty-four inch diamond mesh, made of 12/18 reverse cotton ; fitted complete to fish four feet deep by sixty yards long.

Seine : To fish eight feet deep by thirty-two yards long. Centre net, three inch mesh made of 24 thread cotton ; arms and quarters of three and a half inch mesh made of 18 thread cotton.

All the nets were treated with cuprinol.

During January catches were poor but the following seven species of fish occurred in sufficient numbers to give an indication of the relative merits of the nets :—

FISH	Number Caught	Lengths in mm.	Best Net	Worst Net
<i>Synodontis membranaceus</i>	127	210-400	Large trammel	Small trammel
" <i>clarias</i>	55	170-400	" "	" "
" <i>schall</i>	24	180-390	" "	" "
<i>Mormyrus caschive</i>	39	350-740	" "	" "
<i>Citharinus</i> spp.	74	67-555	" "	small gill
<i>Hydrocyon</i> spp.	57	120-520	small gill	large trammel
<i>Distichodus</i> spp.	25	135-470	small trammel	small gill

Alests spp. were caught in casting nets but not in the fixed nets.

The large trammel thus proved to be the most suitable net in those waters and at that time of the year. A proper comparison of the trammels with the gill nets is however impossible in view of their very different depths.

During this period the gill nets in particular suffered very extensive damage every night possibly from Nile perch which had been caught and broken away. Later it was found that these nets, as supplied by the makers, were too heavily weighted for use under these conditions and consequently not sufficiently pliable. By reducing the weights, it was found that the performance of the nets was improved and the damage considerably lessened.

In March and April fish became much more abundant and the seine, which had been abandoned as useless in January, was used with considerable success, as many as 75 to 100 Tilapias per haul being taken under favourable conditions. Detailed records were kept of the sizes of the commoner kinds of fish landed at Khor Atar during these months as such records are needed to provide a basis for future comparisons such as will be required for the purpose of detecting indications of deterioration due either to the changing conditions or to over-fishing. It may be noted here that the aim of scientific control is to regulate the intensity of fishing so as to permit the maximum annual off-take of fish without depleting the stock. Under these conditions few, if any, fish will survive to a ripe old age and the exceptionally big specimens will disappear. This is not a bad thing. The important things are the numbers and average sizes of the fish and with proper control these should not merely be maintained but may even be improved.

It was not possible during this period to continue to record the catches of each net separately, but systematic tests of the relative performances of different nets under different conditions will be required before any serious extension of net fishing is attempted. The following points have, however, emerged :—

Gill Nets. The size of mesh of the "large gill net" seems just about ideal for commercial use in this area. No very small fish were caught and there were always representative catches of different species. The "small gill net" was much less successful.

Trammels. The success of the "large trammel" has already been mentioned. The "small trammel" was much less successful and despite many hours of use the total landings were small. It should be noted that the depth of the trammels was only four feet compared with the 12 feet or so of the gill nets. It is probable that the small trammel would be a very

useful net to place across the mouths of khors as the levels change. The small mesh nets were selected as probably suitable for *Alestes*, but under the prevailing conditions were not successful for this purpose.

Fishing in the main stream of the river requires considerable skill and could not be undertaken until the fishermen were well trained. It proved, however, to be unproductive, mainly because floating vegetation continually fouled the nets.

It may be concluded that although further experiments are desirable to find just the best types of nets to be used under different conditions, there is no doubt that net fishing under the conditions that will prevail in the final stages of the Project will be practicable and will present no particular difficulties.

EXPERIMENTS ON METHODS OF PRESERVING FISH

(i) Dried Fish Meal.

Fish meal is already made and greatly appreciated as a food in many parts of Tropical Africa including the southern Sudan. In other countries it is also used extensively as a fertiliser and as a constituent of cattle feeds etc. Its production in this area is therefore a matter which merits close attention.

A small-scale experiment in producing dried fish meal was carried out at Khor Atar and also at Khor Pic.

The drier consisted of an old thirty-three gallon drum with a hole fourteen inches in diameter cut into the base and the top removed. Four L-shaped brackets were bolted to the side six inches above this hole and a baffle plate twenty-four inches in diameter lowered onto them.

The drum was raised above the ground sufficiently to provide a space for a fire underneath and then mudded to a thickness of four inches to act as insulation. A lid made from an old petrol can was fitted.

Four trays made of expanding metal were found to be a failure so four further trays were made by the Public Works Department blacksmith at Atar from galvanised iron with $\frac{5}{8}$ holes punched into the base to allow the smoke and hot air to pass through the fish.

The normal dehydration procedure used commercially elsewhere is as follows :—

- (a) Wash, behead and fillet the fish.
- (b) Mince the fillet, the mincer having plates with $\frac{5}{16}$ to $\frac{1}{2}$ in hole.
- (c) Cook in retorts under steam pressure for thirty minutes at twenty one pounds per square inch,

- (d) Remove from cooker, remince and place on trays.
- (e) Place the trays in a tunnel where a current of warm air is passed over them at controlled speed, temperature and humidity.

Time taken to dry : about four hours.

As practically none of the facilities needed for this were present, the procedure adopted at first was :—

- (a) Wash fish, remove heads, tails and gut.
- (b) Boil (in tins) until flesh comes free from bones.
- (c) Remove flesh from bones and skin.
- (d) Pass through mincer. (Only a small domestic mincer with quarter inch holes was available).
- (e) Place in trays and dry in the drum.
- (f) Remince.
- (g) Replace in trays and dry right out.

This method was abandoned as labour costs were much too high and also constant supervision was required, so the number of operations was cut down to the following :—

- (a) Wash, gut and remove heads.
- (b) Place in trays and cook slightly until the large bones and skin can be removed with ease.
- (c) Mince and spread on the ground under a fly net for 24 hours (sun-light).
- (d) Pound into a fine powder.

An alternative method of drying which is probably more suitable for the local fisherman to carry out on his own without supervision is as follows :—

- (a) Wash and gut fish.
- (b) Boil until flesh can be removed from the bones and skin.
- (c) Place the fish flesh on the ground in sun, cover with fly net.

Samples of fish meal produced by these methods are to be analysed.

(ii) Fish Oil.

Fish oil has been produced in very small quantities during these preliminary experiments from fish guts and from any loose fat found inside the fish, also from adipose fins of the *Synodontis*. No experiments were carried out in extracting all the oil from the whole fish. If a trade in fried or smoked fish is built up, a certain amount of oil could be produced from the waste matter.

Samples will be forwarded in due course for an analyst's report.

(iii) Sun-Dried Fish (unsalted).

Repeated attempts to produce sun-dried fish proved unsuccessful as all samples soon became fly-blown. The odour, while inoffensive to the

native consumer, is fatal in that it indicates bacterial decomposition which, even if checked temporarily, is non-reversible and on change of climate, rough handling in transit etc. will restart with increased rapidity. It might be possible to produce sun-dried fish by using mosquito wire frames to dry the fish, but even this would be risky with cheap labour.

(iv) Smoked Fish.

It is regretted that a smoking shed which was designed in accordance with Graham's description (7) was not available until this report was due, so almost no time could be spent on smoking fish. As will be seen later in this report, Tilapia can be landed in large numbers and such fish is exported from East Africa to the Congo (Native-smoked) in large and profitable quantities. Without doubt, if a market can be found for such a product in or outside the Sudan, a good quality smoked Tilapia could be produced during the months in which this fish can be caught in these areas.

Different fuels vary considerably in their suitability for smoking fish, resinous woods (such as Acacias) being as a rule unsuitable for the purpose. Tests will have to be carried out to find which of the locally available sources of smoke can best be used.

(v) Sun-Dried Fish (salted)

A number of experiments were carried out to produce a good quality sun-dried, salted fish, but numerous difficulties were encountered. Fish caught during the night were found to be bad by the time the last half were being gutted, so fishing hours had to be changed to early morning and girls employed to wash, gut and salt the fish. These local girls soon became quite proficient at this work and were much faster than the men. The method finally used was as follows :—

- (a) Gut the fish after cutting from the vent to the shoulder girdle, without breaking the gall bladder.
- (b) Decapitate with a knife passing between the bones of the shoulder girdle, at the back of the gills.
- (c) Well wash in running water.
- (d) Place in a strong solution of brine for up to one hour.
- (d) Remove from brine and rub a small quantity of salt well into the tissue ; this is most important.
- (f) Hang up in the sun to dry. This generally takes up to four days for Tilapia and from seven to eight days for Heterotis.

A solution made up as recommended by Graham (7) i.e. five quarts of salt and one dessert spoonful of saltpetre to 10 gallons of water, was tried and the result was in no way superior to the above,

During the periods in which sun-dried salted fish was being made at Atar, a total number of 22 days, four hundred and twenty nine Heterotis and two thousand three hundred and nine Tilapia were salted and dried, giving a total dried weight of 1374 rotls.

(vi) Experiments on loss of weight during sun-drying and salting.

950 Tilapias treated in this way gave 250 rotls of dried, salted product. The weight of the fresh fish could not be determined as no scales were available for weighing fish in bulk. Nevertheless the weight can be estimated with considerable accuracy from the average length of the fish (namely 280 mms.) and the "condition" factor (*i.e.* 100 times the ratio of the weight of the fish in grammes to the cube of the length in cms.) which, for full-grown Tilapia, is found to be 3.5 (the length was measured to the base of the caudal fin. Some workers prefer to measure to the tip of this fin, in which case the value of the "condition factor" is considerably lower).

$$3.5 \times 28$$

The average weight per fish was therefore :- $\frac{\quad}{100}$ grammes

100

or. 7683 kilos or 1.71 rotls.

Consequently 950 x 1.71 rotls of fresh fish were required to produce 250 rotls of dried fish. That is, 6.5 rotls of fresh fish are required for every rttl of the final product.

(vii) Cost of Production of sun-dried salted fish.

The following are the costs of a 22-day experiment carried out at Khor Atar in March and April :—

Labour :

			LE. m/ms.	
4 fishermen at	..	..	LE. 1.500 m/ms.=	6.000 per month
2 labourers at	..	..	LE. 1.000 m/ms.=	2.000 " "
10 girls at	..	..	LE. 0.300 m/ms.=	3.000 " "
1 chargehand at	..	..	LE. 5.000 m/ms.=	5.000 " "
Total per month				—LE. 16.000
				LE. m/ms.
Netts :—	..	..	..	11.762
	..	..	..	3.000
(a suitable imported net would cost about LE. 30 and would last for at least one season.)				

		LE. m/ms.
<i>Boats</i> :— <i>Estimated depreciation</i>	.. .. .	1.000
(A single boat was used. Such a boat would cost about LE. 15 and should last with care for at least one season.)		
<i>Salt</i> : two and one half sacks	.. .. .	2.250
<i>Fish Knives etc.</i>	.. .. .	2.250
		<hr/>
Total	.. .. .	18.112

The total weight of sun-dried salted fish produced during this experiment was 1,376 rotls and the cost per rotl was therefore 13 m/ms.

The market value of the dried fish at current Malakal (northern) prices would have been :—

		LE. m/ms.
2309 Tilapia at 20 m/ms. each	.. .. .	46.180
429 Heterotis at 70 m/ms. each	.. .. .	30.030
		<hr/>
Total	.. .. .	LE. 76.210 m/ms.

It is clear that considerable profit could be made on this basis even after allowing for transport charges. With a suitable net the total landings would be much larger and as these extra landings could be handled by the same amount of labour, the production costs would be reduced.

TRAINING OF NILOTIC STAFF.

The work reported here was carried out entirely with the aid of local labour completely inexperienced in this sort of thing. Such labour difficulties as were experienced were of the type normally encountered in such circumstances. A good proportion of the men employed showed good aptitudes in handling the boats and nets. They were ready to learn new methods and there is no reason to doubt their ability to become competent independent fishermen or their willingness to do so given suitable inducements.

OBSERVATIONS ON EXISTING LOCAL FISHERIES.

The following information has been obtained from local fishermen (Shilluk) and, except where stated, has not been confirmed from official records.

Northern Sudanese fishermen were first known to fish these waters in about 1925, when one boat came south and fished for *fasikh* and fresh fish for sale to the local population. At present two merchants are concerned with the trade in Malakal, and they seem to be in partnership, one

remaining in Malakal and the other travelling round the various areas in which their boats are working, or travelling backwards and forwards to the north in the large commercial boat which they own.

Twenty-four northern Sudanese fishermen are employed by these two merchants working four men per boat, wages being paid on a share basis. At the close of the season after all expenses have been paid, i.e. nets, boats, sails, etc. the remaining profit is divided into seven equal shares, each fisherman receiving one share in his boat's profit and the merchant three shares as the nets, etc. are his. Each boat is treated separately.

The main fishing grounds used by these boats are :— Khor Acambany, Khor Arami, Khor Atar and Khor Pic. The fish caught in these waters are sold in Malakal market at the following prices (1949) :—

Aigle 40 m/ms. per oke.

Bayada 40 m/ms. „ „

The remaining species are sold at any price which they will fetch. Fish purchased by a native in April were :—

Tilapia .. 1.70 rotls (= .762 kilo) 20 m/ms.

Mormyrus .. 1.52 „ (= .680 „) 30 m/ms.

There is no waste from the larger fish which are sold in pieces. Large fish heads complete with backbone are sold to the poorer natives at 20 m/ms each.

Fish for the dried fish trade are caught in the main river in and at Obai, Dhengo and Awarajwok. The merchants state that this trade is very small as only 600 tins were produced in 1948. It is impossible at present to check this figure as the large commercial boat which they own carries the fish to the north direct and products are not consigned through the Sudan Railways.

Figures for this year given by merchants are as follows :—

Obai 400 tins

Dhengo 170 tins

AwaraJwok 70 tins

The amount of fish sold by these merchants to the local Shilluk at the river bank and at places of landing is not known, but the large boat owned by these merchants seems to make a fair number of voyages to the north with grain.

The infiltration of the northern Sudanese fishermen into these waters has been opposed by the Shilluk and now a few Shilluk wish to fish the khors themselves, but are unable to purchase nets or net making materials at reasonable prices within their means. This has, in fact, always been a problem and indicates, perhaps, that the development of fisheries on a

large commercial scale for export in this particular reach of the Nile will not be possible without seriously affecting the existing subsistence economy of the inhabitants and also sales of fresh fish in the Malakal market. This is, of course, not an aspect with which the Jonglei Investigation is concerned but is worth while noting here.

GENERAL OBSERVATIONS ON PISH.

Tilapia nilotica. (Arabic : *Bulti* or *Khadem mire* : Shilluk : *Owedho*).

In striking contrast to the extreme scarcity of this fish in January (see above), large numbers were present in Khor Atar in March and April when catches of 75 to 100 per haul were taken with the 120 yard long seine. When the Khor was revisited on 15th May, three hauls with the same net yielded only 14 Tilapias.

This early disappearance of the fish may have been due to an early temporary rise of the water. The camping site used in March and April was completely under water on 1st May and again dry on the 15th. The Shilluk at Atar all agree that when the water starts to rise the *bulti* leave that part of the khor which we were fishing but where they go to is not known.

Within the khor itself the distribution of fish is very uneven. They appear to congregate in the deep water on the south side where the water is about a fathom deep with a deep fringe of sudd and vegetation and to avoid the shallower north shore where there is no vegetation or shade. At the time when the large catches mentioned above were being made at the former locality, only six of the fish were caught at a spot a few hundred yards away in a section of the khor where the bottom was sandy.

Considerable numbers of the fish at this time were carrying young in their mouths, but most expelled them at the last minute before coming out of the water in the net. Fry were caught at the following places :

Place	Date	Length	Numbers
Khor Atar	March-April ..	10 to 25 mms	abundant
Atar, main river ..	March-April ..	10 to 13 ..	very few
	May		
Malakal, Khors.. ..	April-May	18 to 20 ..	few
Malakal main river ..	May	10 to 15 ..	very few
Kilo 50	18th May	15 to 20 ..	common.

A second species of *Tilapia* was taken in very small numbers, not more than 10 being landed during the whole of the period at Atar. This fish is

characterized by slightly smaller size, relatively smaller mouth and more pronounced pectoral fin filament. It is probably *T. galilaea*.

Heterotis niloticus : (Arabic : *Noc*. Shilluk : *Olak*).

Like *Tilapia* this was very scarce in January when only two were caught. At Khor Atar the numbers rose to a maximum in April and by May again only a few were taken in the trial hauls. No nests or fry were seen and according to the local Shilluk it breeds during July and August.

Mormyrus caschive : (Arabic : *Khashm el banat*. Shilluk : *Adolakok*).

The distribution of this fish is very different from that of the previous two species. In Lake No considerable numbers were taken at all times, including January, while a little later an average of 12 per night were taken in the gill nets near the old factory site. Few were taken east of this ; in fact during the January fishing two specimens from Khor Berboi were the only ones seen along the whole of this reach of the river. A fair number started to appear in the Malakal market at the end of May, suggesting a movement down-stream.

Citharinus citharus. (Arabic : *Betkoya*. Shilluk : *Othago*).

During January this was the most abundant of the better quality fish, large specimens being caught consistently at all the stations. Very few, however, were caught at Atar during March and April and these were all small fry of an average length about 90 mms. Local information has it that they are sold in large numbers in the Malakal market in the period October to January.

Clarias anguillaris and *C. lazera* (Arabic : *Garmut*. Shilluk see below).

The Shilluk have two names for *Clarias*, *Cogo cido* being apparently used for *C. anguillaris* and *Cogo yap* for *C. lazera*. The largest specimen (1 metre 48 cms. long) was seen in Malakal market in June. In almost all of these fish large numbers of parasites are present both in the intestines and in the flesh including a small Trematode somewhat similar in general appearance to *Clonorchis sinensis*.

Polypterus endlicheri (Arabic : *Dabib el hut*, or *Abshir*).

A few of these fish were taken in Khor Pic and Khor Atar but none in Lake No or near Malakal. The sizes ranged from 230 to 420 mms. The flesh is quite good to eat but, owing to the extreme hardness of the bony scales, the only way to remove the guts is to cook the fish first.

Lates niloticus : (Nile Perch. Arabic : *Aigle* ; Shilluk : *Gur*).

A separate report on this and certain other fish will be presented later.

SECTION IV.

REPORT ON ANALYSIS OF A SAMPLE OF FISH - MEAL FROM AWEIL.

The following is the report on a sample (one pound weight) kindly supplied by the District Commissioner, Aweil and sent to England for analysis (by D.W. Kent and A.J. Jones, Analytical Chemists, London):

Moisture	6.75%
Protein (Nitrogen x 6.25) ..	54.37%
Oil	23.30%
Ash (Mineral matter)	12.40%
Fibre	0.04%
Carbohydrates (by difference) ..	3.14%
	100.00%
Calcium content calculated as Ca	3.00%
Iron content calculated as Fe ..	0.35%
Vitamin B1	0.03 ug/g
Riboflavin	3.5 "
Nicotinic acid	44.5 "
Vitamin A	The product had a blue value of only 0.1, which is negligible. The product is therefore essentially devoid of Vitamin A.

No mention was made of the actual species of fish from which this sample was made, but the following description of local methods of production has been forwarded to us by Mr. D. Fyfe, District Commissioner, Aweil :—

Aweil does not hold a monopoly of this product. I am informed that the people of Lakes District, Western District and the Rizeigat also make *mandeci* (fish meal or paste).

Any species of fish may be used, normally small ones of less than six inches, but large ones may be cut up for the purpose. In December and January the small fish are caught in traps when returning to the river with the receding floods. Larger fish are caught when the river fishing opens in March. *Mandeci* from small fish is preferred. When larger fish are used, the paste does not keep very well. Small *Khashm el Banat* (*Mormyrus caschive*) are said to make the best *mandeci*, as they are full of fat. The small fish are not cleaned.

The whole fish are dried in the sun and are then pounded. In Aweil the container is a long grass rope about one inch in diameter. The end is twisted to form a small cone and the fish is pounded into it. When the little cone is filled another turn is made of the grass rope thus increasing the height of the cone and more fish is pounded in. Further turns are made as the container is filled and finally the end is coiled round on the base of the cone and beaten into the pounded fish. The grass rope sticks into the mass as a result of the pounding action. A loop for carrying is attached. I am informed that in the Lakes District the fish are pounded in a large *fundug* (mortar), strips of grass string being placed in the mortar first. When the mortar is filled with a solid mass of *mandeci*, the free ends of the grass strings are tied together and the shape, mould or head is removed from the mortar.

A very important point to note is that the finished product must be very thoroughly smeared with *kombo*. *Kombo* is a native salt made by straining water through the ashes of burned *doleib* palm flowers, or the burned branch of the female *doleib* when the fruit has fallen. Other vegetable matter may be used. The *kombo* used is in liquid form and is rubbed into the outside of the *mandeci* to preserve the paste from weevils and maggots.

In Western District the fish is dried very thoroughly and pounded into a powder. This powder is then mixed in the sticky juice of a creeping plant commonly used for rope in native buildings and thatching. I regret I do not know its correct name but it is known here as *lia*(10). A section of the stem is cut and squeezed in water to extract the juice. This juice is mixed with the fish powder and the resulting sticky mess is then squeezed onto a plate of crisscross bamboo strips into the shape of a sugar loaf. It is usual to use *kombo* : perhaps the juice of the creeper has a preservative value.

It is said that the *mandeci* can keep for as much as three years, but normally it is not kept for more than one and often is eaten inside six

months. The heads should be placed in the sun occasionally and with the Dinka *mandeci*, the *kombo* should be renewed at intervals.

GLOSSARY.

- Doleib. The large fan palm, *Borassus aethiopicum*.
 Fasikh. Small fish, mainly *Alestes* and young *Hydrocyon*, roughly preserved by salting and packed in large cans. Considerable quantities are exported annually to Egypt.
 Khor. A water channel. In this region the term is applied to almost any kind of backwater or tributary including those which dry out annually.
 Sudd. "From Arabic 'Sadd' ; a barrier, locally the vast bog or water prairie between Lake No and Bor" (Tothill). The term is applied also to the vegetation which makes up the floating masses of which the barriers that sometimes block the river are formed.
 Toich. "A very useful Dinka word that should be admitted to the English language ; used to describe the annually flooded grazing lands along the water-courses draining into the sudd. Toichs are a feature of Equatoria Province. Every toich has a 'thalweg.'" (Tothill).
 Rotl. 450 grammes.
 Oke 1250 grammes.

REFERENCES.

1. The detailed reports on which this account is based are preserved in file number J/130 of the Jonglei Investigations and in the office of the Department of Economics and Trade, Khartoum.
2. (a) Interim and Annual Reports of the Jonglei Investigation Team. Published by the Sudan Government, Khartoum.
 (b) "A short account of the Equatorial Nile Project and its effects in the Sudan." *Sudan Notes and Records*, (to appear shortly).
3. Baker, Sir S. W. 1866 : "The Albert N'Yanza."
4. Beam, W. "Report of the Chemical Section." Wellcome Research Laboratories, Khartoum, Second Report, 1906.
5. Bloss, J. F. E. 1945. "The Sudanese Angler." *Sudan Notes and Records*, vol. 26, pp. 257-281.
6. Girgis, Sabet. 1948. "A list of common fish from the Upper Nile, with their Shilluk, Dinka and Nuer names." *Sudan Notes and Records*, vol. 29, pp. 2-7.
7. Graham, M. 1929. "The Victoria Nyanza and its fisheries." London ; Crown Agents for the Colonies.
8. Sandon, H. 1950. "An illustrated guide to the freshwater fishes of the Sudan." *Sudan Notes and Records*, special publication.

9. Stubbs, J. M. 1949. "Freshwater fisheries in the Northern Bahr el Ghazal." *Sudan Notes and Records*, vol. 30, pp. 245-251.
10. 'According to Mr. T. R. H. Owen, Governor, Bahr el Ghazal Province, this is probably *Salzla* (*Cissus quadrangularis* or *C. populerea*.)

The following technical publications are based mainly on work done during the two Gordon Memorial College expeditions. Others are in course of preparation.

Girgis, S. See number 6 above.

Rzoska, J. 1949. "Cordylophora of the Upper White Nile." *Annals and Magazine of Natural History*, ser. 12, vol. 2, pp. 558-560.

Sandon, H. 1949. "Opalinids from Nile Fish." *Nature*, vol. 164, pp. 410-411.

THE HISTORY OF DARFUR 1200-1700 A.D.**By A. J. Arkell**

'Any writer who attempts to recall from obscurity and oblivion the past ages of an illiterate nation and to lay before the public even the most elementary sketch of its history will probably have to contend against the strong prejudices of numerous critics, who are, accustomed to refuse belief to whatever is incapable of bearing the strictest enquiry'.

Heinrich Barth. Travels II. p. 253

CONTENTS.**Chapter****Part I.**

1. Introduction.
2. The present state of our knowledge of the early history of Darfur.
3. The Fur.
4. The Daju.

Part II.

5. The Tungur.
6. The evidence of the brands used by non-Arab tribes in Darfur.
7. The early Sultans were Divine Kings.

Part III.

8. The influence of Bornu.

Part IV.

9. The contribution of archaeology.
10. Reconstruction of the medieval history of Darfur.

PART 1

CHAPTER 1. INTRODUCTION

Darfur, 'the land of the Fur', to-day forms the westernmost province of the Anglo-Egyptian Sudan. It is bounded on the north by the Libyan desert, on the west by Wadai, on the south (approximately) by the Bahr el Arab (a seasonal river that marks the beginning of the forest country), and on the east by Kordofan. Its shape is a rough rectangle about 300 miles in breadth from west to east, and 400 miles from north to south.

Almost exactly in the centre lies the great mountain range of Jebel Marra, which culminates abruptly at its southern end in its highest peak, over 10,000 feet above sea level. North of Jebel Marra stretches for some 75 miles a mass of tangled hills which only comes to an end some 25 miles north of Kutum. North of this lie the plains of Dar Zaghawa, dotted with occasional hills that further to the northwest link the mountains of Tibesti into one system with Jebel Marra. West and south of Jebel Marra is another mass of low broken hills.

In the east of Darfur the sand of the Libyan desert has drifted down to below the 12th parallel, forming in its course *El Goz* (*the sandhill*), the natural boundary of the country hereabouts, although at times the dominion of Darfur has spread far eastward into Kordofan.

South of the 12th parallel the chief feature is a plain of poor soil intersected by water-courses running south and east from Jebel Marra until they join the Bahr el Arab, through country becoming ever more thickly covered with small trees.

Crossing Darfur just north of the main Jebel Marra range, and through the Kaura Pass, runs the great east to west road which crosses Africa, and to-day brings from the Lake Chad area and further west a stream of pilgrims and persons bent on making money in the more civilized areas on the Nile.

To-day the Fur form a large and fairly compact block of negroid people stretching from Kutum southwest, and the area that they occupy roughly coincides with the hilly country already mentioned. They come under various administrative divisions, and they are broken up into numerous different communities. What really unites them is a common language.

In the extreme northwest of Darfur is a large area sparsely inhabited by semi-nomadic peoples who call themselves Zaghawa, speak a language of the Teda-Kanuri group, and say that some of their number are of Bornu, and others of Bedayat origin. In the north-east corner, inhabiting their own isolated hill are the Meidob, a people who speak a language

of the Nubian family, and are probably related by blood to the Zaghawa, the inhabitants of Tibesti, and to the Beja of the eastern Sudan. South of them are a large number of Berti, a negroid people whose peculiar language is almost extinct.

On the east of Jebel Marra and south of El Fasher live the Birgid, another more or less negroid people of mixed origin, with a language akin to that of the Meidob; according to tradition the Birgid not so long ago inhabited N.W. Kordofan.

In a group of hills just northeast of Nyala are a small colony of negroid people calling themselves Daju.

Scattered between Kutum and Jebel Hereiz, some 30 miles south of El Fasher, are several small colonies of Tungur.

In the north of Darfur, roughly bounded by the 13th and 15th parallels, and living a nomadic life, are small bodies of camel-owning Arabs, many sections of which are related to the more numerous cow-owning Arabs (*Baggara*), who live between the 12th parallel and the Bahr el Arab on the southern plains.

Darfur from the 17th to 19th century was one of a string of kingdoms which stretched across Africa between the desert and the tropical forest. Travelling westwards from Darfur one journeyed consecutively through the kingdoms of Wadai, Bagirmi, Bornu (Kanem), the Hausa states, Melle, and so on to the Atlantic.

East of Darfur sovereignty over the steppe country now known as Kordofan was disputed between the sultan of Darfur and the Fung sultan whose capital was at Sennar on the Blue Nile. The historic dynasty of the Fur really came to an end in 1875 when sultan Ibrahim was killed by Zubeir Pasha at Menawashei. The earliest Fur sultan who can be said at present to be really historical is Suliman Solong, (whose date as given by Nachtigal and hitherto accepted is 1596 to 1637 A.D.). Between Suliman Solong and Ibrahim (d. 1875) ruled nine sultans, who are all historical.¹

According to local tradition Darfur was ruled by the Tungur before the Fur, and by the Daju before the Tungur. It is not known at present who the Daju or the Tungur were, or what period each dynasty covers. There are no written records that will give a direct answer to these questions; and in this study an attempt will be made to form from such indirect evidence as is available a reasonable hypothesis as to the course of history in Darfur during the centuries under review.

¹ See *Sudan Notes and Records* Vol. XXXI Part 2.—Ed.

CHAPTER II.

THE PRESENT STATE OF OUR KNOWLEDGE OF THE EARLY HISTORY OF DARFUR.

The earliest visitor to Darfur who has left any writings on the early history of that country, is the Englishman, W. G. Browne, who reached Darfur by the desert route from Asiut in July 1793, and who remained in the country until March 1796. His references to early history are disappointingly slight in view of the fact that he remained in the country for nearly three years and made some enquiries. He was, however, not in a position in which enquiry would be easy, for he was an object of suspicion to those in authority, and was confined during the whole of his stay to the towns of Kobbe and El Fasher. He found that no written documents existed in Darfur, and that those of whom he enquired were often at variance both with regard to the genealogy and succession of their monarchs ; it was, however, commonly said that it was during the reign of Suliman Solong that Islam began to prevail in the country. He thought that the Fur sultans were in origin 'probably Moors driven from the north by the Arabs', and that Suliman belonged to the 'Dajeou race, which swayed the sceptre long before that of Fur became powerful'. He does not mention the Tungur whom he probably confused with the Daju, for he says that the Daju were said to have come from the north, 'having been expelled from that part of Africa, now nominally at least under the dominion of Tunis'¹.

In 1803, some seven years after Browne's departure, Darfur was visited by the Arab savant Mohammed 'Omar al Tunisi, who was only 14 years old at the time of his arrival, but who remained nearly 8 years in the country and had considerable facilities for travelling around and getting to know Darfur well. He eventually returned home to Tunis via Wadai. His father and uncle were merchants trading between Cairo, Sennar Darfur and Wadai, and they must have possessed a considerable knowledge of the country, on which the young traveller no doubt drew to supplement his own observations. His books, the *Voyage au Darfour* and *Voyage au Ouaday*² written in Arabic in Cairo some 20 years after his departure from Darfur at the instigation of Dr. Perron, who translated them into

Travels in Africa, Egypt and Syria, London 1799, pp. 280 & 306. (hereinafter cited as 'Travels').

² Hereinafter cited as *Darfur* and *Ouaday* respectively.

French, display a considerable knowledge of the country, although it is hardly surprising that there are occasionally to be detected in them lapses of memory as to detail ; and he clearly lacked to a great extent the critical faculty that one would expect in an educated European. Tunisi, who also noted the absence of any written historical records in Darfur¹, merely stated that there was formerly a sultan called Solong Suliman, first ancestor of the Darfur sultans properly so-called, and that he had a brother called Mousabba, who split Kordofan off from the kingdom of Darfur.² According to 'les gens instruits du Darfur', Solong (Saloun) had reigned nearly two centuries before (i.e. c. 1600 A.D.). In Wadai there was a story which made Seleih, the founder of the reigning dynasty of Wadai, a brother of Solong and Mousabba and said they were all Fezara Arabs³. Tunisi concluded 'Au reste, quelque opinion que l'on adopte sur l'origine des Sultans actuels du Ouaday, du Darfur et du Kordofal, il est certain quel'établissement de ces trois 'États est d'une époque assez rapprochée et ne dépasse pas deux cent ans'.⁴ He was not interested in the dynasties that preceded those whose representatives he found on the throne, and only mentioned incidentally the claim of the Tungur to have been rulers of Darfur before the Fur sultans. He recorded that⁵ a number of petty states formed integral parts of Darfur — Zaghawa, Meidob, Berti in the north ; Birgid, Tungur, Burgu, Mima in the centre and east ; and Daju, Beigo and Feroqe in the south ; and that each had a governor, who sometimes held the title of sultan, although all were under the sultan of Darfur. Tunisi clearly did not look on the Tungur as of Arab origin. He grouped them with the Birgid,⁶ and wrote 'les Birgids sont traitres, voleurs, rapaces à l'excès, sans crainte de Dieu ni du Prophète. Les Toundjour, au contraire, ont une certaine dose de religion et d'intelligence, ce qui les maintient dans les limites d'une conduite plus modérée.'

He had little to say of the Daju except that in Darfur they had a 'sultan secondaire'⁷ ; that with the Mima, Gorān, and two other tribes, they formed the five great peoples or primitive tribes of Wadai,⁵ and that they lived in the south, and were mostly of a very black colour, and still savage in character.⁸

¹ *Ouaday*, p. 73.

³ *Ouaday*, p. 74.

⁵ *Darfur*, p. 128.

⁷ *Ibid.* p. 138.

² *Darfur*, p. 66.

⁴ *Ouaday*, p. 74.

⁶ *Darfur*, pp. 133 and 136.

⁸ *Ibid.* pp. 69/70.

Tunisi heard nothing of the Tungur having once ruled in Wadai, although he discussed ¹ the origin of the dynasty of Wadai with the old men of the country, when he was given two contradictory accounts, one that the founder belonged to the local tribe of Ab Senoun, and another (supported by the royal seal) that he was an Abbasid who introduced Islam to Ab Senoun, and so to all Wadai, where he was eventually accepted as sultan.

The well known traveller, Heinrich Barth, who between 1849 and 1855 travelled from Tripoli to Lake Chad, and explored the Sudan between Timbuctu and Bagirmi, did not reach Darfur, but while in Bornu and Bagirmi he collected such information as he could about the history of Wadai and Darfur, as well as of the countries that he visited ; and on the whole showed sound judgement in the conclusions that he drew from his observations. With regard to Darfur, which he never saw, he cannot be expected always to be right, but his references to it are worth consideration.

He noted that 'for the eastern part of Negroland (which comprises the countries of Bagirmi, Waday or Dar Sulay, and Dar-Fur) no such documents have been found' (as for Bornu), 'and besides the information to be gathered from the natives, only a few detached and obscure statements have been handed down to us by the Arab writers of the middle ages'. ² He did not know all the Arab writers, however, and was misled by the erroneous reading 'Bajo' for 'Taju' in Abu al Feda (see below p. 64) and he also had little justification for saying that the Daju originated 'in the mountainous district of Fazoglo' on the upper Blue Nile, so that although he correctly (as against Nachtigal) stated that the Zaghawa belong to the great Teda stock, he misunderstood the reference of Ibn Said and others to the Daju. He concluded quite naturally from Leo Africanus that the empire of the Bulala extended 'as far as the interior of Dar Fur', while we shall see that there is no evidence for this in Darfur.

The information collected by Barth about the Tungur added considerably to what had been said about them by Tunisi. He believed that they had entered Darfur from Dongola, conquering the Daju and gradually spreading over Wadai and part of Bagirmi. Local tradition in Wadai said their rule there had lasted 99 years and had then been overthrown in A.D. 1620 by 'Abd al Karim, the founder of the Muslim empire. 'Abd al

¹ Ibid pp. 69/70.

² *Travels in Central Africa*. London 1857 (2nd edition). Vol. III. 425ff. (Hereinafter cited as '*Travels*').

Karim had previously served the Tungur sultan as governor of the eastern province, where he had felt the mighty hand of Suliman Solong, the first Muslim king of Darfur,¹ for Kuru, his third predecessor, had vanquished the Tungur, and founded the pagan Fur kingdom some time before the general introduction of Islam into those countries.

In 1874, the intrepid German explorer, Dr. Gustav Nachtigal, spent six months in El Fasher, collecting and collating, with some help from sultan Ibrahim, all the written and verbal evidence as to the past history of Darfur that he could find. He was nearing the end of a magnificent journey, from Tripoli to Lake Chad, and thence eastward through Bagirmi, Wadai, and Darfur to the Nile, which lasted six years, and during which he endeavoured to clarify the early history of the various countries through which he travelled. Nachtigal's contribution is of particular value in view of the opportunity he had to carry out his investigations before the historical continuity was broken by the Egyptian occupation. This was followed by the period of Mahdist supremacy, when between 1885 and 1898 the dervishes sought out and destroyed all writings other than the Quran and the *Ratib* of the Mahdi, lest there might come to light a document disproving the claim of the Khalifa 'Abdallahi to be God's anointed ruler of the Sudan.

Nachtigal's investigations were pursued with typical German thoroughness, and the particular value of his work consists in the number of facts he amassed. The conclusions that he draws from these facts are not always sound. He laboured under one great disadvantage in Darfur, and that was that on account of the distrust of the European prevalent among the inhabitants in view of the preparations being made by the Egyptian Government to occupy Darfur, the sultan would not allow him to travel about, and all he saw of the country was confined to the main route from west to east, all his enquiries being made in the capital itself.

Another misfortune was that he died after two volumes of his great work, *Sahara und Sudan*, had been published; the third volume is the most important to us, since it contains his account of Wadai and Darfur, but it was compiled by a friend from his diaries, and the accounts of his travels which he had dictated to a stenographer during intervals in his work as British Consul at Tunis, and he had never gone through and corrected it.

The only documents which Nachtigal discovered in El Fasher were four contradictory lists of the sultans of Darfur². He believed that there

¹ *Travels*, III. 528.

² G. Nachtigal, *Sahara und Sudan*, Berlin. 1889, Vol, III. p. 356.

were two or three documents in the possession of the sultan, one of which was the almost fabulous Book of Dāli, the penal code established by Dāli, the traditional founder of the Fur or Keira dynasty, and the other document such as is frequently heard of but never forthcoming in the Sudan, a history handed down in some family for generations, which would solve a'l problems if only it came to light : unfortunately, it never does. Nor, in view of the assertions of Browne and Tunisi as to the absence of any written records in Darfur two generations previously, is it likely that any such document ever existed. Presumably the king lists which were shown to Nachtigal were verbal traditions committed to paper during the early part of the nineteenth century.

One of these lists gave 13 Daju kings, 13 Tungur chiefs, and 22 Keira sultans, as having ruled Darfur before sultan Ibrahim. Another gave 5 Daju kings and 25 Tungur and Keira rulers, and stated that the first Daju king, Gitar, was a contemporary of the prophet Salah who lived in Jebel Marra ; as it generally gave an incorrect version of well-known events, Nachtigal concluded that this list was less reliable than the first. The third list, which was in the handwriting of sultan Mohammed Fadl, endeavoured to prove that his family came from Arabia. (It gave Kuru as the son of Jāl Idris and grandson of Bahr Dalīl and descended by five generations from Ahmed al Ma'gūr).

In addition Nachtigal collected a number of verbal traditions with the help of Basi Tahir ¹, a notable who had been instructed by the sultan to help him in his investigations, although Nachtigal noted that the Basi concealed anything detrimental to the royal family. One of those traditions was to the effect that the Daju were for a long time lords in Jebel Marra, and to them the chiefs of surrounding tribes paid tribute. This was to some extent supported by a list of the Daju kings which Nachtigal obtained from a Daju prince exiled from Dar Sila, which gave 21 kings of whom the first six were pagans and lived in Jebel Marra. Tradition had it that the Daju were immigrants from the east, but did not connect them with the Arabs ; on the contrary, it attributed the transfer of power from their hands to that of the Tungur as due to the higher culture of the latter. Tradition was silent as to how the Tungur came to Darfur, but Nachtigal concluded that they must have introduced Arab manners and Arabic. The Tungur claimed ultimate descent from the Hijaz, but derived their more recent origin from Tunis, from Abu Zeid of the Bani Hilal, well known in Arabian

¹ In Darfur the *Basi* was responsible for the behaviour of the male members of the royal family. He had to be the descendant of a previous sultan.

folklore : and in all the king lists Ahmed al Ma'gūr was given as the tribal ancestor of the Tungur in Darfur. It was their superior intelligence and greater civilisation that enabled the Tungur to take the sovereignty from the Daju without a struggle, but at that time they were pagans or not sufficiently Muslim to spread the true religion among their neighbours, and in the midst of heathen began to relapse to paganism. They brought closer the union of the independent peoples living in the various hills.

Nachtigal noted that sultan Ibrahim also claimed descent from Ahmed al Ma'gūr, from which he assumed a connection between the Tungur and Fur (Keira) dynasties. He found support for this close connection between the Tungur and the royal family of the Fur in the tradition that when Ahmed al Ma'gūr came to the country, he ingratiated himself with the ruler of the time, who is said to have been Kuroma, though no such name occurs in any king list. Kuroma had a wife called Fora, who was a daughter of the chief of the Keira ; and their son was called Shau or Sau ¹. An alternative version was that Rifaa, son of Ahmed al Ma'gūr, had married the daughter of the Keira chief and their sons were Shau and Dali. Nachtigal pointed out a discrepancy here, for they cannot both be descended from the same parents, since in all king lists and traditions Shau is the last of the Tungur kings and his half-brother, Dāli or Dalil Bahr, is given as the founder of the Keira dynasty.

Nachtigal concluded that² :—

(I) The Daju ruled in Darfur for a few centuries, being based on Jebel Marra. The power then went from them to the Tungur without a struggle.

(II) The Tungur united in course of time with the Keira section of the Fur, and from this union resulted the Keira dynasty, which wrested the power from the Tungur after a struggle.

(III) It was under the Keira that Islam became established in Darfur, mainly in the time of sultan Suliman Solong, c. 1600 A.D.

Shau is usually said to have lived in Jebel Si³, while the capital of the Keira was Jebel Name⁴ in the Marra range. Shau, whose nickname Durschit or Dorsid was said to mean 'Lord over us', was a hard ruler who alienated his subjects, by forcing them to take part in many campaigns, and to dig wells and build palaces on hill-tops ; and in the end the people persuaded his half-brother Dāli to seize the throne. Shau returned from a campaign, but was defeated by Dāli near Jebel Name, and being pursued as far as his residence at Tūri in Jebel Si, vanished and was never seen again.

¹ There is no *sh* in the Fur language. *Shau* is the German spelling : the name is pronounced 'show' as in English 'how'.

² *Sahara und Sudan*, Vol. III. p. 360.

³ Not confirmed by the archaeological evidence.

⁴ See *Sudan Notes and Records* Vol. XX, p. 96,

Dāli, according to the tradition recorded by Nachtigal, laid the foundations of an organized administration in Darfur and promulgated laws, most of which survived till recently. He lived in Turra, which henceforth became the centre of the kingdom. From there he divided the country into five provinces, Dar Dāli (E), Dar Uma (S), Dar Dima (SW), Dar Tokonyawi (N), and Dar al Gharb (W), and arranged for the collection of taxes ; and he laid down the penal code (the Book of Dali) which was not based on the Quran, and by which all crimes were punished by fines in cattle or lengths of homespun (*takaki*). Nachtigal thought that Dāli probably ruled in the middle of the fifteenth century ; and that he was succeeded by about ten kings, as to whose names and order there was great uncertainty. Nachtigal collected nineteen names and graded them according to whether in his opinion they probably reigned, may have reigned, or probably did not reign. Among the last he includes Kuru, who was given in all the king lists as the father of Solong Suliman. Nachtigal gathered from the traditions he collected that Tunsam, son of Bahr Dalil, always described as the grandfather of the Musaba'at, was for a long time victorious in his struggle with Kuru, who was usually described as his brother, but in one list was described as his nephew.

Fur songs were still extant in Nachtigal's time ¹, in which the cause of the quarrel is said to have been the seizure by Kuru of Murunga, a royal appanage in western Darfur. Another song described the expulsion of Tunsam from Jebel Marra. Tradition was silent as to the details of the expulsion and only recorded that Suliman Solong *i.e.* 'the Arab,' so named because of his light complexion, established himself in Jebel Marra and became lord over almost all Darfur, while Tunsam and his men descended into the eastern plains (Kordofan) and was called *Musaba'awi* 'he who went east.' His adherents formed the Musaba'āt who have gradually forgotten their Fur origin.

Suliman Solong, son of Kuru, founded the kingdom afresh by his successful campaigns and the introduction of Islam. Nachtigal commented that in Darfur they tried to forget his ancestors, except Dali, because they were ashamed of the time when they were pagan. He thought that Suliman probably did not spread Islam throughout the whole country, but that he introduced it to the court, and made it the state religion. He led thirty-three campaigns and amongst other tribes he subdued the Zaghawa and the Tungur, who still sometimes tried to regain the throne.

Nachtigal first met the Tungur in Kanem. He records that he found them quite sedentary, and he was curious to get to know at first hand ² a

¹ They seem now to be forgotten.

² *Sahara und Sudan*, II. 256,

race whose origin was doubtful, and whom Barth regarded as a tribe that had forgotten its original language. Nachtigal's surmises and the asseverations of those Tungur whom he questioned agreed in attributing an Arab origin to them, and he found that they had no memory of having ever spoken a language of their own. Though many could speak Kanuri and Dāza, they invariably spoke Arabic to one author. However, he noted that they had adapted themselves more than any other outsiders to the life and institutions of the previous Kanembu inhabitants, as was witnessed by their title for their chief (*fugobo*)¹.

In writing about Wadai, Nachtigal noted that in overthrowing the Tungur and establishing a Muslim state 'Abd al Karim got his chief support from the Arabs²; that the time of the arrival of the Tungur in Wadai from the east is uncertain—but it can hardly have been a century before the introduction of Islam; that they were light-coloured, and Arabic-speaking, and are considered in Wadai and Bornu to be actual Arabs, but that in Darfur their power was broken before the introduction of Islam³, and while most of the Tungur in Wadai were Muslims, those at Abu Telfan were still pagan.

By the time he had studied the problem in Darfur, Nachtigal came to the conclusion that the Tungur⁴ apparently entered Darfur during the fifteenth century and sprang from the Bani Hilal. He concluded from local tradition that the Keira dynasty resulted from the grafting of the Tungur, an 'Arab' tribe, on to the proper lords of the land, the Fur: and that because of their small numbers, the Tungur succumbed to their partners and are now to be counted among the non-Arab parts of the Fur kingdom⁵.

Of the Tungur he remarked that they reached their largest numbers and greatest power in Darfur; yet there they intermarried with the natives from whom they can scarcely be distinguished, while in Kanem they are far less numerous—he assessed their numbers at 5,000—but there they kept themselves distinct from the natives and preserved their original physical characteristics.

He noted that the Daju had resided long in Darfur, and had, as is the case with most Muslim tribes in the Sudan, the tradition of having come from the east; although they certainly at an earlier period lived in Jebel Marra. While at one time the most important people of the land, they

¹ *Sahara und Sudan*, II, 329.

³ *Ibid*, III, 270

⁵ *Sahara und Sudan*, III, 448,

² *Ibid*, III, 205.

⁴ *Ibid*, III, 211, 272.

were despised and called 'nas Faraon' i.e., evil, violent men, and treated almost as pagans, so that in previous centuries they had to pay their taxes in children.

Henri Carbou, Administrateur Adjoint des Colonies, did not visit Darfur, but in his work, published in 1912, *La Region du Tchad et du Ouadai*, he states¹ that the Bulala were ruling in Kanem when the Tungur arrived from Wadai. The Tungur expelled the Bulala and put the Arabs under tribute. Then Dalafno came and defeated the Tungur and made them pay tribute to the kingdom of Bornu.

Of the Tungur, Carbou says,² 'ils sont d'origine Arabe, et l'on dit qu'ils descendent des Beni Hilal, qui, au temps du Prophète, résidaient en Arabie.' He considers that it is nearly certain that they lived some time in Tunis, for they all speak of Tunis al Khadra as their home. He describes the Tungur of Kanem as some of red complexion, but mostly dark (*akhdar*). They are not related to the Shuwa Arabs, but appear to occupy an intermediate position between the Shuwa and the Kanembu. They are in fact 'fractions issues d'un mélange d'Arabes et de negres.'³ 'En Afrique centrale, Arabe et Musulman sont également des termes synonymes.' As Carbou had studied the Tungur at first hand in Kanem, his views deserve consideration.

H. A. MacMichael (now Sir Harold MacMichael) was for a number of years political officer in Northern Kordofan, and his *Tribes of Northern and Central Kordofan* (1912) gave the result of his study of Darfur from across the frontier. In 1916 he was Intelligence Officer to the expedition which occupied Darfur on behalf of the Anglo-Egyptian Sudan, and then for more than a year sub-Governor of that province, during which period he toured Darfur and collected much valuable information which he published in 1922 in his *History of the Arabs in the Sudan*, the full title of which reads 'and some account of the people who preceded them and of the tribes inhabiting Darfur.' His eminent position, experience and scholarship make it natural that his views on the early history of Darfur are generally accepted.

MacMichael⁴ came to the conclusion that the Tungur had a Nubian origin. He was not impressed by the tradition that they came from the north from Tunis under Ahmed al Ma'gur of the Bani Hilal, 'for this

¹ *La Region du Tchad et du Ouadai* Paris, 1912. Vol. I, p. 25 (Hereinafter cited as, *Tchad*).

The date that he assigns for this event is clearly too late.

² *Ibid*, I.p. 73.

³ *Tchad*, II.1.

⁴ *History of the Arabs in the Sudan*, (hereinafter cited as '*History*') I.p. 66-71,

story is so obviously intertwined with the fabulous Abu Zayd or Bani Hilal cycle current in Egypt and the Sudan. . . that one would hesitate to accept any of its details as historically correct'

He considered, however, that possibly about the fifteenth or sixteenth century A.D., or even earlier, some Arabs or Arabo-Nubians with a Bani Hilal connection, moved westwards from the cataract region of the Nile to Darfur, mixed with the native races, and came to be generally known as Tungur. There was also in his opinion a bare possibility that the Tungur may have been related to Berber tribes dispossessed by the Bani Hilal in North Africa, and perhaps through them to the Bani Hilal themselves.

In support of a Nubian origin, MacMichael quoted the tradition recorded by Barth that they came from Dongola, and that recorded by Carbou that they had lived sometime on the Nile ; that the word *tungur* is said to mean 'a bow' in Nubian ; that the Nubians were celebrated archers ; and that there is a Tungur rapid (Tanjūr) on the Nile seventy-two miles south of Wadi Halfa ; and that, as he alleges, they use the sign of the cross in Darfur.

MacMichael thought that there had been misapprehension as to the nature of their occupation of Darfur ; and that they did not, as has been said, dispossess the Daju. Natives say that first the Daju ruled, then the Tungur, then the Fur ; but what they mean in the case of the first two is that each of them was the most powerful tribe in the country and not necessarily that one subdued the other or even occupied the same part of Darfur. For, says MacMichael, the Daju never had any shadow of power or influence in northern Darfur or (northern) Jebel Marra, and the Tungur never had any connection with the southernmost districts of Darfur or Jebel Marra. The main spheres of the two people were always distinct, except that they certainly met and overlapped in central-eastern Darfur (in the neighbourhood of El Fasher). MacMichael thought that there had been further misconception as to the Tungur. Nachtigal had spoken of Show Dorshid, the last Tungur king, as living in Jebel Si, and it had been inferred that the Tungur lived and had the seat of their rule there. MacMichael noted that recently at any rate the term Jebel Si has included the sandy *goz* to the east of the hills ; and since he could find no tradition in Si that the Tungur had ever occupied the mountains or had their headquarters there, he says " Nor is it in the least likely from what we know of their history that they ever bothered — or were able — to overrun these inhospitable crags and settle there. Why should they, when the fertile country to the east, and perhaps to the west also, was ample for them ? " MacMichael concluded that the Tungur, when they arrived in northern

Darfur, made their headquarters at 'Ain Farah¹ in Dar Furnung to the northwest of Kutum, and that their control extended over the eastern plains of Jebel Si. There was, no doubt, copious intermarriage between Fur and Tungur. The name Show Dorshid is familiar in Jebel Si still, but the greatest vagueness prevails as to details, and opinion is divided as to whether he was a Tungurawi, a Furawi or one of the prehistoric To Ra.

With regard to the Daju of Darfur², MacMichael considers that the grounds for any possible identification of them with the Tajua branch of the Zaghawa mentioned by Ibn Said are nil. Nor does he accept the tradition recorded by Browne that they came from the vicinity of Tunis. He prefers Barth's hypothesis that they may have come from the mountains of Fazogli south of Sennar, and suggests that, in view of their name for themselves in Darfur (Fininga) there may be some connection between them and the Fung.

They perfunctorily claim descent from the Beduin of the Hejaz, and say that their ancestor, Kedir, brought them to Kedir in the Nuba Mountains, and thence to Darfur.

MacMichael concludes that it is well established that the Daju were at one time the predominant race in central Darfur, the earliest known founders of a monarchy there, and that they were supplanted by the Tungur about the sixteenth century, though they never held any power in northern Darfur (the Tibu sphere), nor in Jebel Marra nor in the country northwest of it (the Fur sphere). The coming of the Tungur resulted in the restriction of the Daju to the districts where they now live.

With regard to the Fur³, MacMichael comes to no conclusion as to their origin. He notes that, apart from the Konjāra branch of the tribe, they are socially, physically and intellectually inferior to the average Darfur tribe ; and that it is the vitality of the Konjara, due to an Arab strain, which has preserved for the Fur the predominance gained three centuries before. An extra measure of prestige has been due to the traditional connection of their royal house, the Keira, on the female side with the Bani Abbas and the Bani Hilal.

The Fur were living in a state of savagery until some Bani Hilal Arabs under Ahmed al Ma'gūr, a descendant of Abu Zayd al Hilali came to Darfur ; and a descendant of Ahmed al Ma'gūr named Suliman Solong finally established an overlordship over the Fur and welded them into a single political unit. He and his son, Musa, ruled from Turra, where the

¹ See *Sudan Notes and Records* XIX. pp. 301 ff.

² *History*. I. 71-76.

³ *History*, I, p. 91 ff.

aboriginal population is fabled to have been the To Ra, but no more is known of them, and they are not differentiated from the original Fur.

MacMichael notes that the traditions as to Suliman Solong's parentage are vague and various. Both Fur and Tungur, while admitting that they differ from one another in race, each claim to be descended from Ahmed al Ma'gūr.

MacMichael had discussed Daju and Tungur origins earlier in his *Tribes of Northern and Central Kordofan*, but presumably the above, where they differ, are to be taken as his mature conclusions. He seems not to have read Nachtigal in the original, but only in the French translation of his visit to Wadai and the abstract from his work made by Dr. Helmolt for inclusion in his 'World History'. This is unfortunate, for the traditions collected by Nachtigal, if posthumously presented in some slight confusion, are important.

CHAPTER III.

THE FUR.

The Fur have given their name to the country of which we are studying the history. *Dar* (arabic) means 'habitation' and so 'home'; 'Darfur' means 'the land of the Fur'.

As we have seen, Nachtigal and MacMichael hold conflicting views on the origin of the Fur dynasty which came to an end in 1916. Nachtigal considers that the Keira dynasty arose from a union of the Keira, one section of the people, with the Tungur dynasty. MacMichael, on the other hand, thinks that, whatever the origin of the Fur, they are a negroid race of low type, who owe the virility and higher intelligence of their aristocracy, the Konjara, to an Arab strain.

The Fur, however, appear to be the original negro inhabitants of the country. There are more than a dozen different languages spoken in and around Darfur in addition to Arabic¹; and light can sometimes be thrown on the origin of a tribe by a comparative study of the names by which that tribe is known to its neighbours. The task is not as easy as it would have been a few years ago, for many of these languages are rapidly absorbing Arabic names and words. But, if we can establish whether the name

¹ The most important are: Fur, Daju (different dialects in Darfur and Dar Sila), Zaghawa and the closely related Bedayat, Daza (Goraan), Meidob (2 dialects), Birgid Berti (almost extinct), Tama, Masalit, Maba (Burgu) and Runga.

'Fur' is the tribe's proper name or a nickname, and what is probably the original form of that name, we shall be in a better position to suggest what the name Fur means and how the people that bear it come by it.

The Fur are known as :—

Kora	to the Zaghawa	(Kura, Bedayat)
Kürgura	„ „	Berti
Kurka	„ „	Meidob
Kadirgi	„ „	Birgid
Hur (?)	„ „	Goraan (Dāza)
Furta	„ „	Masalit
Furuk	„ „	Tama
Furgei	„ „	Burgu (Māba)
Unāgi	„ „	Daju (of Darfur)
Yergi	„ „	Daju (of Sila)

The Fur have no definite name for themselves as a tribe. After more than two centuries under sultans, who, whatever their origin, towards the end of the dynasty were indistinguishable from their negro subjects in appearance, and who were known to outsiders as the sultans of the Fur¹ any original stigma there may have been in the name Fur had been forgotten : yet if a Fur man to-day is asked to what tribe he belongs, he will not readily say 'Fur'. If he can claim any relationship with the Fur sultans he will say Keira, and if not, he will usually try Konjara, a more general name for the aristocratic Fur ; and failing that he may even try Musabaāt. Keira and Konjara will be discussed shortly. As to the meaning of Musabaāt the modern Fur are very vague. The name means , those who have gone east ' (debased Arabic ²) ; and was first applied to the followers of Tunsam who were expelled from Darfur in the civil war which brought Suliman Solong to the throne, but it is now thought by many Fur to mean ' easterners ' and so ' Arabs (who have come from the east) ' ; and hence they claim to be Musabaāt on the strength of their being Muslims.

If pressed about their own origin, the Fur will tell you that Fir and Firat were brothers, and that they are descended from Fir, while the Fertit

¹ The existence of Darfur is said in Petermann's *Mittheilungen, Ergänzungsband* 11. 1862-3, p. 42 to be mentioned as ' Fohr ' in J. M. Vansleb's account of a visit to Egypt in 1664, but it is not to be found in the work to which it is there referred, his account of his second journey to Egypt in 1672-3, and is therefore probably in the account of his first journey in 1664 which was eventually published by H. E. G. Paulus in his *Sammlung der Merkwürdigsten Reisen in den Orient*, published at Jena 1792-1803,

² MaçMichael *History* I, 93n,

are descended from Firat. 'Fertit' is not a tribal name but a general name meaning 'pagan', and covers a number of tribes to the south-west of Darfur, many of whom are now resident in the western part of the Bahr el Ghazal province. The name is exactly equivalent to the name 'Kerdi' or 'Kirdi', which in Wadai and Bagirmi is used for the pagan tribes living on the southern fringes of those countries. In fact there can be no doubt that Kerdi and Fertit are the same words¹.

In discussing the origin of the Fur with the old Gawāma² *imam* of the mosque at the tombs of the Fur sultans in Turra, and with his relations I was told that Fur is not a race but a language, originally the language of the Kora Kwa³, the inhabitants of the mountains of Jebel Si, whose language has gradually spread.

In a discussion with Mohammed Ahmed, a great-grandson of sultan Mohammed Fadl, and a number of elders from Dar Dima in Western Darfur, I was given an account of the course of events in Darfur during medieval times, which sheds considerable light on the origin of the Fur. To these old men 'the land of the Fur' meant what is now called Western Darfur, i.e. the country on the west side of the Jebel Marra range, lying roughly between Kebkebia and Dar Fungoro. This area, they said, was originally inhabited by tribes such as the Binga, the Banda and the Gula⁴. The first sultan who introduced Islam lived in Dar Furok in northern Darfur⁵. He gradually spread his empire further south by sending in turn to the 'king' of each hill, saying 'Become Muslim or I will fight you' Given this alternative, most of the people fled south, and were henceforth known as Fertit, leaving much of what is now Dar Fur uninhabited, to occupy which the sultans used to introduce foreigners. Those on the other hand who accepted Islam and submitted to the rule of the sultan were known as Fur.

¹ Cf. also *erdi*, which means 'pagan' or 'enemies' in Daza and Teda. See Barth *Sammlung und Bearbeitung Central-Afrikanischer Vokabularien* I.p.1xxxix. (Hereinafter cited as '*Sammlung*.')

² These *imams*, who are descended from a man who became *imam* of the mosque in the time of sultan Musa, son of Solong, claim to be Gawama'a from Kordofan, but as elsewhere in Darfur their name probably comes from the Arabic جامع (*jami'* = 'mosque') and simply means 'the mosque people'.

³ *Kwa* means 'people' in Fur.

⁴ Cf. MacMichael *History* I, p. 97. There are still remnants of the Gula in J. Marra and Dar Fungoro, of the Binga in Dar Suro (W. Darfur), and of the Banda in J. Marra.

⁵ Presumably at Uri. See below, c.9, and *Sudan Notes and Records* XXVII pp. 185 ff.

To this explanation of the name 'Fur' as meaning 'followers' is to be compared the name of that section of the Mima of Wadaa east of El Fasher, who are known as Fira, and are said to have been in origin the soldiers or followers of the Mima ruler, and also perhaps the Dāza (Goraan) word *firga* or *hirga* (fem. *Girei*) which means 'servant' and implies 'slave'.

Omitting for the moment the Daju and Birgid names of the Fur, the other versions of their name as given above fall equally into two divisions, the form FUR, now universal wherever Arabic is spoken, and a form KUR (in Zaghawa, Meidob and Berti) which appears to be the older form of the name, and dying out, although it is preserved intact in the name of the Kora Kwa of Jebel Si.

In casting round for a possible explanation of the origin of the name Kur, I was struck by the fact that Kuri is the name given by the Kanembu to four or five different peoples who live in the swamps of Lake Chad; the most important of them are called the Budduma—'the people of the reeds,' and among the others are the Kālia or Kāria, who are in origin the slaves of the Budduma and claim descent from one Kāli. In discussing the origin of the Kuri with Mohammed Abdalrasul, a relative of the Khalifa of Mao in Kanem, (who belongs to the Dalatoa), and with a Diri pedlar from Kuludia on Lake Chad, who both came to El Fasher on their way to the Nile in search of work, I was told that Kūri is the Kanembu name for all the inhabitants of Lake Chad—apparently it is now looked on as equivalent to 'people of the lake.' They said that of these people the Budduma are the oldest being descended from one Budma the son of Koromi, once the ruler of all the Kuri, who had three sons Ngaladiu, Kalameidia and Kurā, the Karia being their slaves. We have here a good example of the imaginary eponymous ancestor, for the proper name of these people is Yedina, and Budduma is known to be a Kanuri word meaning 'the people of the reeds'; no doubt the sons of the fictitious Budma are equally fictitious, being invented to explain the name of the other Chad tribes, as Kāli the ancestor of the Kāria, whose name only means 'slaves.'

From photographs the Kuri of Lake Chad appear to be physically similar to the Fur of Western Darfur, and it appeared that there might be some physical connection between the Kora Kwa and the Kuri, although being geographically over five hundred miles apart it was not surprising to find no apparent connection between the two languages.

The name 'Kuri' is now sometimes explained as meaning 'big head' from the Kanuri word '*Kura*' = 'great,' but this explanation is not convincing, and the true explanation appeared yet to seek.

There is probably a common origin to the names of the Kuri, of Koara (an old name for the river Niger), of the oasis of Kawar near Bilma on the road from Tripoli to Lake Chad, and of the term Takrūri, which still to-day at Mecca is practically equivalent to 'Sudanese'.

The best evidence in support of this statement is to be found in the Arab authors of the middle ages. The earliest occurrence that I know of the name Kawwar is in Ya'qubi¹ (d. 893 A.D.), who mentions a city of that name fifteen stages beyond Zueila.

In Bekri² (d. 1094 A.D.) Kawwār is spoken of as a country fifteen days beyond Fezzan, full of castles, all of which were reduced by the Arab leader Ugba, except the capital, Jawān, a large 'castle' at the head of a waterless plain on the top of a bush-covered hill.

Idrisi³ (d. 1153 A.D.) mentioned the alum mines of Bilma, which produced the best alum in the land of Kawār, and was a day's journey from Abraz, just west of which was a lake in which was an excellent kind of fish like the *bury*, which was salted and sold in large quantities all over the land of Kawār.

Yakut⁴ (c.1200 A.D.) says that Kāwār is a spacious quarter south of Fezzan behind the oasis in which are many towns including Abu al Bilma, Qasr Umm Isa and Balās, and that it had a sultan who was subject to the king of the Zaghawa.

Ibn Said (d.1274 A.D.), whose text I have not seen, is translated by M. Reinaud⁵ as follows :— le pays des Kouars, nom d'un peuple noir qui professe l'islamisme. Le chef lieu de ce peuple porte le même nom. Ce pays est maintenant soumis au sultan du Kanem ; sa situation est sous le 45e degré de longitude, et le 20e degré et quelques minutes de latitude, A l'occident à la distance de deux marches est le lac des Kouars (bohayré Kouar) Il s'y trouve le boury A l'orient de Kouar, à la distance d'une marche, est le lac de Soul De fréquentes querelles ont lieu, sur les bords de ces deux lacs, entre les Kouars, les Berbers du Sahara, et les Arabes nomades du Fezzan, qui viennent, sans cesse, faire paître leurs troupeaux de ce côté.

Parmis le lieux du pays de Kouar qu'on cite, est le château d'Issa ce château est situé au nord-ouest de Kouar, sur la route, à une distance de quatre marches . . .

¹ *Kitab al buldan.* p. 345.

² *Kitab al Maghrib* p. 11.

³ *Kitab nazaha al mushtaq fi akhtaraq al afaq.* p. 40 (third part of the Second Clime)

⁴ *Geographisches Worterbuch.* Leipzig. 1869.

⁵ *Geographie d'Aboulfeda.* tr. Reinaud. cxliii and 218.

SUDAN NOTES AND RECORDS

Tout ce pays recèle, dans son sol, de l'alun, qui s'exporte ailleurs. La contrée de Kouar renferme d'autres lieux habités et d'autres villes ; mais on n'en a que des notions confuses. Les plaines où errent les Kouars commencent au nord du premier climat (en deça du 16e degré de latitude) et s'étendent jusque dans le troisième climat (au delà du 25e degré). Les Kouars ont adopté les habitudes des blancs, en ce qu'ils s'habillent comme eux de laine, de coton, et d'étoffes rayées.

Au midi du pays des Kouars est la grande montagne de Lounya (جبل لونيا)¹, laquelle s'étend de l'occident à l'orient. Le revers septentrional de cette montagne est occupé par les Berkamy (بركامي), peuple nègre qui habite des gorges plantées de palmiers, arrosées d'eau, et couvertes de verdure. La portion des Berkamy qui avoisine le Kanem professe l'islamisme : celle qui touche aux Nubiens professe le christianisme, et celle qui est contigue au pays des Zeghaouas adore les idoles. Les Zeghaouas occupent les plaines situées au midi de la montagne.

Le pays des Kouars est terminé, vers le nord, par la montagne de Garga (جبل غرغه).....'

Ansari² (d.1327 A.D.) speaks of Lake Kury (*baheirat Kury*) : from it flows a river on which stands Kuku (? Gao), and which eventually flows into the river of Ghana (also called *bahr al Habasha*) after flowing through Kanem, which he describes as coterminous with the Habash (? Hausa) country. He mentions here a *wadi* like the Wadi Kavar. In another place³, describing the Sudan, he says that the inhabitants are divided into Muslims and pagans, the Muslims being distinguished by the power to which they pay homage (Kanem, Ghana, Kuku, Kavar, Fezzan or Zaghawa); and he also says⁴ that في بلاد كوار السودان ('in the land of Kawwar of the blacks'—could this mean 'of the Kawwar, i.e. the blacks'?) west of Asben is the salt lake that produces the *bury* fish.

Abu al Feda (d.1332 A.D.) describes the Nile as flowing out of Lake Kura (بحيرة كورا)⁵, through the lands of the Sudan, first through the Zaghawa, and then the Nuba with their capital Dongola. In another passage⁶ by *baheirat Kury* he clearly indicates Lake Chad.

Maqrizi (d.1441 A.D.)⁶ quotes Idrisi as saying that the Nile flows from a lake called Kuri after a tribe of savage blacks, who live round it and eat

¹ Loukya of Idrisi. Presumably the Ahaggar-Tibbesti massif, perhaps originally Lubyia لوبيا

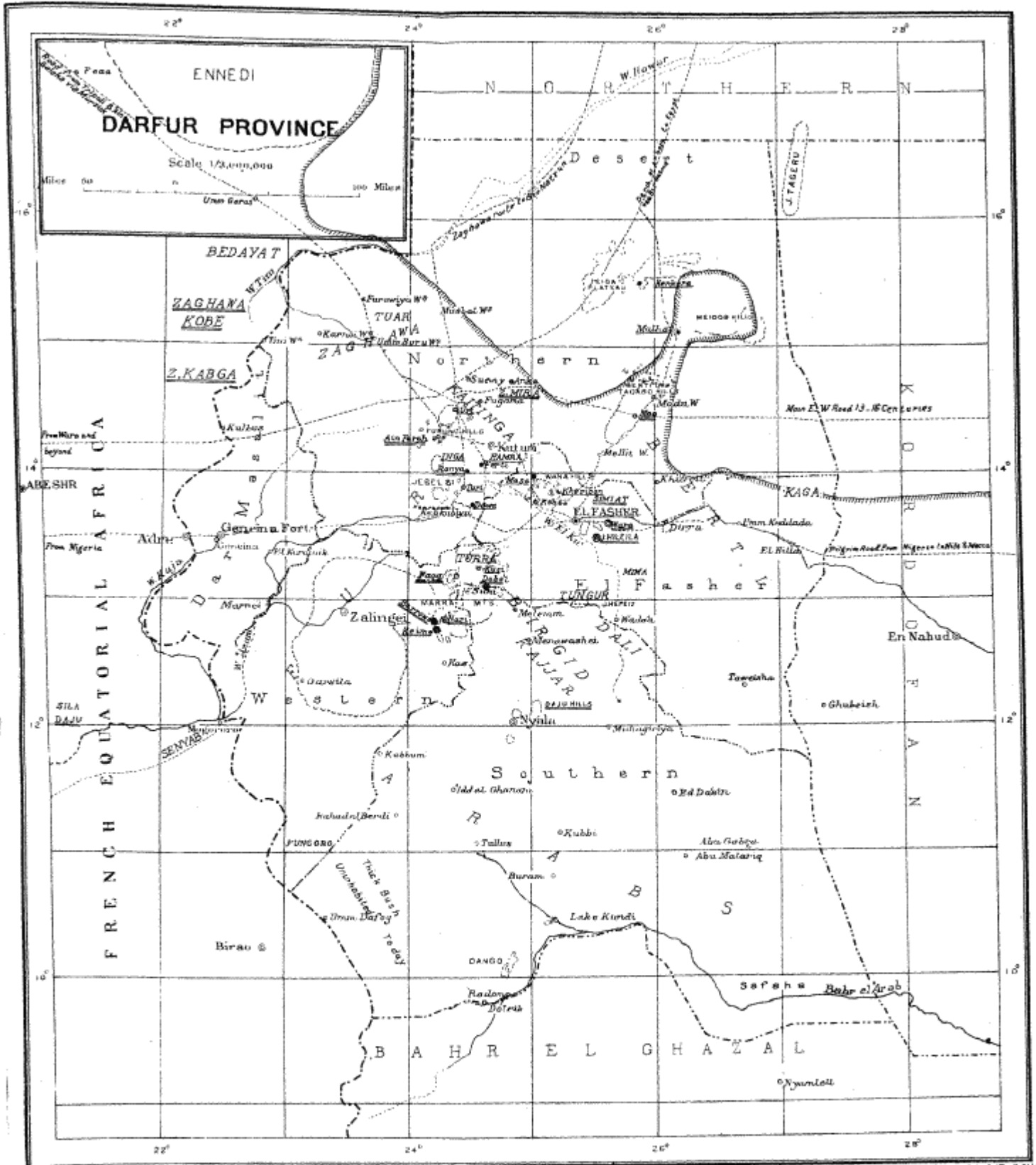
² *Kitab nakhbat al dahr fi 'ajaib al barr wa al bahr.* p. 240.

³ p. 268.

⁴ p. 122.

⁵ *Taqwim al buldan.* p. 45.

⁶ *Al Khitat.* I, p. 85. (Cairo edn.)



Sudan Survey Dept., Khartoum, Dec 1950, (Topo No 5 847-50)/18

Names underlined Once indicate a connection with TUNGUR during the period
 " " Twice " " DAJU
 " " Three Times " sites attributed to BORNUE-KANEM
 Hatched line indicates northern limit of permanent habitation to-day
 Tribal names show position of tribe to-day

people who fall into their hands. (He here indicates Lake Chad.) From this depression flows the river of Ghana and the river of Habash; also the Nile flows out of it through the villages of the Kūry (بلاد كورى) and of the Yina, who are tribes of blacks living between Kanem and Nuba, until it reaches Dongola the city of the Nuba, bending from the west.

I suggest that in all these names we have a word used by the Berbers to describe the black tribes with whom they came in contact south of the desert; that this name was borrowed by Arabic, in which it usually took the form Kūry (كورى) in the singular and Kawwār (كوار) in the plural; and that Kawwar is thus the exact equivalent of the word 'Sudan.' This originally had the general meaning '(land of the) Blacks', and has lately become localized in the valley of the Nile, and also as one of the provinces of French West Africa. In the same way Kuri-Kawwar became localized in an oasis inhabited by Teda on the road from Fezzan to Lake Chad (Kawar)¹, in Lake Chad (where the aborigines are still called Kuri), and in the Fur of Darfur, who fit Maqrizi's description of the Kury as a tribe of blacks living between Kanem and Dongola.²

I must now explain why I think that 'Kuri' means 'black' in Berber. *Ikowelen* means 'blacks' in Tamashek, and *akli* in the same language means 'slaves'. The Berbers, like the Arabs, looked on all blacks as natural slaves, so that it is not surprising if they used the word 'black' as synonymous with 'slave'. R and L are frequently interchangeable in Africa. The root K L meaning 'black' may be traced from Kanem to Darfur:—

chilung means 'black' in Kanuri

chilim „ 'black' in Kanembu.³

ili (plural *kilgi*) means 'black' in Maagi (Bulāla).

gil means 'black' in Daju.⁴

With the secondary meaning of 'slave' the same root may apparently be seen in the following.

¹ Barth. *Travels*. V. 428. „Wādi Kawār, as it is called by the Arabs, or the Henéri-Tegé, valley of the Tegn or Tedà, as it is called by the natives.”

² J. Marquart in *Die Benin Sammlung* p. cxiii also holds that a mention by Idrisi in his Second Clime of the camping ground of nomadic Kawar near the ruined city Sharu cannot have referred only to the Teda inhabiting the oasis of Kawar and that it probably refers to all the inhabitants of Tibesti, Borku and Wanyanga.

³ Hence presumably the origin of the name 'Salamat' the black Arabs south west of Wada

⁴ We may probably also connect with this root in the west *kerā*, which is said to mean ai 'dark skinned woman' in Ffulde (Palmer, *Sudanese Memoirs*, III. 70), and in the east the tribal names Acholi, Shilluk, Tigre, Galla and ? Shangala. Compare *guracha* = 'black' in Galla and *tzalim* = 'black' in Tigrine. Cf. also Seligman *Some Aspects of the Hamitic Problem in the Sudan* JRAI XLIII. p. 601 ff. The Haden-doa call the Bedawib *tigri*, and speak of them almost as slaves.

<i>chili</i> or <i>kili</i>	in Darfur Daju.
<i>chiri</i>	in Sila Daju.
<i>ageri</i> (pl. <i>agra</i>)	in Daza. ¹
<i>hirga</i> or <i>firga</i> (fem. <i>birei</i>)	—'servant' in Daza.
<i>karia</i> (fem. <i>kir</i>) ²	in Kanuri and Kanembu.
<i>ngaru</i>	in Sao, one of the languages of the Budduma group. ³
<i>ngura</i>	in Gula.

and perhaps *ura*, which is said to mean 'slaves' in Diga, and to be their name for the Fur.

The above examples establish at least a probability that Kora, the original name of the Fur, meant 'blacks' with the connotation of 'slaves'. In the days when the influence of the north first made itself felt in the land of the blacks, and the first aim of the local sultan, who owed his power to a slave army, was to increase his revenue by the export of slaves, all his black subjects were potentially his slaves. It is therefore not surprising if the same root, in the modified form FR⁴ acquired the further meaning of 'subjects' or 'followers'; as in the Fira section of the Mima and Abo Mohammed Ahmed's explanation of the origin of the Fur quoted above.

The Fur must therefore be the black subjects of the early Berber-speaking sultans of Darfur.

The explanation of their name in Birgid, 'Kadirgi', may be as follows. The new and better weapon in warfare is one of the most important factors in history. The early rulers in Darfur, who hailed from the north, presumably owed their power to their superior weapons, which were spear,⁵

¹ Daza is the real name of the people usually called Goraan. If pressed they will admit that the name Goraan 'means' slaves', from *agra* in their own language, and that it was given them by the Arabs. This name has thus nothing to do with the Garamantes or inhabitants of Germa in Fezzan. Cf. Barth *Travels* III. 194 "The Arabs generally add to the name Tebu the word GRAAN or GURAAN, which I think myself justified in referring to the District Goran, so often referred to by Leo Africanus. The Tibu themselves I never heard use the name and forgot to ask the meaning of the word. In their own language they call the Kanuri Tuguba, while they call the Tuareg Yeburde".

² The word probably comes from the root KR and not from the Arabic *Jaria*, which only means 'handmaiden' and is never used of a male slave.

³ Gaudetroy-Demombynes. *Actes du XIVe congres international des Orientalistes*. p. 266.

⁴ For the ease with which K changes to F through H see Barth *Sammlung*, p. lxxi. Examples of this change have been already given. Many Bedayat cannot say 'Fur'; they pronounce it *Hur*.

⁵ In the days of dynastic Egypt the foreign countries surrounding Egypt were known as the Nine Bows, and Nubia was known as Ta-pedet or 'Bow-Land' (Breasted, *A History of Egypt* pp. 151 and 178.) This appears to indicate a probability that all African tribes known to the dynastic Egyptians were at that time armed with bows.

shield, horse, sword and then later fire-arms. In the early days the ruling people presumably armed the blacks, who became subject to them, with spears.¹ Their name Kora, besides meaning black slaves may then have come to mean 'spear-men,' and if so, may easily have been transferred from the man to the weapon he carried. I make this suggestion as a possible explanation of the fact that words containing the root KR or something like it also mean 'spear' in Fur and some neighbouring languages :—

- kor* = 'spear' in Fur.
ngoro = 'spear' in Maagi (Bulāla).
gorge = 'spear' in Kuka.
ku = 'spear' in Zaghawa and Berti.
kuturr = 'spear' in Meidob.

Compare also *gergit* = 'barbed spear' in Fur.

If there is anything in this theory, some word like *kadir*, comparable to the Meidob *kuturr*, (for both the Meidob and Birgid languages have a common Nubian origin²), may once have meant 'spear' in Birgid, although that language now uses *sal* for spear. Slight support for this theory may be found in the fact that *gergit* = 'barbed spear' = *sambei* in Daju and in Fur as spoken in Jebel Si, and that *sambei gergit* is a title for a lesser chief in Jebel Si, and elsewhere, e.g. *gergit* in Dar Gimr and *sambei* among the Darfur Daju; and that these titles are more or less equivalent to that of *dimlig*, which means 'copper bracelet,' a lesser chief subordinate to the *shartai*, whose name means 'drum.' Presumably all these titles originated in the early sultan's army, the barbed spear or copper bracelet³ being the insignia of officers of different rank, and the drum, as being the ancient equivalent of the wireless by which orders were issued, being the prerogative and so the insignia of an independent command.

Since 'Fur' means 'blacks' it is possible that Keira, the name of the royal Fur, means 'reds'; since

- keili* = 'red' in Meidob.
keileia = 'red' in Birgid.

¹ Compare the striking rock picture from Basutoland published in the *Illustrated London News* of 29.4.33 (pp. 110 and 111) which shows naked red bowmen resisting with some success a force of black men who are armed with spears, and wear turbans which also veil the lower part of the face. The artists probably belonged to some tribe that had refused to submit to a slave-raiding sultan of northern origin, and had been in consequence forced to retreat into south Africa.

² See Zyhlarz. *Zur stellung des Darfur-Nubischen*.

³ It is just possible that there is some connection between the copper bracelet and *Suwar al dahab*, gold bracelet, the surname of a well known Sudan family which probably has its origin from one of the royal insignia of Nubia.

It may however be connected with *qere* = 'king' in Meroitic, and therefore probably with Tungur *Kirati*, Zaghawa *kiri* = 'sultan' and therefore with the name Konjara as well.

Konjāra, the general name of the aristocratic Fur, probably means 'chiefs,' and is comparable with :—

<i>kongare</i>	= 'chief' in Sara Domje. ¹
<i>kogara</i>	= 'chief' in Horo.
<i>ngar</i>	= 'chief' in Sara Lak.
<i>ngari</i>	= 'sultan' in Maagi (Bulala).
<i>ngale</i>	= 'chief' in Barma, Bulalaac.
<i>gare</i>	= 'chief' in Bagirmi. ²
<i>nyere</i>	= 'chief' in Bongo.
<i>neri</i>	= 'sultan' in Banda.

The underlying root here is probably the Berber root MGR meaning 'great' which occurs in :

<i>Amukkar</i>	'the great' = 'God' in Tamashek.
<i>amaghar</i>	= 'an elder' in Tamashek. ⁴
<i>mugur</i>	= 'sultan' in Birgid.
<i>paqar</i>	= 'prince' in Meroitic.

Compare also 'Bokorigi,' the name for all Daju in the language of the Daju of Dar Sila, which probably means 'the sultan's people' :

<i>bogei</i>	= 'sultan' in the dialect of the Daju of Darfur.
<i>bugade</i>	(with alternative form ' <i>buguri</i> ') ⁵ = 'chief' in Daza.
<i>kiri</i>	= 'sultan' in Zaghawa.
<i>qere</i>	= 'king' in Meroitic.
<i>koriam</i>	= 'great' in Meidob.
<i>ugur</i>	= 'great' in Birgid.
<i>kura</i>	= 'great' in Kanuri.
<i>kullai</i>	= 'great' in Maba.
<i>goli</i>	= 'great,' 'old man,' in Mukolo (Geira).
<i>mugelu</i>	= 'great' in Kuka = ? Maagi (Bulāla).

Tunisi divides the Fur geographically into Konjāra, Kerākirit and Temurka, and MacMichael corroborates this division, but, as it seems, incorrectly. The Kerākirit certainly are the inhabitants of Jebel Si, the people whom the Fur call Kora Kwa. The name Kerākirit is probably

¹ Gaudefroy-Demombynes. *loc. cit.*, p. 199 &c.

² Gaden. *Essai de Grammaire de la Langue Baguirmienne.*

³ See Oric Bates. *Eastern Libyans.* p. 79.

⁴ Barth. *Travels.* I. 344.

⁵ Carbou. Tchad 1.231.

an Arabic corruption of the name Kora Kwa. It may, however, come from *kerkera*, the round stone hut with conical grass roof which is built by the Kora Kwa, though the house that is peculiar to the Kora Kwa is the circular stone with a *flat* roof called *geira*.¹ The area inhabited by the Kerkerit can be definitely delineated, as can also that of the Temurka. The latter name appears to be an Arabic corruption of Tamera Kwa, the name given by the Fur of Jebel Marra to all the Fur-speaking people who live west of them. It is not used by the Fur it denotes. The Fur of Jebel Marra look on these western Fur as uncouth boors who like dirty clothes etc. It is impossible however, to draw any line on the map around the Konjāra.

Nachtigal² collected the names of forty different divisions of the Fur. Of them he mentions four, the Temurka whom he believed to be the purest the Dugunga who seemed to him the noblest, the Konjāra, after whom Darfur was often called Dar Konjāra, and the Keira, who politically obtained a high place because they were related on the female side to the previous dynasty of the Tungur. MacMichael³ considers that the sub-divisions of the Fur, apart from the three main groups already discussed, are local or totemistic in origin rather than linear. Their names are taken, not from a common ancestor, but either from some hill or valley or some bird or beast or grass. That they are not linear (except in sections of recent formation), I agree, but for the belief that they are in any way totemistic there is not a shadow of reason. Some of the commonest names are functional or of a similar nature, as is only to be expected if our explanation of the name Fur is correct. In the royal estates on Jebel Marra we find the people of the sword-hilt (Tuminga), for the silver mounted sword hilt (*tum*) is the prerogative of royalty, the people who carry the throwing knives (Sambalanga)⁴ or who blow the horn (Algunga)⁵ in the royal hunt. The Meirenga were probably the people of the *Meiram* or princess, to whose service they were originally appointed. MacMichael was told that this section was named after the grass *mayri*, and I have been told that their ancestor was a man called Meire; but they occur in several localities. Then there were the Kamninga, Furenga and Gabanga, the men appointed to the service of, or living on estates allotted to, the dignitaires *Abo Kamni*,

¹ ? Connect with 'Keira,' as meaning the type of house introduced by, and originally alone used by, royalty.

² *Sahara und Sudan* III. p. 450.

³ *History* I. 94.

⁴ Nothing to do with Shenabla Arabs, the favourite explanation to-day.

⁵ This is frequently explained as 'experts in tonsil or uvula cutting' from 'halq' Arabic for 'throat.'

Abo Fore and *Abo Gabayin* ; and the Bātinga (from *baati* 'a leather bag') the descendants of a Syrian artilleryman captured in the eighteenth century who became an official of the sultan's court

Two sections alleged to be named after birds are the Tebella and the Suninga. Tebella does not really mean, as MacMichael states, 'doves,' though Jebel Tebella is famed for its doves. *Tebella* is said to mean 'a mingled population,' and while *suni* does mean 'blue rock pigeons', the Suninga are the people of the Suni valley, which may be named after rock pigeons and may be named after the early white men (Tora), whose ruined settlements and irrigation terraces are a feature of the valley.

The Tōra are not, as MacMichael alleges, confused with the original Fur. They are everywhere looked on as distinct from the Fur; and are said to have been white invaders who built in faced stone masonry. In Turra they told me they were Abu Qonaan; and they thought Show was the last of the Tōra—in fact they did not usually speak of the Tungur but of the Tora—while at the southern end of Jebel Marra, where on Jebel Keima are the rough stone remains of a building said to have been the palace of Kushur, usually known as the first Daju king, the term 'Tora' seemed to include the Daju. Thus to the Fur the Tora are the early white people who taught them how to build houses in stone, and to form terraces and irrigate; and that they are sometimes called Abu Qonaan is a fair indication of the probability that they belonged to a Berber-speaking people.¹ The term seems to include both the Tungur and the Daju, the early rulers of the country, who elsewhere in Darfur are distinguished from one another

CHAPTER IV.

THE DAJU.

We have seen that the Fur appear to have been welded into a people or tribe from the early negro inhabitants of the country, by light coloured immigrants, speaking a Berber language. Can we discover who these rulers were? If we can trust the most general tradition, they are thought to have been the Daju; and in investigating the history of a people with no written records, the safest principle is to accept tradition, unless reasons appear for distrusting it. Is there then any reason for thinking that the Daju were the Berber-speaking rulers, who first brought some form of civilization and organized administration to the inhabitants previously

¹ Çaṇaan is always given in Arab genealogies as the ancestor of the Berbers,

living in primitive savagery? And is MacMichael correct in considering that the spheres of the Daju and the Tungur did not appreciably overlap?

Sir Richmond Palmer¹ disputes MacMichael's view that there are no grounds for any possible identification of the Daju with the Tajuwa branch of the Zaghawa mentioned by Ibn Said, and Sir Richmond seems to be right. An examination of all references to the Tajuwa in the medieval Arab writers will make the matter clear.

The first mention of the Tajuwa (تاجووه) in literature of which I am aware, is in Idrisi (d. 1153 A.D.), who places them between the Zaghawa of Kanem and Nuwabia (بوايه), i.e. more or less exactly in Darfur. He says of them in the third part of the 'First Clime'²: "From Manān to the city of Tajwa (تاجوره) is thirteen days journey. This is the capital of the Tajuwiin who are pagans. Their land is contiguous with that of the Nuba, and in their land is Simia³ (سميه) a small town. Some of people who have travelled to the land of Kawār (كوار) relate that the lord of Bulāq (? Philae) (صاحب بلاق), an *emir* of the king of the Nuba, went to Simia and burnt it, and destroyed it, and dispersed its contents beyond recovery, so that it is now in ruins. From it to the city of Tajwa is six days journey; and from Tajwa it is eighteen days journey to the city of Nuwābia (نوايه) from which the Nuba get their name." In the third part of the 'Second Clime'⁴ he says: 'But as for that part of the land of the Tajuwiin which is included in this part, they are blacks pagans many in number, rich in milk, having many herds of camels, and good grazing. They are a tribe with no fixed abode; they raid all their neighbours and are jealous of them using cunning to capture them. They have no towns except Tajwa and Simia, already included in the First Clime The land of the Tajuwiin is also coterminous with the land of the Oasis of Kharga'. In the fourth part of the 'Second Clime'⁵ Idrisi continues: 'The upper portion of this part in the west, where the rest of the land of the Tajuwiin is, is all pure desert. There used to be much water in it and pools. There are now no inhabitants in it, because there are moving sands which are shifted by the wind from place to place, and no one has a permanent habitation in it, because the sands pass over it, and the winds blow strongly on it.'

¹ 'The Kingdom of Gaogha of Leo Africanus' in *Journal of the African Society* XIX (1930) p. 281.

loc. cit. p. 10.

An alternative reading is *سمنه* (Semna or Samina).

loc. cit. p. 40,

⁵ *loc. cit.* p. 42,

All the above quotations can apply to Darfur, although the town of Tajwa cannot be identified. If Simia is the correct reading for the name of the second town, it was probably situated in the Simiat hills, which lie about twenty miles east of El Fasher. There are traces in these hills of a tribe now calling themselves Simiat, some of whom have moved south-west to the borders of Wadai, where till recently they were known as Simyar,¹ and now are called Senyar by the Arabs.

The inhabitants of the Simiat hills, some of whom reckon themselves Simiat, today call themselves Berti, although they are not counted as Berti by the Berti of eastern Darfur; and they have a tradition that the previous owners of the land who built the numerous stone ruins on the hill, were Daju. There are indeed two sites in the Simiat hills which are pointed out as residences of Daju sultans, one on Jebel Wāra and one on Jebel Hileila. I was not able to examine either of these sites, but from a description that at Wāra must have been an imposing if not extensive town built in stone with a surrounding wall of the same material. Further its name Wāra is noticeable. The word, which used to mean the residence of a king (*ari*), survives in the name of Wāra, the old capital of Wadai before Abeshr; and at Jebel Masa in the hills north-west of El Fasher, where are the ruins of another hill town and the local people call themselves Tungur Wāringa. Thus it is likely that Idrisi's Simia was on the Simiat hill now known as Jebel Wāra.²

In the text of Abu al Feda (d. 1332 A.D.) there is certainly an erroneous reading, Tajuwīn (تاجوين) having by the displacement of a pair of dots become Bajuwīn (باجوين)³. This author quotes Ibn Said (d. 1278 A.D.) as his authority for the statement that 'south of the Zaghawa of Kanem are the nomad tribes of the Zaghawīn and the Bajuwīn (*sic*)

¹ Nachtigal. *Sahara und Sudan*. III. p. 179; and Lejean. *Voyage aux Deux Nils* (1860-64). Paris. p. 102 and map XIII.

² Palmer (*Sudanese Memoirs* II. p. 12) reading سمينه thinks that it stands for a well-known site called Samina near Lake Fitri, but there seems no reason for thinking that the power of Nubia reached as far from the Nile as the region of Lake Fitri. Nor is Semna on the Nile south of Wadi Halfa likely to have been destroyed by the Nubian Lord of Philae. The reading سميه thus seems to me more attractive than سمينه. Both occur in the MSS.

³ *Taqwim al buldan* p. 158. This misprint misled Barth, See *Travels* III 426, n.

spread over the area of the bends of the Nile.¹ They are one tribe except that the Bajuwiin are of a better appearance and breeding than the Zaghawiin'.

Ansan² (d. 1327 A.D.) repeats Ibn Said without the misprint that occurs in Abu al Feda, when he writes of 'the city of Taju, whose people are as good and beautiful as in Zaghawa, of the lands of the blacks, the people are ugly and savage'.

Ibn Khaldun (d. 1405 A.D.) may again be repeating Ibn Said when he says that 'east of Wangara and Kanem are the lands of the Zaghawa and the Tajuwa (or Tajera) contiguous with the land of the Nuba'; and elsewhere he definitely quotes Ibn Said as saying that the Zaghawa were a Muslim people, one of whose tribes was called Tajuwa.

The combined effect of the above quotations is to render it highly probable that the Daju of tradition were the Tajuwiin mentioned by the Arab writers Idrisi and Ibn Said between 1153 and 1278.³

It will be noted that Idrisi distinguishes the Taju from the Zaghawa of Kanem; and describes them as pagan blacks but possessing two cities. A little over a century later (c. 1278 A.D.) Ibn Said classes the Taju with some nomadic Zaghawa, differing from the Zaghawa of Kanem and living between them and the Nuba. He appears to say that the Taju were more civilized and less negroid than the nomad Zaghawa. It is quite clear that at this period there was no suggestion that the Taju were Arabs.

The scattered colonies of Daju in Darfur and Kordofan to-day are all sedentary and negroid in type. They have a tradition that their sultans moved from Darfur to Dar Sila on the south-east borders of Wadai. The present sultan of Dar Sila has a distinctly negroid appearance; yet it would be almost unprecedented in Africa for a purebred negro to have founded a sultanate, and the previous dynasty claimed Arab origin (Kinana). There is however a little linguistic evidence as to who the early Daju were. The Sila Daju call all Daju, when speaking of them generally, and including

¹ It was a common idea among medieval geographers that the Nile came from Lake Chad, where it flowed from west to east; hence it had to bend until it flowed north from Nubia to Egypt. As the geography of Kordofan and Darfur was less well-known than that of any other part of Africa in the middle ages, the expression 'the area of the bends of the Nile' may well cover Wadai, Darfur and Kordofan. We may be sure that there were no pastoral nomads in the swampy forest country to the south of Kanem.

² *Loc. cit* p. 241.

³ Jos. Marquart. *Die Benin Sammlung*. p. cxii, agrees that in view of the information about the Daju given by Nachtigal there can be no doubt that they are the pagan Tajuwiin mentioned by Idrisi.

those of Darfur or Kordofan, 'Bokorigi' (s. Bokornichi), and they call themselves 'Bokorigi Sila-ningi' (s. Bokornichi Silanichi).¹

The Darfur Daju call themselves 'Finingi'², while they are called 'Feringi' by the Daju of Sila. These latter however, do not speak of the 'Bokorigi Feringi,' but of the 'Daju Feringi,' and similarly they call the Kordofan Daju not 'Bokorigi Sileichi' but 'Daju Sileichi'. (This looks as if the name Daju is historically confined to Darfur and Kordofan, and was not originally taken with them by the Daju who went to Sila). The name Bokorigi is probably connected with the Berber root MGR meaning 'great'. *Bogei* now means 'sultan' in Daju, but compare : *bogurei* or *bogadei* = 'chief' in Daza (Tibu).

mugur = 'sultan' in the language of the neighbouring Birgid.

miggir = 'sultan' in Bedanga.

mogur = 'bull' in Abu Sharib.³

M and B are frequently interchangeable in the Sudan, and I suggest that Bokorigi may mean 'the people of the sultan', and that Feringi is the equivalent of Fira ningi, and may mean 'the subject people', being very like the word 'Fur' in origin and probably connected with *firga* = 'servants' in Daza. The Daju now explain the name Feringi as meaning 'the people who got separated' deriving it from the Arabic *firr* 'to scatter' or *farag* 'to separate', but since they say *kigeinini* means 'we have separated' in Sila Daju, the popular explanation cannot be the correct one.

One finds when one travels about Darfur that there may have been more of an overlap of the Daju and Tungur spheres than MacMichael imagined. He himself admits the overlap in the neighbourhood of el Fasher.

Inside an area bounded by a line drawn from the northern end of Jebel Marra to a point about twenty-five miles north of El Fasher, will be found to-day most of the people claiming Tungur descent and most of the ruins

1 They do not call themselves 'Koska' as stated by MacMichael. (*History*. I.p. 75.n.) *Koska* only means 'we' in their language.

2 I see no reason to connect this with the Fung, as MacMichael does. I do not know what it means unless it means 'black people' and has some connection with *Pi* = black in Jukun. See Meek, *A Sudanese Kingdom*, pp. 5 and ? 18. This work records a Jukun tradition of a connection with the Daju. *bi* also means 'black' in Zande.

3 *Mugor* in the Nubian of Dongola and Mahass means 'antelope' (*Sudan Notes and Records* III. 270). Can there be any connection with the legend that the move of the Daju dynasty was due to the presumption of a Daju monarch, who insisted on riding on an antelope, and so got 'carted' from Darfur to Dar Sila? The Jukun on eastern Nigeria have a similar tradition of their kings riding antelopes. (C. K. Meek, *A Sudanese Kingdom* p. 50.)

of stone buildings attributed to the Tungur. There is also another area round Jebel Hereiz to the south of the Fasher plain, which may represent a colony of Tungur deported from their original homes by one of the Fur sultans, for it seems that after the establishment of the Keira dynasty attempts were made by the Tungur to recover power.

MacMichael states ¹ that it is beyond all doubt that the Daju never held any power in Jebel Marra, nor in the Fur sphere north-west of it. But at the edge of the foothills of Jebel Marra on the north-east near Dobo ² is a mound of about thirty-five feet radius and about six feet high, which is said to be the grave of a Daju sultan.

In the south-east part of the Marra range according to the Umangawi Hasaballah Suliman, the chief of that area, there is at Nari, within sight of Kedingnyir, a stone ruin said to have been the house of Kassi Furok, a Daju sultan. The Umangawi described it as indistinguishable from any of the other ruins which abound in Jebel Marra and which are usually attributed to the Tora. To some of the Fur of this area, the Miri, is attributed a Daju origin. ³

And at the extreme southern end of the range on the saddle of Jebel Keima about thirteen miles NNE. of Kalokitting is the rough stone enclosure usually attributed to Kusbur, the first of the Daju sultans. The methods of construction of the walls is that usually attributed by the Fur to the Tora, i.e. they are of dry stone masonry, faced and rubble-filled. The lay-out of the enclosure is a rough oval ; it is about forty-five yards long by twenty yards wide, with the maximum diameter running in an east-west direction. The enclosure is divided by a wall similar to the external walls (about six feet thick). In the eastern half are only two circular stone huts on the south side of an open space, while in the western and larger half there are a number of roughly circular stone huts partly dug out of the hill side. The condition of the stone walling is much more ruinous than that of the sites on Turra to which reference will be made later ⁴, and gives the impression of being undoubtedly older than the Turra palaces, even when allowance is made for greater rainfall at the southern end of the range.

The best Fur authority at Keima to-day is doubtful whether this ruin should be attributed to Daju, Tungur or Fur sultans. It is generally known as the palace of Kusbur and the Keima wiseacre said it had been the

¹ *History* I. 76 n.

² This grave was first reported by Nachtigal, (III. p. 358).

But as the name of the locality is wrongly spelt, and the grave is by no means sigs. well known as it was apparently in 1874, I had considerable difficulty in traction

³ MacMichael. *History* I. pp. 98.99.

⁴ See also *Sudan Notes and Records* XX pp. 91 ff.

seat of Bugur, Kusbur, Dali, Tunsam and Kuru. Kusbur is frequently said to have been the first of the Daju sultans in Darfur, and Bugur sounds like his title, vide the dissertation on Bukorigi above (pp.)

There would therefore seem to be some material evidence in support of the Sila tradition recorded by Nachtigal that the first six Daju sultans ruled in Jebel Marra. And in this connection it seems reasonable to suppose that the four (? five) barrows on the highest peak of the Marra range, which rises to over 10,000 feet and looks down on the crater containing the Deriba lakes, are more likely to be the graves of early Daju sultans than those of the sons of Alexander the Great (Dhu al Qernein) and their dog, to whom they are attributed by the local Fur to-day.

NOTE.—These barrows are objects of pilgrimage to the Fur. They appear to be not dissimilar in construction to the Dobo barrow already mentioned, and it is not surprising that they are smaller in view of their eerie situation on a mountain top. They lie in two groups about ninety yards apart. The two eastern-most appear to be roughly oval, while the two to the west are roughly circular. They vary in maximum diameter from fifteen to twenty feet. All have been damaged by pilgrims, who crawl round each barrow in turn on their hands and knees, and extract soil (to mix with water and drink). Offerings of food and drink are frequently left. Near the western barrows are two graves of normal size also the object of pilgrimage and circumambulation, one of which is attributed to the dog, but which are probably the graves of pilgrims, who have succumbed to exhaustion and cold. This is certainly the origin of another grave of ordinary size and recent date.

There is a widespread tradition in the Muslim Sudan that Alexander the Great travelled through the country until he reached the west coast. This is no doubt attributable to the account of Dhu al Qernein given in Sura 18 of the Quran, where it is said: 'We established his power upon the earth and we gave him a means to accomplish every end: so he followed his way, until, when he reached the setting of the sun, he found it to set in a miry fount.' It is reasonable to suppose that the pilgrimage to these barrows was an established custom with the Fur long before they heard of Islam, and that some Fur divine has invented this story to justify an old and valued custom. The fact that they make their pilgrimage to the grave of the dog as well as to those of the sons of Alexander the Great is perhaps another clue to the pagan origin of this pilgrimage.

I do not lay any stress on the points that follow, because I am not in a position to prove what appear to me their possible implications, but it is interesting to note that there is a colony of 'Fur' in Western Darfur to whom is attributed a Daju origin.

The people of Dar Nyoma have no tradition of their ever having lived anywhere else, for the present chief (*shartai*) is said to be descended from a man called Nang who had no parents but was found at the root of a millet plant (*nang* in Fur). Further we shall see that the most usual title of the governor of the northern quarter of the kingdom under the early sultans was the *Tokonyawi*. There is no reasonable explanation of this name except that it is an arabicized form of the Daju word *togoinyi*, now usually reserved as a form of respectful address for wizards—e.g. those who claim

to control locusts (usually known in Darfur as *dumbari*), or those who perform other pagan customs. Compare the Tongingi, or Togoingi a section of the Sila Daju, who are in charge of the pagan 'customs' celebrated at the accession of the Sila sultan. The word *togoin* is used in the Fur language with similar meaning. And although the present *Tokonyawi*, who claims Tungur descent, belongs to a family that has held the rank for a number of generations, there are traditions of a time when it was not held by his family, and it is possible that the name *Tokonyawi* is a survival of the time when northern Darfur also was included in the Daju sphere. Further support for such a theory may be found in the fact that the sultans of the Tama, on the western boundary of northern Darfur, and the sultans of the Zaghawa Kobe in the same area, are said to be Daju in origin. The ancestor of the Kobe sultans is said in one Zaghawa tradition to have obtained the *nahas* (copper drums \equiv royal crown) of the Mira sultan when the latter was a fugitive from Dar Zaghawa. We have noticed that to the Miri of the Umangawi's district in south-east Jebel Marra is attributed a Daju origin. I am informed by Mr. A. C. Beaton (formerly A.D.C. Western Darfur) that there are also Daju Mirenga in Dar Suro in western Darfur. It is just possible therefore that the Zaghawa Mira, who still share the accession rites at the appointment of the *malik* of DarTuar in Dar Zaghawa, and who are called Mina in Zaghawa, may be connected on the one hand with the Daju, and on the other with the Mima; to the latter are attributed the numerous stone cairn graves in the north of Dar Zaghawa, and they are said to have occupied the country before the present inhabitants, (who are mostly of Bedayāt origin).

These Mima are said to have moved south-west into Wadai, where a colony of them still exists. There Nachtigal noted their similarity to the Zaghawa, with whom they were intermarrying.¹ As a result of one of the historical wars between Darfur and Wadai, part of the Mima were deported from Wadai and settled in eastern Darfur, where both Tunisi² and Nachtigal mention that they had a sultan of their own who was tributary to Darfur. There they gave further trouble in the Mahdia, and were decimated by the Egyptian Government. In Wadai the Mima speak a language of their own, but in Darfur they only speak Arabic. Their present chief (*shartai*) whose features are distinctly non-negroid, claims a Bani Ummaya origin, but it is probable that the Mima sultanate dates back to before the coming of the Arabs to Darfur. The Mima are looked on as pre-Arab by present-day Zaghawa tradition; and the names of some of their sections in Darfur—

¹ *Sahara nd Sudan* III. 219.

² *Voyage au Ouaday* pp. 245-8.

Nanku¹ the royal family, Fira the soldiers or followers of the sultan, and Armi Kowamin² the people who advise the sultan and appoint his successor, —apparently indicate a Berber rather than an Arab origin for the Mima sultanate.

We shall also see when we come to examine the brands of the non-Arab peoples of Darfur that the basic brand of the royal families of the Daju, Tungur and Mima is the same for all.

(To be continued.)

1 Cf. *na* = 'sultan' in Berti and *Kwa* = 'people' in Fur. Presumably the name means sultan's people.

2 Cf. *Kam* = 'person' and *ni* = 'sultan' in Kanuri. For the *Kamni*, an old Darfur rank see later.

ملخص

هذه هي المقالة الاولى من سلسلة مقالات تبحث في تاريخ دارفور اثناء الفترة بين سنة ١٢٠٠ الى سنة ١٧٠٠ ميلادية وفيها يورد الكاتب اسماء كل القبائل التي تسكن دارفور الآن ثم يستعرض القدر المعروف في الوقت الحاضر من تاريخ دارفور القديم مستندا على مراجع براون ، محمد عمر التونسي ، بارث ، ناتشيجال وغيرهم واخيرا على الاستنتاجات التي توصل اليها السير هارولد ماكمايكل وبعد ذلك يستطرد الكاتب في بحثه الى قبيلة الفور ويتناول اصلهم ويقارن اسم هذه القبيلة مع كلمات مشابهة في عدة لغات حيه في اواسط افريقيا ويتوصل بهذا الى الاستنتاج بان الفور كانوا السكان الاصليين لهذا الصقع وكانوا تحت سيطرة مهاجرين من البربر ذوي البشرة الفاتحة ويرى الكاتب ان هؤلاء هم الداجو.

THE SUDANESE CAMEL GIRTH IN DOUBLE WEAVE

By Grace M. Crowfoot

During our happy years in the Sudan my husband and I were living mostly in Khartoum and therefore near enough to Omdurman to visit it frequently, though in those days there was no bridge and one had to go over by one or other of the river ferries. On those visits I watched workers at many interesting crafts, the weavers, the potters, the makers of stools and bedsteads and their patterned rope seatings, the carvers of coffee mortars, the makers of gay plaited mats and workers in ivory and silver. But besides all the things that I could see in the making there were others sold in the market or seen in the houses of friends or spied in passing, which used to intrigue me, black pottery from the Nuba mountains, carved wooden bowls from Kordofan, fine leather work from Dongola and even more delicate work from the South — all these and many another beautiful thing I wished to see coming forth from the hand of the craftsman. And of all the things I saw which were not made in Omdurman the fine patterned camel girths which I saw on rare occasions intrigued me most, for no one seemed able to tell me where they were woven, nor could I guess how they were made. They appeared to be in some kind of double weave, with the design in reverse, that is, wherever the pattern was white on the front it would be black at the back, and vice versa. How, I wondered, could such a texture be achieved on the primitive looms known in the country? Indeed, it looked as if it must have been woven on the most primitive of them all, the "Beduin" ground loom descended from the Ancient Egyptian loom, used in the Sudan for the making of *shamlas* (rugs), blankets and such like.

I knew that in the western desert of Egypt tent pieces were woven in pattern and I had seen the beautiful adaptations of these — the Amria rugs — woven at Burg el Arab on the Alexandrian coast. There under the shady arcades surmounted by a clock tower, near the Arab Court House, the women refugees who had been helped by Miss Baird during the first world war to develop a rug industry¹, plied their craft. I have three of their lovely blue and white rugs in my house now. The loom these weavers used was a more solid affair than that of the Sudan, but quite as simple,

¹ This industry was later continued under the care of Miss Violetta Thurstan and is briefly mentioned in her book *Decorative Textiles and Tapestries* (1934).

with four posts, two beams, a rod heddle and shed rod, two beaters i.e. the gazelle horn and wooden sword, and a stick spool for the weft. They could make two kinds of pattern, a twined weft weave used for cross bands and centrepieces, and a warp pattern used for long vertical bands. The latter was obtained in this way : in the part of the web destined for pattern the warp was set up double, e.g., blue and white, or fawn and white. (See fig. 1). The weaver chose the threads needed for the pattern, one from each pair, made her throw of weft and let the unwanted threads fall and float at the back of the rug¹. But though I saw and admired this simple and clever way of making the pattern I saw no double weave there, and how it could be woven on that loom I could not imagine. All I could do was to persevere in my enquiries.

I remember one big disappointment. One day one of the donkey boys in Omdurman told me that he had found what I desired, that an old woman was weaving a camel girth outside the town and if we hurried we should see her. Off we rode across the waste in the searing sun to a tiny encampment where an ancient dame was weaving a camel girth in a nice check pattern but alas ! in plain weave. On the way back, the boy, sensing that I was not exactly pleased with him, explained that I ought not to be angry with him for he had not understood the kind of patterned girth that I needed. It was a kind, the old weaver had told him, made by people who lived a long way off, but if they did visit the town one day he would let me know,— a day which never came.

At last, one day when we were visiting at Burri, the late Sharif Yusuf al Hindi, hearing of my desire, most kindly presented me with a camel girth in red and blue, better than any I had yet seen² and told me that it had been made by a woman at Abu Deleig, in the Butana. "Some day" said I "I shall hope to visit that place and see the weaving". "Would it not be better if she came and you could learn from her here?" was the reply. This was more than I had dreamt of as possible but it came to pass ; after some time word came from the Sharif, (March 5th 1924) that the weaver had arrived and I hurried over to Burri. Sitt Zeinab, of the Batahin, had travelled five days on a camel, sitting on an *angarib*, with a kind of mat canopy over her to keep off the sun, and she was weary, but full of spirit and ready, she said, to teach me her craft. (See plate I.A.) By

¹ The Western Desert method described here of obtaining a warp pattern is identical with that used in making the black and white patterned strips on tents in Transjordan. See *Palestine Exploration Quarterly*, April, 1945, p. 34 *et seq.*

² This fine girth is now in the Bankfield Museum, Halifax.



PLATE I.

- A. Sitt Zeinab, the weaver, arriving at Burri.
- B. Spinning yarn, Khartoum.
- C. Warping the camel girth.
- D. Making a rod heddle for the horse girth.

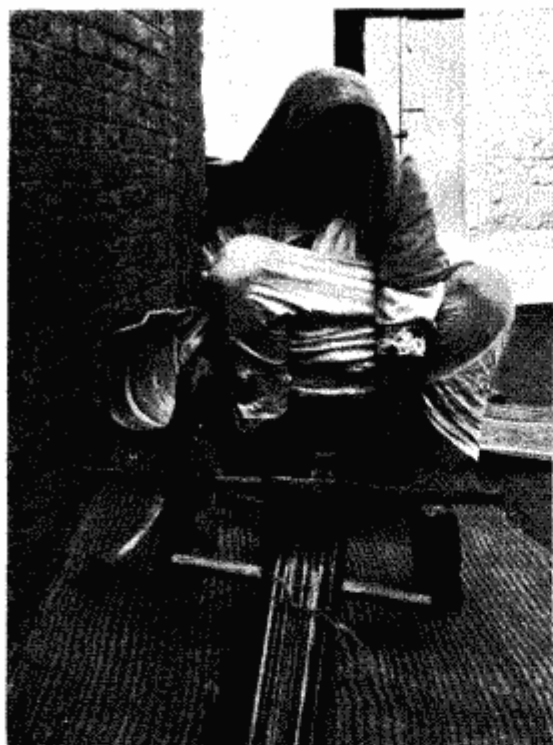


PLATE 2.
Weaving the camel girth.

- A. Weaver choosing pattern threads from those on the heddle.
- B. Weaver raising the shed rod threads.
- C. Weaver choosing pattern threads from those on the shed rod.
- D. Weaver raising heddle threads.

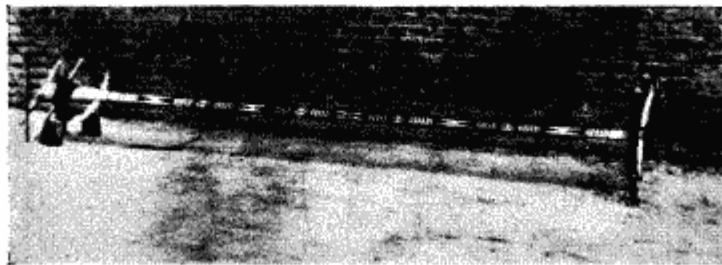
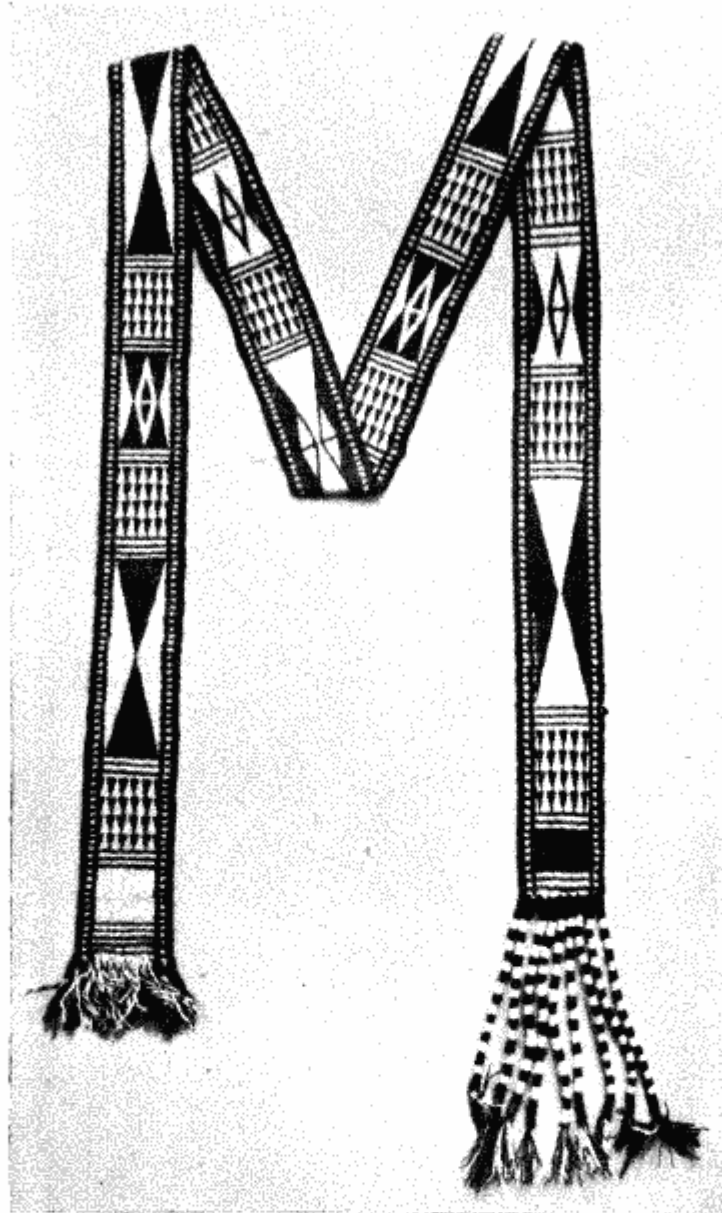
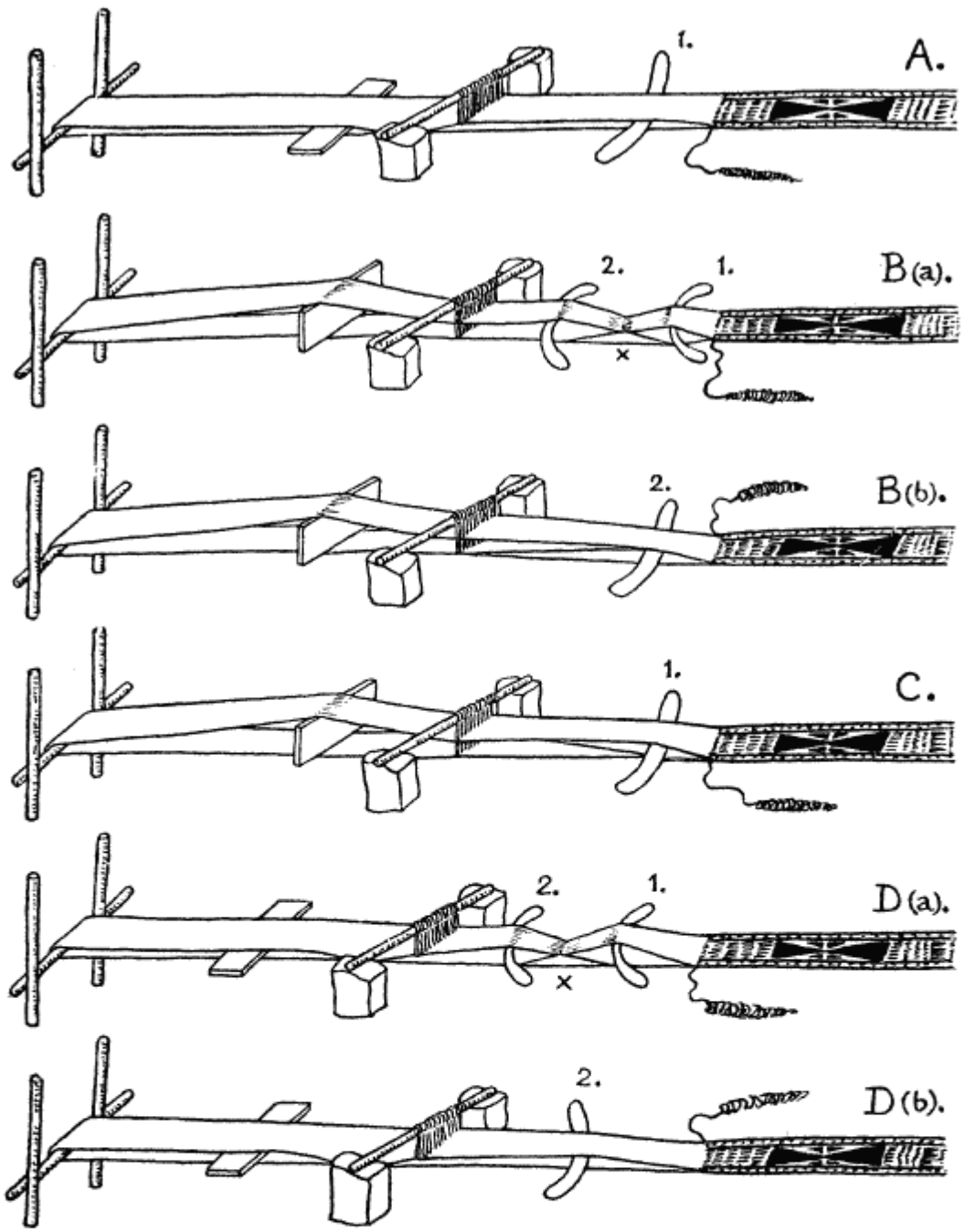
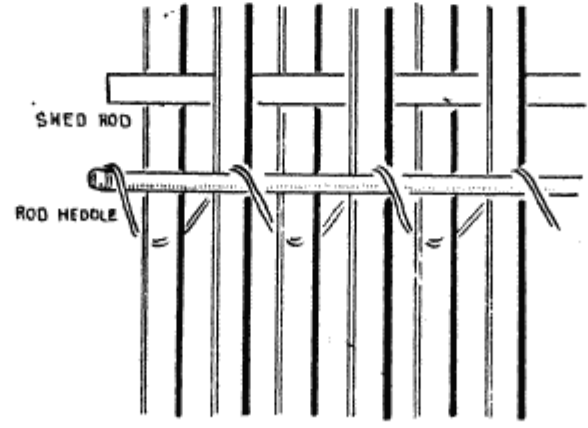


PLATE 3.

- A. Camel Girth in black and white made at Khartoum by Sitt Zeinab and her pupils, March 1924. Length 7ft. 5in. exclusive of fringe, width 3in.
- B. Camel girth, finished, on the loom .



BEDUIN WEAVING



WARP THREADING FOR
WARP PATTERN WEAVE

the kindness of Sheikh Mohammed Ahmed, then Headmaster of the Khartoum School, an arrangement was made for her to stay at his house in Khartoum so that I could visit her easily, and lose no detail of the work. "But first" said Sitt Zeinab "the yarn must be spun, for I made haste and came when the Sharif called me and I had no yarn ready by me. But I have brought goat's hair with me and when I have rested I will spin it for you." So for the first few days of her visit she span and the friendly ladies of the house, Sitt Husna and her daughters, themselves fine cotton spinners, helped to prepare and tease out the goat's hair so that we might come more quickly to the weaving. The spinning itself was delightful to watch. The spinner sat as seen in plate I.B., with the teased goat's hair weighted down by a stone and she twirled the spindle in her right hand while she controlled the growing thread with her left, easing out the hair from under the stone, drawing, or checking the spin as required. This method is called 'rotation in the hand' and is usual in the Sudan for wool: the spindle is not dropped to revolve in the air as in cotton spinning but remains in the hand throughout.¹ We all tried our hands at it but I for one had not mastered the method before the moment came when Sitt Zeinab declared that all was ready and we could begin to warp the girth.

The loom was pegged out in the courtyard. At first two posts were knocked in at one end with the breastbeam behind them, and one post only at the other. (This was a temporary arrangement for the warping only, later another post was added to it and the warp beam placed behind them.) Then Sitt Zeinab walked up and down carrying loops from the balls of yarn, (that is, two black balls for the borders and one black and one white for the centre) round the post to make the warp, while Sitt Husna's daughter looked after the crossing which she made between a stick and the breastbeam. (See plate I.C) The warp was thus laid double throughout. When the warp was on, two stones were found for heddle jacks, a rod laid on them and the heddle was made by lashing half the warp threads to it with a length of yarn, then the shed rod was put in to hold the other half of the threads behind the heddle, just as is done on the 'shamla' loom². But as the warp was double, each heddle loop held two threads, and there were two threads matching them on the shed rod, all black for the borders and black and white in the centre. (See Fig. 1)

¹ G.M. Crowfoot. *Methods of Handspinning in Egypt and the Sudan*. Bankfield Museum . p. 10.

² See *Sudan Notes and Records* Vol. IV Part 1.

On Tuesday March 16th the loom was ready and with a "*Bismillahi*" (invocation of God) Sitt Zeinab settled herself down on the mat with her spool of weft and a pair of camels ribs and began to weave. She took the heddle threads and chose the half required for the pattern and made a hrow of weft exactly as any Amria weaver would have done but what thappened after that was new and astonishing. After beating up the weft with one of the camel's ribs she left the rib in position in the shed. Next she raised the shed rod threads, placed the second rib in the shed and turned both ribs on edge. This forced the "floating" threads to fall lower and make a clear back shed through which she passed her weft. The first rib was then removed, half the shed rod threads chosen to make the pattern and the weft passed through the front shed. Again the rib was left in the shed, the heddle threads raised, the second rib put in that shed, both ribs turned on edge and the fourth and last shed gained and filled with weft. The secret of the double weave was revealed, surprising in its simplicity but how could one have imagined the function of that pair of camel ribs? It was easy now to understand why the pattern was in reverse, for wherever two threads of different colours were set up, here black and white, if the black was chosen for the face of the girth the white one would automatically appear on the back. The diagram on Plate 4 makes the process clear when studied with the text and the photographs on Plate ¹.

To learn the method I followed the whole making of the girth, weaving pieces myself at intervals. What happy mornings we had weaving in the courtyard while the air was still cool! Besides myself, the daughters of the house joined with zest in the learning and often two of my daughters, then staying in Khartoum, were of the party. Under Sitt Zeinab's eye the pupil of the moment would absorbedly pick up the warps as directed and watch the patterns unfold. One of my worst troubles was the attitude necessitated by the loom on the ground. I wished to kneel instead of squatting and this was regarded with reprobation, and another difficulty was the twisting of warp threads when selecting those needed for the pattern. Now why did I get this bother while my teacher's warps lay tidily side by side — always my fellow pupil fared better than I. "Look, look" said the *mu'allima* (teacher) "can't you see the place of the thread?" "What am I doing wrong?" cried I, but she just went on telling me to look till I could see it, there was no other way, and by degrees my "sight" improved and the twists became less frequent.

¹ For tools, in addition to the camel's ribs, one of which served as a beater, the weaver had a wooden pin, to pick up the pattern threads as required.

On Thursday March 27th the camel girth was finished and we took it off the loom (see plate 3). Sitt Zeinab, pleased and proud, with her mission accomplished, began to think of home. But before she left, to make sure that I had lost nothing of the earlier processes, we pegged out another loom in the garden and wove part of a horse girth. As the loom was so small this time there was no need to walk up and down, and Sitt Zeinab and a great friend of mine, Sitt 'Aisha, sat and warped it at their ease. The making of the heddle is shown on plate. 1.D ; Sitt Zeinab is lashing the warps to the rod while Sitt 'Aisha leans forward to help : we took the weaving quietly too this time sitting in the cool shade of the garden, a little at a time, for the weather was getting hotter every day.

At last the time came for goodbyes and last counsels. Except for my stupidity over the twisting warps, I was considered a good pupil, and at the end, like an apprentice, was bound over never to sell a camel girth at less price than my mistress. Then I learnt that a coloured girth, like the fine one presented to me by the Sharif, was worth more than a black and white one, and I thought the reason for this would be the labour and cost of dyeing and asked which dyes had been used. To my surprise, Sitt Zeinab told me that the red yarn had been made by unravelling certain German shawls imported into the country, and respinning and doubling the thread thus obtained. The origin of the dark blue yarn was even more curious. There is to be seen in materials woven in traditional lengths for the Sudanese market an unwoven portion at one end. Occasionally the material is cut and the bare warp ends are left as a fringe, but they are more often regarded as waste. Now Sitt Zeinab had a relation who was a merchant at Kassala, and he saved for her all the unwanted ends of a blue serge reputed to come from France, and these short lengths of thread she respun and doubled. By these means she obtained the fine red and dark blue wool for the best of her camel girths.

When the end came to all our pleasant labours, and the business side of our relationship had also been concluded, I asked Sitt Zeinab if there was anything that she had seen in the *suq* that she would like as a parting gift and she chose a large glass jar in which to keep her small treasures. To me she gave a pair of camel's ribs, highly polished, which I still keep and prize.

PLATE 4

A. First Throw. Front Shed. Shed rod flat

The heddle threads are raised and held by beater No. 2. Half these threads are chosen, beater No. 1 inserted, beater No. 2 removed, a throw of weft made and beaten up and beater No. 1 left in position in the shed.

B. Second Throw. Back Shed, Shed rod raised.

- (a) The shed rod threads are raised and Beater No. 2 inserted. Both beaters are turned on edge. Result, rejected half of heddle threads fall and make shed at X.
- (b) Beater No 1 is removed, inserted at X, a throw made and beaten up, Beater No 1 is then removed and Beater No. 2 left in position

C. Third Throw. Front Shed. Shed rod raised.

Half the shed-rod threads are chosen, Beater No 1 inserted, Beater No 2 removed, a throw made and Beater No 1 left in position.

D. Fourth Throw. Back shed, Shed rod flat.

- (a) The heddle threads are raised, Beater No. 2 inserted. Both beaters are turned on edge. Result, the rejected half of shed-rod threads fall and make shed at X.
- (b) Beater No 1 is removed, inserted at X, throw made and beaten up, Beater No 2 is left holding heddle threads in preparation for A.

ملخص

كانت الكتابة في يوم من الايام من سكان الخرطوم وهي تصف في مقالها هذا الطريقة المتبعة في السودان لنسج احزمة سروج الجمال كما شاهدتها عيانا في عام ١٩٢٤ لدى سيدات من حاشية المرحوم الشريف يوسف الهندي في داره .

NUER SPOKESMEN.

A NOTE ON THE INSTITUTION OF THE *RUIC*.

By B. A. Lewis.

In the following note I have attempted to evaluate the importance of the position of the *ruic* in the tribal structure of Nuer society because I believe this to be the only significant omission in Professor Evans Pritchard's brilliant analysis of the Nuer political system in his book *The Nuer*, (Clarendon Press, Oxford, 1940). If it is an omission it in no way invalidates his conclusions on the structure of Nuer society, although an understanding of this institution helps to explain the connection between the war leaders who led the Nuer tribes eastwards during the last century, and the prophets who later focussed and to some extent, symbolised in their persons the Nuer's resistance to Arab and European aggression from the north.

It is indeed surprising that no review of this book has ever appeared in *Sudan Notes and Records* particularly when it is remembered how many articles have appeared from the author's pen in this journal. To those who have served in Nuerland it is clear, when reading it, that his description of the modes of livelihood and political institutions of the Nuer applies more particularly to the Lou tribe, amongst whom he spent most of his time, than to the other Nuer tribes. Since his investigations were made soon after completion of the military operations known as Nuer Settlement, this is most understandable, and I, for one, have always been astonished at the amount of information he contrived to collect in such a short time when conditions in Nuerland were so difficult.

His second book, on Nuer marriage and kinship, is shortly going to press. When this is published, and also Mr. P.P. Howell's recently finished study of Nuer Law, this tribe which was one of the last in Africa to be brought under effective administration, will have become one of the best documented tribes in the whole continent. In certain respects Professor Evans Pritchard's book is a landmark in the development of African sociology. By writing it in the way he did, he broke away from the old tradition of lengthy monographs. He attempted to describe the political institutions of a very primitive people who, in fact, possess very little in the way of political organisation, in an abstract manner, and in relation to his

own theory of the social structure of such peoples. By social structure he means, in this sense, the relation between groups of persons who regard themselves as a distinct unit in relation to other groups, and which have a high degree of consistency and constancy. He himself admits the danger of doing this without first explaining the kinship system or describing their domestic life, and this shortcoming, if it is one, will be made good by the publication of his second book.

Any attempt to deal with the political structure of the Nuer is inevitably difficult because they possess so few political institutions. The tribes of Nuerland are independent territorial units and the relations between them may be said to be part of the political system. The Nuer explain the composition or structure of any one tribe in terms of a particular lineage which is dominant in that area. All Nuer tribes are split into segments; segments again are subdivided into sections which are frequently opposed to each other but combine together in opposition to more distant sections. The complementary tendencies of fission and fusion he regards as an essential factor in the segmentary structure of a stateless society such as the Nuer. The working of this principle is well described in Chapter IV, and is followed by a full description of the institution of the feud and of the settlement of disputes by the arbitration of the leopard skin chiefs.

Nobody could quarrel with these accounts or with his conclusions: it is only when discussing political leadership amongst them that I feel that Professor Evans Pritchard has not sufficiently emphasised the importance of the spokesman, *Ruic*, in Nuer society. He writes "The lack of governmental organs among the Nuer, the absence of legal institutions, of developed leadership and, generally, of organised political life is remarkable. Their state is an acephalous kinship state and it is only by a study of the kinship system that it can be well understood how order is maintained and social relations over wide areas are established and kept up. The ordered anarchy in which they live accords well with their character, for it is impossible to live among the Nuer and conceive of rulers ruling over them. The Nuer is a product of hard and egalitarian upbringing, is deeply democratic and is easily roused to violence. His turbulent spirit finds any restraint irksome and no man recognises a superior. Wealth makes no difference. A man with many cattle is envied, but not treated differently from a man with few cattle. Birth makes no difference. A man may not be a member of the dominant clan of his tribe, he may even be of Dinka descent, but were another to allude to the fact he would run a grave risk of being clubbed."

This is very true and follows his account of the *tut wec*, literally "the bull of the camp," who acts as the leader of a small social group, the

collection of related families which combine to form a joint cattle camp in the dry weather. Professor Evans Pritchard writes "In larger groups than village or camp there is far less co-ordination of activities and less scope for leadership. Only in war is there any lengthy direct co-operation. Men noted for their prowess and ability stir up among the youths enthusiasm for a raid against the Dinka or a fight against another tribal section, and direct what simple tactics are employed, but these men have no political status or permanent leadership .. Some of these warriors become renowned .. Two of the most famous war leaders were Latjor, who led the Jikany tribes, and Bidiit, who led the Lou eastwards. Neither had any ritual qualifications but both were men of outstanding ability who were members of the dominant clans of their tribes. It is not said by the Nuer that either established any political control or even had great authority in their tribes. The role of prophets in war is examined later¹."

Here I wish to point out that both Latjor and Bidiit were *ruic* of their tribes, as were the prophets Ngundeng and his son Gwek in Lou, and Deng Likea and his son Dwal Din in Garwaar, whose careers Professor Evans Pritchard records later on².

The word *ruic* is derived from the same root as *ruac* meaning 'speech, or 'talk', and a *ruic* is said to have *ruac*, which is perhaps best translated as 'influence', for 'authority' would be too strong a word for the very limited control these leaders were able to wield over their turbulent, independent tribesmen.

The Nuer say that a *ruic* depended, for his influence, on popular support and that he secured this by helping in the provision of marriage cattle, by seeing that compensation was paid in homicide cases, by ensuring that the tribe had enough to eat and, above all, by being an orator at once clever and eloquent. Anyone who has attended a Nuer meeting when some difficult question was under discussion will understand this. Everybody has his say, but certain individuals have the power of putting what everybody is thinking into simple words. When these individuals find the right formula for expressing the feelings of the group, everybody present agrees. The authority they exert, however, is slight, and their position so democratic, even today when reinforced by their position as recognised Government Chiefs, that I consider 'spokesman,' which retains the connection present in Nuer between *ruic* and *ruac*, gives the best English equivalent.

¹ This theory is further developed in *African Political Systems*, a Symposium edited by Dr. Fortes and Professor Evans Pritchard, published by the Oxford University Press for the International African Institute in 1940.

² *The Nuer*, p. 181.

The position of these *ruic* depended mainly on their own personalities. The possession of ritual powers helped, as did membership of the dominant clan ; wealth was a distinct asset, while physical strength and endurance, especially if allied to courage, were important qualifications, but in the final resort, it was a man's character and personality which decided whether his fellows would accept his leadership or not.

When a number of camps join together for a particular purpose they combine with those camps most closely related to them in the tribal structure. A tertiary section may, for a time, assume a corporate form by massing the fighting men of the group for a battle or raid. The camp leaders, *tut wec*, assemble and the outstanding man amongst them becomes their very unofficial chairman. He is the *ruic* of his section. When, as occasionally happened, all or most of the sections of a whole tribe joined together for some purpose, these sectional *ruic* assembled to decide the tribe's policy. If anyone of them was sufficiently outstanding to become recognised as *primus inter pares*, he was regarded by the Nuer as the *ruic* of the whole tribe. But the dividing line between a *tut* and a *ruic* was, and is, extremely difficult to draw, if indeed one should be drawn at all. The distinction between the two is almost entirely one of emphasis.

When discussing their past history with the Lou, it becomes clear that they regard several past heroes as having been *Ruic Louka* 'spokesmen of Lou.' Bidiit Kweinyang, who led them eastwards was the first ; Bec Colieth, who led them far into what is now Anuak country, and was in his old age carried back protesting to the waterless country they now inhabit, was another. He was a *wut gok*, 'cattle chief', and his family still possess the knife which is hung up ceremonially to mark the end of one age set and taken down at the beginning of the next. Yuot Nyakong, a leopard-skin chief, who made contact with the first Turkish troops for slave traders at Ful Turuk on the Filus, was the next ; then Ngundeng, a leopard-skin chief as well as a prophet and, finally, his son Gwek, who inherited his father's power. There were also sectional *ruic* and the presidents of the Courts set up by the Government in recent years are often spoken of as *ruic*, although they are more commonly referred to as *kwor buok*, 'chief of the book'. Once when I asked a group of people who was *Ruic Louka* today, they laughed and said "why, you are". They meant, of course, that by virtue of my official position as District Commissioner of the Lou, decisions which affected the whole tribe were made at meetings over which I presided and that the Government could not accept a leader in opposition to my authority. Today the Nuer District Commissioners have, to a certain extent, become part of the political structure, and if a Nuer visiting

Malakal is asked where he comes from, he will probably reply "O, I am so and so's man", giving his District Commissioner's bull name.

As we have noted, these *ruic* only attained to real political leadership in times of war, either by leading the Nuer to the conquest of new country from the Dinka or later in opposition to the threat of attack from the north by Arab slave traders or the Egyptian Government forces, and later still by the present Government. In Gawaar the first great *ruic* was Bwoogh Kerpel, who led the Gawaar across the Nile to conquer fresh lands from the Dinka. He is said to have been chosen as their leader by all the people and lifted up on high so that God should know he had been chosen. He also drank a gourd full of milk into which everybody had spat, a ceremony full of symbolism for the Nuer. After this ceremony he assumed the functions of a leopard-skin chief. Nobody could address him by his own name, Bwoogh, but only as Gat Kerpel, the son of Kerpel. He was ably supported by his brother, Teng Kerpel, and after their death Mer Teng in part succeeded to their position and became *ruic* of Radh Gawaar while Puol Bidiit was *ruic* of Bar Gawaar. Nuar Mer, the adopted son of Mer, in the third generation, made an infamous pact with the slave traders who captured Deng Likea's mother. In due course Deng Likea became a prophet, *guk*, possessed of the sky-spirit, Diu, and as he was enormously tall and a great warrior, he gradually became *ruic* of Bar Gawaar and eventually grew strong enough to lead an army against Nuar Mer, whom he defeated and killed. After that he became *ruic* of all Gawaar. His son, Dwal Diu, succeeded to his position and was greatly helped by Dag Mer, a younger son of Mer Teng, who led the Radh Gawaar contingent in Dwal's numerous raids against the Dinka of Bor District. When I first went to the Zeraf in 1935, Dag Mer, then an old man, was undisputedly the most influential man in all Radh Gawaar, and recognised as such by the Government. He died in 1937 and no chief has since been able to secure such influence as he possessed. In recent years Gow Bang, another son of Deng Likea, has been president of the Bar Gawaar Court, and for some years was undoubtedly the most influential man in the tribe. Another man who was regarded as a *ruic* in Bar Gawaar, was Liaab Leau of Cieng who was instrumental at one time in stopping fighting between Cieng Jamogh of Bar Gawaar and Cieng Dung of Lou.

In the Thiang tribe, Toi Thiep, a leopard-skin chief was *ruic* of the primary section, Bang, and used to take ivory as tribute to the Egyptian Government at Fashoda. His descendants are still very influential in Thiang where they belong to the dominant lineage. In the other primary section, Riah Kang Ngir was *ruic* as well as being *wut gok* for the whole

of Thiang and kept the knife used for the initiation ceremonies of new age sets. He was also guardian of the tribe's sacred spear, Mut Bah Thiang.

In the Lak Tribe, Padhur Geng was a very great *ruic*, although he was not a military leader. He was a leopard-skin chief and a *gwan wal*, 'possessor of magic' and his curse was greatly feared. The Kwacbur sing 'Padhor Geng ci Keahde rath Let mane Jaang'—'Padhur Geng's curse has reached the Let and the Dinka'. The "Let" are a mythical people like lions whom the Nuer believe live to the west of the Dinka of Bahr el Ghazal Province. The Winyang family have also provided *ruic* for Lak more recently and Kic Wur Winyang is now president of the Kwacbur court.

Amongst the Nuer Tribes of the Zeraf valley Bwoogh Kerpel and Padhor Geng are regarded as having been greater *ruic* in their time than Deng Likea, whose position in Gawaar at the turn of the century was comparable with that of Ngundeng in Lou. Deng Likea and Ngundeng were both prophets and their sons Dwal and Gwek were the leaders of Nuer resistance to the present Government which was only finally overcome by the Nuer Settlement in 1928-30, when Dwal was captured and Gwek killed.

In describing the emergence of the prophets, *guk*, men possessed by sky-spirits, as a recent phenomenon in Nuerland co-incident with Arab aggression, Professor Evans Pritchard is undoubtedly correct, but when he writes of them, 'For the first time a single person symbolised, if only to a moderate degree, and in a mainly spiritual and uninstitutionalised form the unity of a tribe, for prophets are tribal figures'¹ I believe he was mistaken. The Gawaar are emphatic that Deng Likea used his spiritual powers as a *guk* to help him to become *ruic* of Gawaar. Evans Pritchard further writes¹. 'The only activities of prophets which can be truly called tribal were their initiation of raids against the Dinka and their rallying opposition to Arabs and European aggression, and it is in these actions that we see their structural significance and the growth of their influence.' This is true in a sense, although many minor prophets never succeeded in becoming in any way tribal leaders, and the sentence would have been better if it referred to *ruic* rather than to prophets.

The same men, Deng Likea in Gawaar and Ngundeng in Lou, were at one and the same time prophets, leopard-skin chiefs and *ruic*, but it was in virtue of their latter position that they performed the few tribal functions they did, and their significance in the political structure depended on this. As Professor Evans Pritchard points out² there is some evidence to suggest

¹ *The Nuer*. p. 180.

² *The Nuer*. p. 185.

that the Mahdist movement in the northern Sudan may have been partly responsible for the emergence of the prophets. In any case, the aggression from the north was a more dangerous threat than anything else the Nuer had had to combat for generations, and called for greater combined efforts if it was to be resisted. These outstanding prophets supplied the necessary political leadership by filling the traditional position of spokesmen of their tribes, with the additional authority provided by their prophetic powers.

If the examples of past *ruic* given above are examined it will be noted that practically all of them were leopard-skin chiefs in addition to being *ruic*. In Gawaar, Bwoogh Kerpel and Deng Likea both assumed the functions of leopard-skin chiefs which their descendents inherited. In Gawaar and Thiang, important sections of the dominant lineages of the tribes are leopard-skin chiefs, although this is not the case in Lou or Lak. When Professor Evans Pritchard was first publishing his accounts of the Nuer in the series of articles in *Sudan Notes and Records*, his findings were criticised by Mr. P. Coriat, one time District Commissioner of Gawaar and Lou, who was the first official to speak Nuer. Mr. Coriat considered that Professor Evans Pritchard underestimated the importance of the leopard-skin chiefs in relation to the prophets. I believe their disagreement can be resolved if the significance of the *ruic* is taken into account. Leopard-skin chiefs have been far more important in Gawaar, where the important tertiary section, Ceing Kerpel, of the dominant lineage are leopard-skin chiefs, than in Lou where no leopard-skin chiefs belong to the dominant lineage. In so far as political leadership was ever vested in one man by a whole tribe it was vested in a spokesman who might or might not be a leopard-skin chief or a prophet or a cattle chief at the same time. The succession of political leadership in Lou from Bidiit Kweinyang, who was a minor ritual expert as well, to Bec Colieth, who was also a cattle chief, to Yuot Nyakong, who was a leopard-skin chief, and finally Ngundeng, a leopard-skin chief and the greatest of all the Nuer prophets, illustrates this well. There was no ordered succession from one to the other; sectional *ruic* existed all the time, but the individuals mentioned rose to tribal pre-eminence in meeting the needs of one moment in the history of the tribe, and so the emergence of the prophets led to no changes in the structure of Nuer society.

In conclusion I wish to acknowledg my debt to my former Nuer assistants, Buth Diu in Gawaar, Lak and Thiang, and Dag Dei in Lou. It was the latter who first brought the word *ruic* to my notice and translated it then as a speaker in the sense of ruler. Finally I must also thank Mr. P.P. Howell: we have discussed this institution so often that is now difficult to know exactly what one has taken and given, or what the other

contributed. I hope this note will encourage those interested in the Nuer to read his fuller examination of authority amongst them when it appears because the distinction between the *ruic* and the *tut* is largely one of emphasis, and so is extremely difficult to define exactly ; the more so because the emphasis probably varies amongst the different Nuer tribes.

ملخص

يشير الكاتب الى كتاب البروفسور ايفانسن برتشارد عن قبيلة النوير ويتناقشه في ان الصدارة لدى تلك القبيلة لا تنحصر في الرؤساء العاديين لوحدات ذلك المجتمع الصغير بل هناك ايضا زعماء اخرون يطلق عليهم الناطقون باسم القبيلة ولكن اهمية هؤلاء لا تتجلى الا في اوقات الحروب القبلية ثم اعطى الكاتب امثلة وبين مركز كل نوع من الزعماء بالنسبة الاخر .

RULERS OF SUDAN. 1820-1885

Compiled By R. L. Hill.

The publication of the following calendar of governors-general and provincial governors of the Sudan during the Egyptian regime needs an apology. These lists of names and dates are not, as the Philistine might suggest, an essay in pedantic virtuosity, but an attempt to fill in the biographical background for workers in the various aspects of the nineteenth century Sudan. We are still ignorant of much that happened during the Egyptian period and specially ignorant of the men who carried on the government during those sixty five years.

The Viceregal Government at no time issued complete lists of its chief officers and officials in the Sudan ; there was no equivalent of the *Sudan Government Gazette*. Consequently, while the list of governors-general is believed to be complete, the succeeding lists of other functionaries are fragmentary by reason of gaps in the records consulted. A valuable, if sometimes treacherous, guide to moves of personnel is a list of governors-general and provincial governors, 1820-77, with a supplementary list to 1882, extracted from the paysheet registers preserved in the Citadel, Cairo, and supplied to the Egyptian Ministry of the Interior in 1901. This document is not free of contradictory dates and, through recording names in shortened form (a vice throughout the Ottoman Empire) renders some identifications difficult to establish. An apparently complete, but in detail suspect, list of Egyptian governors of Berber Province is kept in the District Commissioner's office at Berber. Further examination of the Egyptian state archives will certainly lead to the addition of more names, and the correction of names and dates, given in the lists below. Readers of *Sudan Notes and Records* would greatly assist in perfecting the roll by kindly notifying errors and omissions to the compiler.

The dates of appointment and discharge here set out are (where available) the actual dates of assuming and ceasing duty, not the official dates given in the documents which are frequently subject to a considerable time lag.

The absence of *pasha* or *bey* with a name signifies that the person was addressed as *asha* or *efendi*. The grade appearing with a name is the grade held by the person at the time he occupied the particular post.

The names of those who died in office are followed by the sign.*

GOVERNORS-GENERAL

Commander-in-Chief (*Saraskar*)

- Ismā'il Pasha Kāmil, 1820-22 (Officer commanding troops, Sennar). *
 Ibrāhīm Pasha al Wālī, 1821-2 (Officer commanding troops, Sennar and Kordofan).
 Muhammad Bey Khusraw al Istānbūlī, called al Daftardār, 1822-4 (Officer commanding troops, Sennar and Kordofan).
 'Uthmān Bey Jarkas al Birinjī, 1824-5 (Officer commanding troops, Sennar and Kordofan).*
 Mahū Bey Urfalī, 1825-6 (Acting officer commanding troops, Sennar).

Governor-General (*Hikimdar*)

- 'Alī Khūrshīd Pasha (Governor, Sennar and dependencies, 1826-33 ; governor of the Sudanese provinces, 1833-5 ; governor-general, 1835-8).
 Ahmad Pasha Abū Widān, 1838-43.*
 Ahmed Pasha Maniklī (or Manliklī), 1843-5.
 Khālid Pasha Khusraw, 1845-50.
 'Abd al-Latīf Pasha 'Abd Allāh, 1850-1.
 . . . Rustum Pasha, 1852.*
 Ismā'il Haqqī Pasha Abū Jabal, 1852-3.
 Salīm Pasha Sā'ib (or Sāyib), 1853-4.
 'Alī Pasha Sirrī Arnā'ūt, 1854.
 'Alī Pasha Jarkas, 1854-5.
 Muhammad Pasha 'Abd al Halīm, 1855-6.

(Period 1856-62 : Governorate-General Suppressed)

- Mūsā Pasha Hamdī, 1862-5.*
 Ja'far Pasha Sādiq, 1865-6.
 Ja'far Pasha Mazhar, 1866-71.

(Period 1871-3 : Governorate-General Suppressed)

- Ismā'il Pasha Ayyūb, 1873-6.
 C. G. Gordon Pasha, 1877-80.
 Muhammad Ra'ūf Pasha, 1880-2.
 'Abd al Qādir Hilmī Pasha, 1882-3.
 Sulaimān Pasha Niyāzī, 1883 (Governor-general for military affairs).
 'Alā'al Dīn Pasha Siddīq 1883 (Governor-general for civil affairs).*
 Husain Wāsif Sirrī Pasha, 1883.
 C. G. Gordon Pasha, 1884-5.*

DEPUTY, VICE AND ACTING GOVERNORS-GENERAL

- Yūsuf al Arnā'ūt, 1834-5.
 Sulaimān Atū Dā'ūd, 1837.
 'Abd al Qādir . . . , c. 1839.
 Ahmad Hāshim, -1841.*
 Muhammad al Amīn Bey, 1841-c. 1843.
 Sulaimān Pasha . . . , fl. 1848.
 Khusraw Bey . . . , -1851.
 Ibrāhīm Bey . . . , 1851.
 Mūsā Bey Hamdī, 1851-5.
 'Abd al Qādir Bey . . . , 1853-4.
 Ilyās Bey Kirīdlī, 1854-5.
 Ibrāhīm Bey . . . , 1855.*
 'Uthmān Bey . . . , 1855.

'Ali Bey Fadlī, 1862-4.
 'Umar Bey Fakhri, 1864-5.
 Ja'far Pasha Mazhar, 1865-6.
 Muhammad Bey Hasan, 1875.
 Khālid Pasha Nadīm, 1875-6.
 'Abd al Rāziq Haqqī Pasha, 1876-7 (twice).
 Mustafā Pasha Murād, 1877 (?).
 'Uthman Rifqi Pasha, 1878.
 al Tuhāmī Bey Jalāl al Dīn, -c. 1879 (?).
 . . . Giegler Pasha, 1879-82 (twice).
 Husain Mazhar Pasha, 1883-4.
 H. W. R. De Coetlogon Pasha.

UNDER-SECRETARY, LATER MINISTER, FOR THE SUDAN

'Ali Pasha al Rūbī, 1881-2.

PROVINCIAL GOVERNORS.

BAHR AL-GHAZAL

District Officer (*Nazir al-qism*)

Muhammad al Hilālī, 1869-72.*

Governor (*Mudir*)

Zubair Bey Rahma Mansūr (I), 1873-5.
 Idrīs Abtar (acting), 1875-7.
 Sulaimān Bey Wad Zubair Rahma, 1877-8.
 Ibrāhīm Bey Fawzi, 1878.
 Sa'tī (or Sattī) Bey . . . c. 1878.
 Yūsuf Bey Hasan, 1879.
 R. Gessi Pasha (with the Equatorial Province), 1879-80.
 'Alī Mūsā Bey Shawqī (?).
 F. M. Lupton Bey, 1880-3.

BERBER

Governor (*Ma'mur, later mudir*)

Muhammad . . . (*kashif* of Halfayya), 1821-2.
 Mahū Bey Urfalī (governor of Berber, Halfayya, Shendi and the country of the Rubātāb), 1822-5.
 al Hājj al Amīn, 1825-7.
 'Uthmān . . . , 1827-8.
 Sālih . . . , 1829-
 'Alī . . . , 1829-32.
 'Abbās al Bazārī, called al Jundī, *fl.* 1832-5 ; 1836-8.
 Nihād Bey . . . , c. 1840.
 Halīf Bey . . . , c. 1840.
 Khusraw Pasha . . . (with Dongola Province), *fl.* 1843.
 Hilmī . . . (I), 1843.
 Muhammad al Amīn Bey, 1843.
 Hasan Bey Husnī, *fl.* 1846.
 'Alī Bey Hasib, 1851.
 Hilmī Bey . . . (II), 1854.

Ibrāhīm Bey Abū Filaija, -1857¹
 Mahmūd Bey . . . , 1857-9
 'Abd Allāh Bey al Wānī (with Dongola), 1859-62.
 Ibrāhīm Bey . . . , -1865.
 'Umar Bey . . . , 1865-
 'Alī Bey 'Uwaida, -1867.
 Ahmad Rāmī Bey, 1867-
 Husain Bey Khalifa, 1869-71.

General Governor (*Mudir 'umum*), with Dongola Province.
 Husain Bey Khalifa, 1871-3.

Governor (*Mudir*)

'Alī Bey Sharīf, 1874-5.
 Mustafā Bey Murād, 1875-8.
 Muhammad Sa'id Bey Wahbī, 1878.
 Ibrāhīm Bey al Sabbān, 1878-9.
 Muhammad Ma'nī Bey, c. 1879- c. 1881.*
 Fīrhād Bey Muhib, 1882.
 'Abd al Rahman Bey Fā'iz, 1882 (?).
 Ibrāhīm Bey . . . , 1883.
 Husain Bey Khalifa, 1883-4.

BERBERA

(Dependency of Harar)

Governor (*Muhafiz*)

Fīrhād Bey Muhib, 1883.
 'Abd al Rahman Bey Fā'iz, 1883-4.

DARFUR

General Governor (*Mudir 'umum*)

Hasan Hilmī Pasha al Juwaisar (with Kordofan), 1875-9.
 'Abd al Rāziq Haqqī Pasha (acting), 1877.
 Muhammad Pasha Imām al Khabīr, 189.
 F. C. Rosset Pasha, 1879.*
 G. B. Messedaglia Bey, 1879-80.
 'Alī Bey Sharīf, 1880-1.
 R. C. von Slatin Bey, 1881-3.

el Fasher

Governor (*Mudir*)

Hasan Hilmī Bey al Juwaisar, 1874.
 'Alī Bey al Ridā al Kūrdī, 1875-.
 Zakariyā Bey . . . , 1878-9.
 Sa'id Bey Juma'a, 1879-83.

1. Discharged by the Viceroy Muhammad Sa'id Pasha during the latter's visit to the Sudan, 1856-7, when Berber Province reverted temporarily to a Sudanese local administration under Nasr al-Dīn Abū'l Kailak, grandfather of the present Shaikh Ayyubey 'Abd al Mājid.

Dara.

Governor (*Mudir*)

- Mustafa Bey 'Abd Allāh, -1878.
 C. Rigolet, 1878-9.
 Muhammad Bey Khalid Zughal (acting), 1879.
 G. B. Messedaglia Bey, 1879.
 F. Emiliani dei Danziger, 1880-2. *
 R. C. von Slatin Bey, 1881.
 Muhammad Bey Khalid Zughal (acting), 1882.
 Qulqul and Kabkabiyya

Governor (*Mudir*)

- Muhammad Pasha Imam al Khabir, - 1879 (?).
 al Nur Bey Muhammad 'Anqara, 1879.

Shaqqa

Governor (*Mudir*)

- Ilyas Bey Umm Birair, c 1876.
 Sa'id Bey Husain, 1877-8.
 Mustafa Bey 'Abd Allah, 1878-9.
 C. Rigolet, 1879.
 Muhammad Bey Khalid Zughal, 1879.

DONGOLA

Governor (*Ma'mur, later mudir*).

- 'Abidin ('Abdi) Bey Arna'ut, 1821-5.
 Qasim . . . , 1825-7.
 Ibrahim . . . (?)
 Mahmud . . . , c. 1829- c. 1832.
 Husain Baghdadi, fl. 1830-1 (acting only ?)
 Hafiz Ibrahim, 1831-5.
 'Ali . . . , fl. 1837.
 Ahmad Shawqi, 1839-40.
 Hafiz 'Isa, c. 1839-40.
 Mustafa Bey . . . , (with Kordofan), c. 1840.
 Khusraw Pasha . . . (with Berber), fl. 1843.
 Hasan Pasha Ra'fat Asitanali (with half of Berber), 1843-6.
 Hasan Bey Husni (with half of Berber), 1846-.
 Khurshid Bey . . . , 1851-2.
 Husain Bey . . . , 1852.
 Mahmud Bey . . . , 1857-9.
 Ahmad Bashir al'Aqid (acting), 1858.
 'Abd Allah Bey al Wanli, (with Berber), 1859-62.
 'Uthman Bey, fl. 1866-70.

General Governor (*Mudir 'umum*)

- Husain Bey Khalifa (with Berber), 1871-3.

Governor (*Mudir*)

- Almās Bey Muhammad (I), 1873-5.
 Shahin Pasha Kinj (concurrently with General Managership of the Soudan Railway),
 1875.
 Almās Bey Muhammad (II), 1875-9.
 'Izz al Din Bey 'Ali (?).

Sir Mustafa Pasha Yawar, 1879-85.
Muhammad Jawdat, 1885.

EASTERN SUDAN

(See RED SEA LITTORAL)

EQUATORIAL PROVINCE

General Governor (*Mudir 'umum*)

Sir S. W. Baker Pasha, 1869-73.
Muhammad Ra'uf Bey (acting), 1873-4.
C. G. Gordon Pasha, 1874-6.
A. Mc C. Mason Bey (acting), 1876.
H. G. Prout Bey, 1876-8.
Ibrahim Fawzi Bey, 1878.
Muhammad Amin (Emin) Pasha, otherwise E. C. O. T. Schnitzer, 1878-88 (under general governor of the Bahr el Ghazal, 1879-80).

FAZUGHLI (THE FUNJ)

(Dependency of Sennar)

Ma'mur later Governor (*Mudir*)

Salim Pasha Sa'ib (or Sayib), 1843-.
Isma'il Bey . . . , 1847.
Salih Hijazi, - 1855.
Ibrahim . . . , - 1278 A. H. (-1861/2).

Governorate detached from Sennar and constituted an independent Province, 1869.

Muhammad Ma'ni Bey, 1872.
E. Marno Bey, 1881-3.

GALLABAT

(Dependency of Sennar)

Governor (*Mudir*)

E. Marno, 1878.

HARAR

General Governor (*Mudir 'umum*)

Muhammad Ra'uf Pasha, 1875-8.
Muhammad Ridwan Pasha, 1878-9.
Yusuf Bey Ahmad, 1879-80.
Muhammad Nadi Pasha, 1880-2.
'Ali al Rida Pasha al Tubji, 1883-4.

KHARTOUM

Governor (*Mudir*)

Mustafa Bey . . . , 1837-.
Musa Bey Hamdi (I), 1841-3.
Muhammad Amin Pasha Arna'ut (with Matamma, Shendi and dependencies, detached from Berber Province), 1843-4.

Hasan Pasha . . . , 1844-
 Musa Bey Hamdi (II), 1848-
 Ahmad Bey . . . , -1851.*
 Qasim Bey . . . , 1852-3.*
 Ahmed Bey (Shahin?), fl. 1856.
 Musa Bey Hamdi (III), 1858-9 (three months).
 Hasan 'Ali Bey Arna'ut, 1859-61.
 Ahmad Bey 'Awad al Karim Abu Sin, 1861-70.
 'Abd al-Raziq Haqqi Bey, 1870-3.
 Ahmad Bey Abu Zaid (I), 1874.
 'Ali Bey Fahm,i 1874 *
 Mustafa Bey Yawar, 1877-
 Muhammad Ma'ni Bey,- 1878.
 Ahmad Bey Abu Zaid (II), 1878-
 Mahmud Bey Ahmadani (?).
 Ahmad Bey 'Ali Jallab 1883 (?) - 1884.
 'Awad al Karim Pasha abu.Sin (appointed but did not assume office), 1884.
 'Ali Musa Bey Shawqi, 1884-5 *

KORDOFAN

Officer commanding troops (*Sar 'askar*)

Muhammad Bey Khusraw al Istanbuli, called al Daftardar (officer commanding troops, Kordofan), 1821-2.
 Husain al Kumuljinali (acting), 1822-4.
 Halim . . . (acting), 1824-5.

Governor and *Miralai* of the 1st Infantry Regiment

Sulaiman Bey al Kharbutli, 1825-7.
 Salim Bey . . . , 1827-8.
 Rustum Bey . . . , 1828-33 *
 Mustafa Bey . . . , 1833-7.
 Muhammad Bey al Murabit, 1837-9.
 Yusuf Bey . . . , 1839-41.
 Zuhrah Bey . . . , 1841-3.

Governor (*Mudir*)

Mustafa Pasha al-Kiridli, 1843-8.
 Musa Bey Hamdi, 1848 (?) - 1850 (discharged, reappointed, 1850).
 'Abd al Qadir Bey . . . , 1851-3.
 Muhammad al Amin Bey (I), 1854-
 'Uthman Bey . . . , 1856-7.
 Muhammad al Amin Bey (II), 1857-8.
 Hasan 'Ali Bey, 1858-63 (?).
 Muhammad Hilmi Bey, 1863-5.
 Ibrahim Bey . . . , 1865.
 Hasan Hilmi Bey al-Juwaisar (I), 1866-7 (?).
 'Abd al Wahhab Bey . . . , 1871-
 Muhammad Sa'id Bey Wahbi (I), 1874.
 Hasan Hilmi Bey al Juwaisar (II), c. 1874, then general governor (*mudir 'umum*) of Kordofan and Darfur, 1875-9.

'Ali Bey Sharif (?).
 Mahmud Tahir Bey, c. 1874-8.
 Ilyas Pasha Umm Birair, 1878.

'Abd al Rahman Bey Naji 1879.
Muhammad Sa'id Pasha Wahbi (II), 1879-83.*

MUSAWWA,

Turkish

(Dependency of Vilayet of Jidda)

Governor (*Qa'immaqam*)

Muhammad Qapudan (*Musawwa 'hakimi*), fl. 1839-40.
Rustum . . . , -1846.
'Arif . . . , 1846-7.

Egyptian

Governor (*Muhafiz*)

Isma'il Haqqi Abu Jabal, 1847-

Turkish

Governor (*Qa'immaqam*)

'Umar . . . , fl. 1849.
Muhammad Pasha Amin, 1851.*
Hafiz Ibrahim Pasha, -1855.
Pertev . . . , fl. 1862-3.

Egyptian

Governor (*Muhafiz*)

Hasan Rif'at Bey, 1866-8.
Muhammad Bey Rasikh, 1868-81 (?).
'Ala' al-Din Bey Siddig (I), 1871.
J. A. W. Munzinger Bey, 1871-3.
Arakil Bey Nubar, 1874-5.*
Ahmad Nashat Bey, 1875-7.
'Uthman Rifgi Pasha (with Sawakin), 1877.
'Ala' al Din Pasha . . . (II) (with Sawakin), 1877-81.
Khurshid Bey Pertev, -1883.
Muhammad Mukhtar Pasha, 1883-4.
A. McC. Mason Bey, 1884-5.

RED SEA LITTORAL, EASTERN SUDAN

General Governor (*Mudir 'umum*)

'Abd al Qadir Pasha . . . , 1867-
Ahmad Mumtaz Pasha, 1870-1.
Sanjar Bey Urfali, 1873.
J. A. W. Munzinger Pasha, 1873-5.*
Rashid Pasha Rajab, c. -1875.
'Ali al Rida Pasha al Tubji, 1880-1.
'Ala' al Din Pasha Siddig 1882-3.
Rashid Kamil Bey, 1883.
Sulaiman Pasha Niyazi, 1883.
Husain Wasif Sirri Pasha, 1883-4.
Sir W. N. W. Hewett, 1884.
Sir C. Ashburnham, 1884.
Sir H. C. Chermiside Pasha, 1884-6.

SAWAKIN

Turkish

(Dependency of Vilayet of Jidda)

Governor (*Qa'immaqam*)

Husain . . . , fl. 1830.

Haidar . . . , fl. 1834.

'Abd Allāh . . . , fl. 1838

Egyptian

Governor (*Muhafiz*)

Muhammad al Amin, 1847-

Turkish

Governor (*Qa'immaqam*)

Nur al Din Pasha . . . , fl. 1854.

Murtad Pasha . . . , fl. 1850-60.

Ahmad Mukhtar (*mu'awin*, acting only ?), 1863-4.

Egyptian

Governor (*Muhafiz*)

Ahmad Mumtaz Bey, 1865-70.

Shakib Bey . . . , 1871.

Mustafa Bey al Tushiyya, 1875-6

'Uthman Rifqi Pasha (with Musawwa'), 1877.

Abu Bakr Pasha . . . , -1879 (?)

Muhammad Bey Rasikh, 1881-2.

Firhad Pasha Muhhib, 1883 (?)

Muhammad Bey Tawfiq al Misri, 1883.*

'Ali Bey Wahbi, 1883-4.

SENNAR

(For period 1820-33, see under

GOVERNORS-GENERAL)

Governor (*Mudir*)

Mustafa Bey . . . (I), 1837-9.

Ibrahim Bey . . . , 1839.

Mustafa Bey . . . (II), 1839-c. 1840.

Amin Bey . . . (?)

Sulaiman Pasha al-Kharbutli, 1843-4.

Muhammad al Amin Pasha, 1844-

Ibrahim Bey . . . , 1851.

Ilyas Bey Kiridli, 1851(?)

Isma'il Bey . . . , 1854.*

Muhammad Bey . . . , 1854.

Mahmud Bey . . . , 1854-5.

Salih Bey Kawalali, 1855-

'Ali . . . , -1862 (discharged, then reinstated Dec. 1862).

Muhammad Hilmi Bey, 1863.

Ahmad Zamil, fl. 1866.

'Abd al Raziq Haqqi Pasha, 1873-6.

Muhammad Bey Rasikh, 1878-9.

Almās Bey (Muhammad ?), 1879.

Busati Bey Madani ('after 1878')

Yusuf Pasha (Hasan al-Shallali ?), 1879-

Hasan Sadiq Bey, c. 1882-1885.*

SUDAN NOTES AND RECORDS

' SOUTH SUDAN '

(Combined Provinces of Sennar, Khartoum and the Muhafizate of the White Nile)

General Governor (*Mudir'umum*)

Period 1 : 1856-63.

Arakil Bey al Armani, 1856-8.*
Hasan Bey Salami al Jarkas, 1859-61.
Muhammad Bey Rasikh, 1861-3.

Period 2 : 1871-3.

Ahmad Mumtaz Pasha, 1871-2.
Adam Pasha al'Arifi, called al Taqalawi (acting), 1872-3.
Isma'il Pasha Ayyub, 1873.

TAKA

Governor (*Mudir*)

Firhad Pasha . . . , fl. 1843.
Yusuf Bey . . . , 1843-6(?)
Khusraw Bey . . . , 1851-4.
Ilyas Bey Kiridli, c. 1854-60 (intermittently).
'Uthman Bey . . . , c. 1854-6.
'Ali Bey . . . , 1858-61.
Hasan Bey Salami al Jarkas (I), 1861.
Mustafa Bey al Muzaffar, 1861-2.
Ibrahim Bey al Mahallawi, 1863.
Hasan Bey Salami al Jarkas (II) (acting), 1865.
'Uthman Bey Najib, 1866.
Ibrahim Bey Lutfi, 1866 *
Hasan Hilmi Bey al Juwaisar, 1866.
Hasan Bey Rif'at, 1866.
'Abd al Raziq Haqqi Pasha (I), 1866-70.
Raghab Bey . . . (?).
Ahmed Bey Rami (?).
'Abd al Wahhab Bey . . . , 1871.
'Ala' al Din Pasha Siddiq 1871-6.
Mustafa Bey al Tushiyya, 1876-7.
'Abd al-Raziq Hqaqi Pasha (II), 1877-9.
Muhammad Sa'id Pasha Wahbi (acting), 1879.
Yusuf Pasha Siddiq, 1879-82.
Ahmed Pasha 'Iffat, 1884-5 *

WHITE NILE

Salim Qapudan (*Bahr-i-a'yada ma'mur*), 1839-42.

Governor (*Muhafiz*)

Salih Hijazi, 1855-62.

Governor (Variously *muhafiz* and *mudir*)

Salih Hijazi, 1863-
'Umar Bey . . . , - 1865.
Muhammad Hilmi Bey, 1865-7.
'Ali al-Rida Bey al Kurdi (I), 1867-71,

Yusuf Bey Hasan al Shallali, *fl.* 1873-75.
'Ali al Rida Bey al Ku'di (II), 1875-8.
al Tayyib Bey . . . , 1878.
Rashid Bey Ayman, - 1881*
Muhammad Bey Shukri, 1881 (?) - 1883.

ZAILA

(Dependency of Harar)

Governor (*Muhafiz*)

Abu Bakr Pasha Ibrahim, 1879.

NOTES ON TSETSE FLIES IN THE ANGLO-EGYPTIAN SUDAN

By D.J. Lewis

Numerous writers have contributed to our knowledge of the tsetse flies of the Sudan over a long period. The information available in the middle of 1949 was assembled by Lewis (1950), and the present paper comprises additional notes and records of flies identified up to March 1950.

For many years work on tsetse flies in this country was directed mainly towards the control of *Glossina palpalis*, the vector of human sleeping sickness. The number of cases has now been reduced to a low figure, mainly by medical surveys and treatment, and the disease is no longer an important problem.

During the work on *G. palpalis*, much information was gained about *G. morsitans* which, as the main vector of animal trypanosomiasis, is the most important tsetse fly in the country. In the future it is likely that work on this species will take the form of systematic surveys and investigations followed by discriminative clearing and other methods of control. This new phase has already begun with the arrival of Mr. E.T.M. Reid, the Veterinary Entomologist, early in 1950.

In November and December 1949 Professor P.A. Buxton made a tour of the main tsetse fly areas, and his comments and recommendations were sent to the Sudan Government and also circulated by the Trypanosomiasis Bureau at Leopoldville (Buxton, 1950). The section dealing with measures against *G. palpalis* is referred to later.

Maps of tsetse fly distribution

At the Brazzaville Conference of 1948 (Conference . . . , 1950, pp 9193) arrangements were made to establish, and keep up to date, maps of the distribution of tsetse flies in Africa on the basis of maps on the 1 : 3,000,000 scale furnished by the delegates from each territory; international symbols were adopted for representing each species.

In this system of maps the Sudan will appear on the 1 : 8,000,000 map of Africa and the 1 : 3,000,000 map of Eastern Africa, which are both being prepared by Mr. W.H. Potts of the Tsetse Research Organization, Shinyanga, Tanganyika.

The existing map of the Sudan itself published by Lewis (1950), approximately 1 : 3,000,000, already requires revision owing to the discovery of tsetse flies in new areas. It is suggested that when another map is

prepared it should be on the 1 : 2,000,000 scale with the omission of the original detailed records of *G. palpalis* and *G. morsitans* and the addition of more place names.

Glossina fuscipleuris Newstead.

This large species is now known from three places in forest country near the southern border, Kendi (Aloma Plateau, J.G. Myers), the Li Yubu area and Yambio.

Glossina fusca Walker

This is also a large forest species found near the southern border, and the total of its known localities are the R. Masumbo (5°3' 27' 34," and its tributary the Nabiri), Li Rangu, Li Yubu and Yambio. It is usually found in small numbers, but a collection from the river Masumbo comprised 65 of this species and no others.

Glossina palpalis ssp. *fuscipes* Newstead.

Distribution.

Two early records of this species were made by Alexander (1907) who reported that it was common at Wandī, on the Yei River, in October 1906 and very troublesome on this river in November of the same year. Some recent records are from Chielkong (R. Jokau), the Getti bridge (7° 57', 27° 50', Khor Leira and near Mabili (the two latter south-east of Wau).

The map published by the Kenya Tsetse Fly and Trypanosomiasis Committee (1949) shows *G. palpalis* on the Sudan frontier north of Lake Rudolf. It is learnt however that the original collection was made in the valley of the River Omo, and there is no record from Sudan territory in this area.

Notes on control measures in the past.

As account of some of the early work against sleeping sickness and *G. palpalis* was given by Maurice (1939), and indicates the difficulties under which it was carried out. Two members of the Sudan Sleeping Sickness Commission toured the south, watching for an invasion of the disease, and found tsetse flies along some 1000 miles of the frontier. The medical officer who reached Tambura in March, 1918, found 60 cases of sleeping sickness in his first week there and 255 in the next six months without leaving the station. Li Yubu was explored in 1920 with a view to establishing a settlement for patients where food would be grown and deserters to the Congo would not infect tsetse flies on their way. In due course Li Yubu was occupied, undergrowth cleared and grass established. In those days the journey to Khartoum seldom took less than six weeks, and Maurice travelled 3,500 miles by bicycle in 13 months,

The position of villages in relation to streams is important from the point of view of attacking *G. palpalis*. Information on re-settlement in the Zande area has recently been published by Ferguson (1949) and Wyld (1949). As a precaution against sleeping sickness people were obliged to live along the roads from about 1918 till 1939 when restrictions were relaxed and the people rapidly began to scatter themselves in the bush. In 1946 a system of dispersed villages was started as part of the Zande Scheme for development. Each comprised 50 families and covered two to three square miles, being laid out with regard to suitable water supplies from streams and wells. Stream fringes and certain forest areas were protected. The population of the district is about 180,000, situated mainly in the wetter and more fertile area near the Nile-Congo divide, and by the end of 1948 about 70 per cent of this number had been re-settled in 540 villages.

Measures against *G. palpalis* in the future.

At present sleeping sickness is controlled chiefly by inspection of the population and treatment of cases. Buxton (1950) supported this policy but did not consider that unrestricted contact between man and *G. palpalis* should be allowed. He commented on the methods now used against this fly and made recommendations for the future. These should be read in the original by those concerned with measures against *G. palpalis*, but his main points may be summarised as follows :—

Hand-catching, which requires more supervisory staff than is available, should be given up, except for a small nucleus of fly boys which could be expanded if an outbreak threatened. Block and rod clearings should be given up. The regulations regarding the maintenance of clearings round watering places cannot be thoroughly carried out in the Zande area, where people are widely dispersed, and it is doubtful if they would be of much value. In so far as the regulations relate to sleeping sickness they should be cancelled.

In places where there is, or is likely to be, an appreciable risk of sleeping sickness people should be encouraged to fell bush, but not trees, on the banks of streams, particularly near villages. Grass cutting is probably not worth the expense and effort it entails unless it is found to encourage a valuable creeping grass which would hold stream banks more effectively than clumps or tussocks of tall grass would do. Clearing bush should drive back *G. palpalis* from the neighbourhood of villages and reduce contact between it and man at no cost to the Government. Inspection of existing clearings suggests that removal of bush will not cause erosion but that grass will actually increase and hold the banks in nearly all types of soil and slope.

Glossina tachinoides Westwood.

This species has a remarkable distribution. It is widespread in West Africa but is unknown for more than 1,000 miles to the east where it has been recorded from the Aden Protectorate and from the Kigille—Gambela area on both sides of the Sudan—Ethiopian frontier. Two additional localities, both on the River Jokau not far from Kigille, have been established by collections sent by Captain G.S. Renny. These comprised 21 males and 26 females (with two males of *G. palpalis*) from Chielkong and ten males and nine females from a forest four miles north-east of Jökau. Twenty more *G. tachinoides* have been collected at Kigille, 11 males and nine females.

Buxton (1950) points out that this species is an important vector of human and animal trypanosomiasis in the dry parts of West Africa, and thinks that other foci may exist in the Sudan, possibly on the Bahr el Arab. I am informed by Dr. F.L. Vanderplank that in Nigeria *G. tachinoides* is most difficult to detect where only small numbers are present. In such places the flies do not come to man but prefer certain animals, and pigs have been found to attract it in places considered to be free of tsetse flies.

Glossina morsitans Westwood**The status and distribution of *G. morsitans* and *submorsitans* in Africa**

G. morsitans was described in 1850. Vanderplank (1949) considers that in former times it consisted of variants linked by a continuous cline across Africa, and he now recognizes a number of named forms, but considers that intermediate forms exist. These named forms include the type form and two subspecies, one of which, ssp. *submorsitans*, has been stated to occur in the Sudan.

G. submorsitans was described in 1910 as a West African species closely allied to *G. morsitans*. Since then it has variously been regarded as a species or as a subspecies, variety, race or form of *G. morsitans*. Vanderplank (1949) described three forms of subspecies *submorsitans*, calling one *ugandensis*, and provisionally regarded them as races.

A map of tsetse fly distribution in Africa published by Newstead and others in 1924 showed *G. morsitans* occurring in East Africa and extending north-westwards across the Sudan into Ubangi Shari with an outlier in the Nuba Hills. *G. submorsitans* was shown as covering a large area in West Africa and also an area in Ubangi Shari with an eastward extension into the Sudan as far as the Tonj district.

Vanderplank's (1949) map showed a different picture, with *G. morsitans* south-west of Lake Victoria, and *G. m. submorsitans* race *ugandensis* ranging from northern Uganda across the south-western Sudan into Ubangi Shari,

The identity and distribution of the forms in the Sudan.

The Sudan forms of *G. morsitans* are of interest for two reasons. The Sudan occupies a central position in the range of *G. morsitans*, so that the nature of its representatives of this species can add information to the two conflicting views mentioned above. At the same time it is desirable to know what forms are present in this country because the behaviour of the various forms may differ and also, therefore, their economic importance and the measures necessary for their control.

The terminalia of 211 males have been examined, together with some Nigerian and Uganda specimens for comparison. All were flattened, and many were mounted in Puri's (chloral gum) medium without caustic postash treatment in order to show clearly the structure of the median lobes of the superior claspers.

The characters which distinguish *G. morsitans* and ssp. *submorsitans* were found to be so indefinite or variable that a single character was adopted as the criterion for identifying an individual fly, the degree of divergence of the inward extensions of the median lobes. If these were in contact for a distance less than the terminal width of one lobe the specimen was classed as *G. morsitans*. Otherwise it was classed as *submorsitans* or an intermediate form. It is often difficult to identify individuals owing to variation and to differences in appearance caused by mounting. It is therefore desirable to examine about ten or more males from each locality.

All the Sudan specimens examined could be assigned two forms, which are provisionally regarded as *G. morsitans* and a form intermediate between it and *submorsitans*. In the intermediate form the length of contact between the median lobes was variable but sometimes equalled or even exceeded that shown in Newstead's figure of *submorsitans*. This form lacked the strip of pale chitin which extends along the whole inner margin of the superior clasper in *submorsitans* and is clearly seen in Nigerian specimens. The terminalia of the intermediate form were unlike those of Vanderplank's description of race *ugandensis* but closely resembled his *G. morsitans* ssp. *orientalis*. In both Sudan forms the superior claspers tend to have the angular outline of West African *submorsitans*.

G. morsitans has been found at a number of places east of the Nile, including the Boma area, Farajok, Kigille, Laposs, Opari, the Roseires area, Sirisiri, Teriteinia and Torit, and at some places west of the river.

The intermediate form occurs at many places west of the Nile, including Amadi, Li Yubu, Raga, the Rumbek area, the Jebel Tinga area (in the extreme west) Wau and the Yirol area, and at some places east of the river.

This view of the identity and distribution of the Sudan forms differs

from both the accounts mentioned above. It amounts to a gradual transition from *G. morsitans* in the east to a form approaching *G. m. submorsitans* in the west. North of Juba this gradual transition is interrupted by the great swamps of the Nile which forms a barrier to east-west movement of tsetse flies. A batch of specimens from the Nuba Hills can easily be differentiated from collections hitherto made on the Ethiopian border.

Specimens examined from Uganda included both the Sudan forms.

Some old records.

Marno (1873) travelled in the region of the upper Blue Nile, which was then known as Sennar, in 1870 and 1871, and penetrated as far as the neighbourhood of the Khor Yabus (Marno, 1874). He reported that specimens of *G. morsitans* had been brought to him, but did not specify the locality.

Wilson and Felkin (1882) travelled from Uganda to Dara via Lado and Raga in 1879 and reported finding "the true tsetse fly," *G. morsitans*, north of Raga at about $9^{\circ} 30'$, $25^{\circ} 30'$ on 13th. December. They considered that the fly accounted for the absence of cattle between that point and the Bahr el Arab, and remarked on the absence of tsetse north of the river.

According to Greig (quoted by Lewis, 1950) and Austen (1905) *G. morsitans* was once reported to exist six miles from Shambe. It has never been definitely recorded within about 40 miles of Shambe, but may have followed game northward from time to time. In 1899 "lions, elephants, ostriches, giraffes, buffaloes and various species of antelopes were met with in large numbers" in the neighbourhood of Shambe (Gage, 1950), and game is still common in the vicinity.

The place where Neave first found *G. morsitans* in his 1905 survey, Gok, has now been located by reference to Felkin and Wilson's (1882) book. It is five miles up the River Gel from Aberial which is $7^{\circ} 2'$ north.

The 1911 handbook of the Bahr el Ghazal Province contains several references to tsetse flies in route reports compiled chiefly in the dry seasons of 1909 and 1910. They are mentioned below because some of the old routes traversed country which is now seldom visited and because old records are sometimes useful for studying changes in distribution. Game animals were reported to be unevenly distributed, occurring principally near streams and rivers. Large areas of forest or nearly waterless country contained no game. Tsetse flies were present in the south and almost everywhere in the west, and tsetse "belts" were common south of a line from Mvolo to Ukanda (Khor Akanda, 32 km. north of Raffile). The flies were held responsible for a heavy mortality of transport animals, of

which Abyssinian mules were said to be the least susceptible. Sheep and goats suffered in the west but the latter could thrive for a time in bad places. Bulls could not be used south of Mvolo. Cattle and even horses appeared to thrive at Yakaluku which is in the Congo about 95 km. south-west of Meridi.

On the northern route from Wau to Raga, via Chak Chak and Gossinga; fly were very much in evidence between Khor Oderi, $8^{\circ}38'$, $26^{\circ}43'$, and Sheikh Morgan, $8^{\circ}37'$ $26^{\circ}06'$, more so than between Deim Zubeir and Raga, but the Wau-Chak Chak area was almost free.

On the Wau-Deim Zubeir-Raga route tsetse were common, and particularly bad for some distance east of Khor Gamus which is at $7^{\circ}42'$, $26^{\circ}26'$. On the whole the northern route was considered to be preferable.

On the Wau-Tonj road tsetse were seen almost the whole way and were particularly bad between Arum and Aidu.

Between Mvolo and Lau Post there were no fly except at Mvolo where they were sometimes bad.

On the Mvolo-Meridi route tsetse varied from year to year.

Between Wau and Tembura game was very plentiful and tsetse were bad most of the way. They were found all the way from Ukanda to Khojali and between Khoali and Tembura, were seen as far south as the Khor Pongo (probably Khor Bangu).

No satisfactory repellent against tsetse flies has been discovered, but Theobald (1904) made an early attempt to find one. Following an unsuccessful effort to repel flies by sponging animals with paraffin, he despatched to the Sudan two beer barrels containing 18 gallons of extract made from three sacks of bruised walnut leaves on the strength of reports of their use against biting flies in the Bernese Oberland. Drew (1911) reported that the Arabs smeared a mixture of tobacco juice and mud on their animals twice a day.

The Daga — Gallabat area.

Along the eastern frontier between Daga Post and Gallabat lies an area about 500 kilometres long in which tsetse flies have been reported but no precise record of *G. morsitans* has ever been made. Marno's indefinite (1873) record of this species has already been mentioned. Subsequent reports, summarized by Lewis (1950), include a report of *G. morsitans* from the Roseires district, a suggestion that it occurs from the Khor Yabus to Gallabat or even further north during the rains, and a report of tsetse flies on the upper River Rahad. *G. palpalis* is known to exist on the Khor Yabus. A preserved specimen of *G. morsitans* is labelled as having come from a point between Roseires and El Garef which is 23 km. north of the town.

It is hoped that as more people visit the area, in connection with the mechanical crop production schemes and the Dinder Game Reserve, specimens will be collected which will confirm the occurrence of *G. morsitans* and help to definite its distribution.

Additional notes on the distribution of *G. morsitans*.

Some recent records within the main tsetse area are from Khor Filette (near Liria), Ibunyak ($4^{\circ} 11'$, $33^{\circ} 4'$), Isoke, the Jur Narrows at $8^{\circ} 54'$, $28^{\circ} 43'$, R. Koss at $4^{\circ} 14'$, Lofi, Khor Ngorosai (6 km. S. of Meridi), south-east of Jebel Tinga (near the source of the Bahr el Arab), and the Wadi Mafi ($4^{\circ} 25'$, $31^{\circ} 10'$).

The main tsetse fly area probably contains fly-free patches. It was recently noticed that *G. morsitans* was common on the R. Kifu and some other streams south of Jambo's but was not seen in the intervening country even in the rains.

A notable feature of the distribution of *G. morsitans* in the Sudan is the existence of "islands" of fly north of the main tsetse area. These are naturally of considerable interest in relation to cattle trypanosomiasis in the large tsetse-free areas of the Upper Nile Province and elsewhere. The vegetation survey of Morrison *et al.* (1948) provides information about patches of bush which might support tsetse flies in the grassy *toich* country. The Teriteinia tsetse area near the Imatong Mountains appears to be an island of *G. morsitans* rather than the northern tip of a large area, to judge from the Uganda (1950) report that fly have moved southward from the Sudan probably carried by game from the Langia hills to other ranges.

The distribution of *G. morsitans* is closely dependent on that of big game. Much information on this subject is contained in the pages of *Sudan Wild Life and Sport* (1949, 1950); and other sources of information are Brocklehurst (1931), East African High Commission (1948) and Nalder's 1936 *Handbook of Equatoria Province*. There are two national parks, the Dinder and Southern Parks of 2,470 and 7,800 square miles respectively, and others are contemplated. There are eleven reserves and three sanctuaries. The vast annual migration in the south-east is a notable feature of the fauna.

Glossina pallidipes Austen,

One specimen was received from the River Tirigol, which runs north from Mount Lotuke and is near the original Sudan locality of this species.

Summary.

This paper comprises notes on tsetse flies additional to those of Lewis (1950) and includes records made between the middle of 1949 and March 1950.

These notes include some old published records, remarks on measures against *G. palpalis*, and conclusions regarding the identity and distribution of the Sudan forms of *G. morsitans*.

Acknowledgements.

I am very much indebted to the following : to Dr. P.H. Abbott, Dr. S. Basyouni, Dr. A. Bukhari, the Secretary of the Kenya Tsetse Fly and Trypanosomiasis Committee, and Dr. I. Suliman for information about tsetse flies ; to those who have sent specimens for identification, namely Dr. K. Abd El Rahman (Li Yubu area), Mr. I. A. Gillespie, M.R.C.V.S. (Jebel Tinga area), Dr. Kirk O.B.E. and Mr. H.B. Luxmoore, M.R.C.V.S. (south-eastern area), Mr. P.Z. Mackenzie, M.B.E., M.R.C.V.S. (Wau area), and Captain G.S. Renny (Kigille area) ; to Dr. T.A.M. Nash, O.B.E., and Mr. T.W. Chorley for sending specimens from Nigeria and Uganda ; and to the Chief of the Research Division of the Ministry of Agriculture for the use of his entomological collections and other facilities.

REFERENCES.

- ALEXANDER, B. (1907). From the Niger to the Nile. Vol. 2. London : Edward Arnold.
- AUSTEN, E. E. (1905). The distribution of the tsetse flies (genus *Glossina*, as at present known) with map. *Rep. Sleeping Sickness Comm. Roy. Soc.* No. VI, pp. 278-282.
- BAHR EL GHAZAL PROVINCE, THE (1911). Anglo-Egyptian Sudan Handbook Series 1. London : H.M. Stat. Office.
- BROCKLEHURST, H. C. (1931). Game animals of the Sudan. London.
- BUXTON, P. A. (1950). Notes on trypanosomiasis and tsetse in the southern parts of the Anglo-Egyptian Sudan. (Multigraph). Bureau Perm. Interafr. Tsetse Tryp. No. 85.
- CONFERENCE AFRICAINE SUR LA TSE-TSE ET LA TRYPANOSOMIASE, BRAZZAVILLE, 2-8 fevrier 1948 (1950). Toulouse : Imprimerie Regionale.
- DREW, C.M. (1911). Final report of the Sudan Sleeping Sickness Commission, 1909-10. M.S. abstracted in *Bull. Sl. Sickness Bureau*, 3, pp. 85-87.
- EAST AFRICAN HIGH COMMISSION (1948). Fauna of British Eastern and Central Africa. Nairobi, 1947. Nairobi : Gov. Printer.
- FERGUSON, H. (1949). The Zande Scheme. *Empire Cotton Growing Review*, 26, pp. 109-121.
- GAGE, M. F. (1950). Sudd cutting experiences of the expedition from Uganda 1899/1900. *Sudan Notes and Records*, 31, pp. 7-20.
- KENYA TSETSE FLY AND TRYPANOSOMIASIS COMMITTEE (1949). Third progress Report. Nairobi : Government Printer.
- LEWIS, D. J. (1950). The tsetse fly problem in the Anglo-Egyptian Sudan. *Sudan Notes and Records*, 30, pp. 179-210.

- MARNO, E. (1873). Über den Einfluss der Fliegen (Tuban) und insbesondere der Surreta auf die Haustiere Sennaar's. *Mittheilungen aus Justus Perthes' Geographisch Anstalt über Wichtige Neue Erforschungen auf dem Gesamtgebiete der Geographie, von Dr. A. Petermann*, 19, pp. 246-249.
- Gebiete des blauen und weissen Nil, im egyptischen Sudan und den angrenzenden (1874). *Reisen im Negerlandern in den Jahren 1869 bis 1873*. Vienna : Carl Gerold's Sohn.
- MAURICE, G. K. (1939). Sleeping sickness. *Blackwood's Magazine*, 246, pp. 567-592.
- MORISON, G.G.T., HOYLE, A.C. and HOPE-SIMPSON, J. F. (1948). Tropical soil-vegetation catenas and mosaics, a study in the south-western part of the Anglo-Egyptian Sudan. *J. Ecol.*, 36, pp. 1-84.
- SUDAN WILD LIFE AND SPORT. Published half yearly by the Game Warden. Sudan Gov. (vol. 1, 1949, 1950).
- THEOBALD, F. V. (1904). Second report on economic zoology. British Museum (Natural History).
- UGANDA PROTECTORATE (1950). Annual Report of the Tsetse Control Department for the year ended 31st December, 1948.
- VANDERPLANK, F. L. (1949). The classification of *Glossina morsitans* Westwood (Diptera, Muscidae), including a description of a new subspecies, varieties and hybrids. *Proc. R. Ent. Soc. Lond., B.*, 18, pp. 56-64.
- WILSON, C. T. and FELKIN, R. W. (1882). Uganda and the Egyptian Sudan, 2. LONDON : SAMPSON LOW, Marston, Searle and Rivington.
- WYLD, J. W. G. (1949). The Zande Scheme. *Sudan Notes and Records*, 30, pp. 47-57.

ملخص

يحتوى هذا المقال على ملحوظات عن ذباب التمس تس زيادة على تلك التي نشرها لويس فى سنة ١٩٥٠ وتحوى ايضا مذكرات عن الموضوع دونت اثناء الفترة بين منتصف ١٩٤٩ ومارس ١٩٥٠ وفيها ايضا معلومات سبق نشرها وملحوظات عن طرق الوقاية من الذباب المسمى *G. Palpalis* واستنتاجات عن بخواص وتوزيع انواع الذباب *G. Morsitans* فى السودان .

KATIRI CULTIVATION IN THE MORU DISTRICT OF EQUATORIA

By J. R. Catford

A brief account is given here of a system of cultivation found in the Moru district of Equatoria, and known in the Moru dialect as *katiri*. The name refers to a central point round which land is divided by segments among a number of families ; the practice is inseparable from the system of cropping which goes with it, and both are described.

ETHNOLOGY & EXTENT

The system appears to originate among the Moru tribes of the Amadi sub-district. These, with estimated populations, are :

Moru Miza	7,000
Moru Kediru	6,000
Moru Endri	3,000
Moru Baliba.. .. .	2,500
Moru Egi	2,500

Of the non-Moru tribes of the sub-district, the Jur, the Nyamusa and the Wira do not practise the system, but a modified form is however, found among the Morokodo (population : 3,400). In the Maridi sub-district (population : 28,000) a modified form, again, is followed by the Avokaya (who are akin to the Moru) as well as by the Baka and Mundu tribes, by whom it is known as *disiyaka* and *gamuta* respectively. In the notes which follow, the practice is described as it is found among the Moru, and using the Moru terms. The only noteworthy difference in the system as practised by the Baka and the Mundu is as a result of their tendency to grow *dura* in pure stands and not mixed with sesame. The significance of this will be seen later.

In all, some 13,000 families practise *katiri* cultivation in the Moru district ; records of its existence elsewhere have not been discovered. The population is scattered, and although villages of any size are rare, clans of a few related families may live close together.

TOPOGRAPHY, CLIMATE & VEGETATION

The area covers some 9,300 square miles, and extends from Maridi (altitude 2,300 feet) in the south west on the fertile ironstone plateau of the Sudan-Belgian Congo frontier (and the Nile-Congo divide), to the shallow, sheet-eroded, ironstone soils of Amadi (altitude 1,700 feet), ninety miles to the north east. The vegetation is transitional between the high-grass

woodland west of Maridi (annual rainfall about 1,400 mms.), with perennial streams, and the light woodland of Amadi (annual rainfall about 1,200 mms.) which is nearly waterless in the dry season.

DESCRIPTION OF THE *KATIRI*

The *katiri* is a roughly circular cultivation, having a radius of from 200 to 400 yards (exceptionally as much as 800 yards), and occupied by six or eight closely related families who form a clan. The name *katiri* also applies to the central point of this cultivation, which is chosen as a termite mound or large tree. The area is first selected in June, on virgin or *lowa* land, and the vegetation fired. The senior member of the clan then mounts the mound or tree, and divides the full circle according to the hoe strength of the clan. This division is dependent upon the total number of adult women (whether wives, widowed sisters or daughters, or even mothers, of the heads of the families). The various duties of cultivation are, by custom, strictly differentiated between the sexes; at the division of the *katiri* each woman is allotted a segment to which she will confine her efforts, and each family head will thus control one or a number of these segments according to the number of women in his household. On all of these portions he will have to perform the duties traditionally his (principally heavy clearing and sowing).

It is normally arranged that the full circle of the *katiri* shall be divided into ten or twelve segments; if there are more adult women than this in the clan a second *katiri* is opened elsewhere, and at the first division the spread of the individual segments (i.e. the angle subtended at the centre of the circle) is chosen with the intention that each shall be carried outwards to the same distance from the centre. This in turn depends on the numbers and ages of the unmarried children who will work on their mothers' plots; inevitably, for a variety of reasons, some of the segments will ultimately be longer than others. There is strict adherence to straight paths¹ between the segments. When clearing and sowing have been completed a hedge of thorn and brushwood is made round the *katiri*, not following the perimeter of the actual area cleared, but as nearly circular as possible at the radius of the longest segment. This means that some uncultivated land may at first be enclosed, but in subsequent seasons those who initially fall short may later extend their plots up to the hedge. Exceptionally, the whole *katiri* may be extended outwards in the second season, and a new hedge made. The *katiri* is cultivated for two or three seasons, and during this

¹ Usually called *kiswe*.—Ed.

period there is no redivision of the land. The land is then abandoned for four or five years, sometimes more, when the same clan will usually return to the site of a former *katiri*; by this time traces of the earlier cultivation will have been obliterated, and the composition of the clan will have changed, so that a new division is made.

SEQUENCE OF CROPPING

Among those tribes who adopt this practice, the principal crops are invariably grown in a *katiri*. These crops, for the Moru, are *dura* (*Sorghum vulgare*, Moru: *enya*), sesame (*Sesamum orientale*, Moru: *konyu*), and, to a limited extent, beans (usually the cowpea *Vigna unguiculata*, Moru: *koso*). Among the Meridi tribes, sesame is less important and more usually it is not grown in the *katiri*, where *dura* may thus be found in pure stands. It is very unusual to find other crops in the *katiri*; these, such as groundnut (*Arachis hypogaea*), cassava (*Manihot utilissima*), maize (*Zea mays*), *bamia* (*Hibiscus esculentus*), sweet potato (*Ipomoea batatas*) and pumpkins (*Cucurbita spp.* and *Lagenaria vulgaris*), are regarded as garden crops and are grown close to the houses. Cotton, too, which is grown as a directed crop in Meridi sub-district, is sown on an individual plot.

As is usual in peasant agriculture at the bare subsistence level, the acreage of each crop grown by a family varies considerably from year to year, depending on the availability of seeds, of suitable soil and, not least, of human strength and time (such popular diversions as dancing, funeral feasts, litigation, honey gathering, hunting, fishing and sick-visiting invariably competing). But whereas among some tribes this leads to a very variable sequence of cropping and to the cultivation of crops in associations of varying composition, in the *katiri* the association of crops and the sequence of cropping is kept surprisingly constant and any extra area of a principal crop which an individual family may have the time or inclination to grow is sown quite separately near to the house.

The *katiri* is first chosen and opened by burning in late June. A mixture of a short-period *dura* and *eleusine* is broadcast in July, and the land immediately hoed. This constitutes the sowing operation and is performed exclusively by the men. The mixture of the two grain crops may be of equal parts, or one may be in excess of the other. Immediately after germination the men begin to fell the trees, a task which may occupy them for two or three weeks, and the women begin hand weeding which they repeat regularly throughout the season. Harvesting takes place in December and January, the two grains being harvested separately, and, like the subsequent threshing, it is performed by the women. Beans are only occasionally included in the

association in the first season, unless they are introduced varieties such as green gram (*Phaseolus vulgaris*), as the Moru have none which can be planted with success as late as July.

In the second year, the land then being called *tirekya*, cultivation begins earlier and a mixture of a long-period dura and sesame (usually in equal parts) is broadcast in May without previous cleaning, and the land at once hoed. This work is again performed by the men ; shortly afterwards the women carry off the rubbish and begin regular weeding by hand. The women harvest the sesame in September, the men assisting only in tying the stalks in bundles ; the dura is harvested by the women in December and January. Beans are quite often included in the association in this the second season, several long-period varieties being available.

When the land is considered suitable, the *katiri* may be kept open for a third year with an exact repetition of the crops grown in the second. Such land is called *moa*. It is almost always abandoned after this, although sometimes there may be a volunteer ratoon crop of dura to be harvested in a subsequent season. Thus the clan will always have two *katiri* cultivations in use, one recently opened on *lowa*, and one in its second year on *tirekya* ; occasionally they may also have a *katiri moa* in its third year. It is on the latter occasions that the regular sequence of *katiri* cultivation is disrupted, for the tendency, when old *katiri* are being kept open for a third year, is to open small new ones on *lowa* land. In subsequent years there thus follows a shortage of cultivated *tirekya*. This shortage will usually be made good by sowing the sesame crop apart from the *katiri* and near to the houses where there is always plenty of *moa*, although much of it in an exhausted condition.

CROP VARIETIES

The main-crop dura of the Moru is a very tall (eight to ten feet), red-seeded, open-headed variety named *Diri*. An excellent dura for cooking (it can even be prepared whole without grinding) and for beer making, its main disadvantages being that it requires from seven to eight months to mature and that its keeping qualities are poor. This precludes its use on *katiri lowa*, as the ground cannot be opened in time, but it is the long-period dura sown with sesame in all subsequent seasons. A ratoon crop sometimes grows to maturity. *Nyarango*, hardly less tall, open-headed and white-seeded, is the principal short-period variety (six to seven months) sown in the first year. It is less desirable in its cooking qualities, and has the disadvantage of being intolerant of heavy rain. Heavy dews in a dry November are ideal for *Nyarango*. Of even shorter maturation period (five to six months), and suited to poorer conditions, is the white-seeded,

semi-compact headed variety known as *Bari*, which can be sown as late as August ; it grows to the height of six or eight feet, the head bending down as it ripens. Its cooking qualities are considered to be indifferent, and the yield is low. The short-period duras do not yield ratoon crops.

The Maridi tribes, the Mundu and the Baka, did not originally possess these Moru varieties. They have an excellent medium-period dura named *Ndalla* (tall, white-seeded and open-headed) maturing in about seven months, and a similar but red-seeded variety named *Mangbagu*. These served for both the first and the subsequent years of the *katiri*, but there is now a tendency to acquire the short-period Moru duras.

The Moru have several varieties of eleusine which differ in appearance and very slightly in maturation period. They differ little in other characteristics, however, and are usually found sown together quite indiscriminately, and are not harvested separately. There are also several varieties of sesame, but these are specific to the different sections of the tribe, and are not found together.

COOPERATION IN THE *KATIRI*

No particular form of cooperation is peculiar to the *katiri* system of cultivation.

As is commonly practised among many other tribes, any reasonably prosperous family will prepare beer and food and call in friends and neighbours to work on its cultivation. This is done for any or all of the different operations of the season, and attendance is not limited to relations or members of the clan. In fact, for the work of clearing or sowing as many as eighty men may be found at work on one plot, their womenfolk accompanying them to partake of the refreshments, but not, of course, to do this work from which they are barred. When, however, as large a number of helpers as this is expected, some or all of the women of the *katiri* may join in preparing the food and drink, and in this case work may be done on a number of plots. Similar, though smaller, parties are arranged for the women's operations of weeding and harvesting. Up to about thirty women will usually attend, and probably only the householder himself will be present besides.

Although not confined to the *katiri* system, the custom by which widows' cultivations are cleared and sown by a near male relative may also be described as cooperation ; and particularly so since the custom applies equally in cases of sickness or where a man leaves his wife for a year or so to seek salaried employment elsewhere. The roaming instinct is strong among the Moru, and seldom are all the male members of a clan present ;

but though one or other is absent in different seasons, the family cultivations will always be sown and reaped.

The existence of the *katiri* system seems not to arise from a desire to cooperate in the actual working of the land. The ownership of each plot is distinct, and when help is needed it is sought equally from outside the *katiri*. Rather does its existence arise from the need to protect the crops from the depredations of animals and birds. With its boundary fenced against animals, and its central vantage point from which the small boys of the clan can scare away birds, the design of the *katiri* provides for this in a most economical manner.

SUITABILITY OR OTHERWISE OF THE SYSTEM

There is a certain appeal in the tidiness and ingenuity of the *katiri* system, but unfortunately it cannot be said, without reservations, to be an ideal method of land usage. The disqualifications arise alike from agricultural and administrative considerations.

Both soil erosion and soil exhaustion are encouraged by this system, the former by reason of the comparatively large clearings which are made, and the latter because of the tendency to return to an earlier *katiri* before a sufficiently long resting period has elapsed. Agricultural teaching under such soil and climatic conditions, and where most land is sloping, has long been directed towards the encouragement of strip-cropping. This implies the cultivation of rectangular plots, of about thirty yards in width, with their long sides parallel to the land contour, and with untouched strips of bush, also following the contour, between adjacent plots. The *katiri* is the antithesis of such a layout.

The maximum frequency of cropping to be recommended has been fixed, somewhat arbitrarily perhaps, at three years out of ten. Undoubtedly this is conservative advice under some conditions, but in the many places where old *katiri* can be found that have been reopened after only four or five years rest, it is usually apparent that regeneration of fertility has not been achieved.

Although often the reason, it is not always because of the temptation to take advantage of the remnants of the old hedge that a former site is reopened too soon. Geometrically, a plane surface cannot be divided economically into circular areas, and when these areas must be half a mile or so in diameter, must not embrace a stream or other unusable place and yet must have a prominent object in the centre, it is obvious that there can only be a limited number of *katiri* sites within a reasonable distance of a group of homesteads.

The very scattered distribution of the population is at present an administrative problem in the Moru district, and one of the reasons for this is undoubtedly the *katiri* system. There is need for resettlement of the population in more accessible places ; the common rectangular method of land division, with individual holdings for each family bordering straight paths cut for the purpose, is certainly a simple one and has been effective elsewhere. But for it to be successful in the Moru district the traditional method of growing the principal food crops would have to be completely abandoned. For all its faults, the *katiri* system has its advantages, and not the least of these is its effect in maintaining clan and family unity where tribal loyalties are not strong. So far, a method of resettlement which would incorporate the better points of the *katiri* system with individual holding of the land has not presented itself.

ملخص

يصف الكاتب الطريقة الزراعية المعروفة باسم «كتيري» التي تستعملها قبيلة المورو في المديرية الاستوائية وهي ان تنظف مساحة كبيرة من الارض في شكل دائرة يكون مركزها شجرة أو تل من تلال النمل ثم تقسم المساحة الى قطع دائرية وتوزع بين ست الى ثمانية عائلات يكونون جميعا احد بطون القبيلة ثم يستطرد الى وصف المحاصيل التي تستنبت وطريقة زراعتها ودورات الزراعة - ومن المعلوم ان لهذه الطريقة الزراعية اثارا سيئة على التربة

THE WHITE NILE AND THE SOBAT

By J. W. Wright.

Presented to the Philosophical Society at its 36th Ordinary Meeting on 24-10-50.

INTRODUCTION

This paper outlines an investigation, carried out as a spare time hobby, which was made into the hydrology of the White Nile and Sobat floods. The work was done without previous experience of hydrology, and therefore from an unconventional point of view. It was initiated by an enquiry put forward by the Jonglei Investigation Team, and some of the results were incorporated in their third interim report.

When this investigation began, three years ago, comparatively little attention had been paid to these parts of the Nile Basin, since the White Nile and Sobat are relatively simple carrying channels compared with the complex system of swamps and channels further south. It is on these that attention had been concentrated because of the much greater quantities of water lost there by evaporation and transpiration. Nevertheless the losses on the White Nile and Sobat are by no means negligible, and the areas inundated by them every summer and dried out in the following spring are considerable. Moreover these areas have a particular importance because they form during the dry season the only available grazing for the tribes who inhabit this part of the Sudan. But in spite of these facts the size of these areas was not known at all accurately, and the mechanism of the flooding was far from being fully understood. There were for example only rough estimates of the relationship between the height of the river and the size of the area inundated at any given moment ; virtually no figures at all were available for the average depth of water absorbed by the newly wetted land ; nor was it known how much water was lost by evaporation and gained by rainfall during each flood cycle.

Moreover on the White Nile, although it was known that in some years tributary khors such as the Adar and Wol brought in considerable quantities of water, there was little idea how much this was ; and on the Sobat there was no information at all about the shape of its trough in the reach above Abwong, which forms about two-thirds of its total length. Since the Egyptian projects are likely to alter the regime of the White Nile considerably it seemed worth while trying to find out the values of all these

items of the flood cycle on it. The resulting analysis indicated how a similar treatment might be applied to the Sobat, which would also give an idea of its average cross section, and therefore be of value should any control schemes on it later be contemplated,

A very brief outline of the investigation has already been published(1) and the first stage has been worked out and described in full.(2) This paper attempts to summarize the ideas behind the investigation rather than to detail its results, and to put these ideas in a form intelligible to the layman. Since some of them appear to be original, and because of limited space, references to previous work — mainly by the engineers of the Egyptian Irrigation Service in the Sudan — have been confined to those points where the writer disagrees with their conclusions ; but this should not be taken as a lack of appreciation of the immense mass of invaluable data which they have accumulated or of the skill with which it has been interpreted on all main questions. In fact the data which have been used here were supplied almost entirely by the Egyptian Irrigation Service in the Sudan, to whom the author's grateful thanks are due.

The paper falls into three parts : an account of the regimes of the two rivers and of the data used in studying them ; a short description of previous work along the same lines ; and finally an outline of the three stages through which investigation has passed, together with a summary of the results which it has produced.

Some of the more mathematical parts of the analysis have been relegated to an appendix where they will not trouble the general reader.

THE REGIMES OF THE WHITE NILE AND SOBAT RIVERS.

(See map at end of paper)

For a detailed account of these rivers reference should be made to the appropriate accounts by Hurst(3) and Butcher(4), though the latter is not easy of access. The White Nile between Lake No and Sobat Mouth has a very constant flow because the annual fluctuations in the discharge from Lake Albert and of the torrents north of it are almost completely damped out by the swamps through which the river then passes. The Sobat, on the other hand, has a very large annual variation in flow. At Sobat Head it divides into two very nearly equal tributaries, the Baro and the Pibor. The former rises in Ethiopia and is at its height in August and September, while the latter derives its water mainly from the south-eastern Sudan and reaches its peak about a month later ; the contribution of its main tributary, the Gila, is not large. The flood discharge of the Baro is much the same from one year to another because any excess above a

certain amount is spilt before it reaches the Sobat, most of the spill going into the Machar Marshes and being lost to the river. The Pibor discharge, on the other hand, varies considerably from one year to another, and most of its water reaches the Sobat either directly or through the spill channel known as the Khor Torluar (or Twalor). The White Nile flood north of Sobat Mouth is due almost entirely therefore to the flood discharges of the Baro and Pibor combined as the Sobat flood, and below Malakal this may be thought of as superimposed on a steady flow from the Sudd which scarcely varies throughout the year. From this it will be clear that the flood mechanisms of the Sobat and White Nile are intimately connected and may be expected to be very similar. Detailed investigation shows that this is indeed true.

When the flow in a river increases the level must rise, and unless the water is carried in a channel with high vertical banks this rise will be accompanied by an increase in the width of its water surface. On the White Nile and Sobat this increase in width is very marked and a considerable area of land is inundated every year. This area is known as the flood plain and it has long been realised that on both rivers it probably has much the same form, being a series of long narrow channels or basins running parallel to the main river and connected to it by cross channels at infrequent intervals. (Fig. 1.) The rise and fall of each river is therefore accompanied by a complicated system of flow into and out of these basins. This has hitherto been thought of as a form of 'spill' from the main channels which is returned when the rivers fall. Its obvious complexity has made apparently impossible any detailed treatment of the flood cycle without far more data than are available at present. The fundamental idea behind my analysis has been to abandon this concept of spill altogether and to regard the flood plain, not as a separate feature inundated by overflows from the main river, but as the upper part of the river trough which is used only during the flood. As will appear below, this leads to a very great simplification in the analysis of the flood. It is true that this simplification is achieved by assuming that the levels in the side-basins are always the same as those in the corresponding part of the main channel opposite to them. Clearly this will only be true when the river has been steady at high or low level for some time, but it appears that the differences between the main and subsidiary levels in the rising and falling stages are less than was previously supposed. At any rate the discrepancies which these differences cause between the theoretical and observed discharges of the river at any given level are small enough to be included entirely in only one of the items of the flood, so that the effects of all the others may be calculated directly from the available data and apparently with a fair degree of accuracy.

The items which go to make up the whole flood in a river of this type may best be described by considering a certain length of river between two points at which the flow or discharge of the river is measured regularly. At the river rises there will be a difference between the discharges at the two ends due to four main causes, assuming that there is no inflow through tributaries. In the first place the rising river will occupy a greater volume in a given length of valley or trough ; secondly it will at the same time inundate ground which has previously been dry, and this will absorb water until it is saturated ; thirdly there will be rain falling on the upper surface ; and finally water will be lost from this by evaporation at all times when the air above it is not saturated. On the White Nile the combined effect of all these factors may amount to as much as 10 per cent. of the discharge at any one time ; but the total effect during a complete flood cycle will be much less than this since the trough volume returns at the end of the cycle to its initial value and so its effect cancels out.

It will be convenient at this point to consider briefly the data which are available for estimating the values of these items of loss or gain on both rivers. They fall under three main heads : the behaviour of the water, the shape of the trough, and the losses or gains at the two surfaces of the water, where it meets the air and the ground.

The Behaviour of the Water.

The data for studying this are of two kinds : measured discharges and gauge readings. The discharges have been measured regularly on the White Nile at Malakal and Renk ; and on the Sobat at the junction of the Baro and Sobat (Sobat Head) and at Hillet Doleib 8 km. from its mouth. The average error of a single discharge measurement is stated to be 5 per cent and they are taken roughly once every five days. Every care is taken to avoid systematic error but nevertheless this almost certainly occurs due chiefly to changes in the form of the channel causing variations from the assumed value of the relationship between the measured and mean velocities. Discharges are measured by observing the velocity of the water at various points in a cross section whose width and varying depth are also measured at the same time.

Gauge measurements are very much simpler and more accurate since they consist only of reading the water level against a vertical scale. Subsidence of the gauge and tilting of the water surface by wind seem the only possible sources of error apart from occasional mistakes in observation. Gauges are located at intervals of about 100 km. along the stretches of river being considered here. They are read daily and the means for each ten days are published both for them and for discharge measurements, in Volumes III and IV respectively of *The Nile Basin* and their supplements.

At important stations such as Malakal observations began nearly at the beginning of the century ; most of the other data used here go back to about 1930. At present these published volumes take the records only to 1942 but the Egyptian Irrigation Service in Khartoum have kindly supplied the figures for the years up to 1947. Thus the flow of these rivers and the heights of their surfaces are probably the most continuously and accurately recorded of all the data I have used.

The Shape of the Trough.

There are three sets of data for estimating the shapes and sizes of the troughs on these rivers : lines of precise levelling which give their longitudinal slopes, surveyed cross-sections, and uncounted maps. Clearly if any comparison is to be made between theoretical analyses of their floods and the observed differences between discharges, only those parts of the river which are bounded by discharge sites can be considered ; and my investigation has therefore been confined to the White Nile between Malakal and Renk and the Sobat between its head and Hillet Doleib. Over these stretches there are no contoured maps ; but the White Nile north of Renk (north of lat^o 12^o 52') is covered by a series of 1/50,000 maps with half metre contours, and these have been used for checking my methods of working from the cross sections south of them.

Of the lines of precise levelling no more need be said. The cross sections are roughly at 20 km. intervals both on the White Nile and on the lower third of the Sobat ; on the upper Sobat no complete cross sections have apparently ever been surveyed. The characteristic formation of the flood plain already described is shown clearly in these cross sections (see Fig. 1 below), and it is clear from a study of the originals that different cross sections, even when adjacent, have no obvious resemblance to each other since the number and spacing of the side khors and basins vary from place to place along the river and do not appear to follow any systematic or predictable pattern. Thus straightforward interpolation of contours between cross sections so widely spaced is obviously impossible and there seems at first sight to be little chance of obtaining from them either an accurate estimate of the average width of the trough at any height of the river or any idea of the accuracy of such estimates as may be attempted.

Two series of uncounted maps have been made, both from air photographs. The first, on 1/50,000 scale, was made on behalf of the Egyptian Government by a British air survey firm, from vertical photographs taken in 1929-30 from about 13,000 feet.(6) It covers the whole length of the Sobat, and the White Nile as far down as Malakal only. The second, on 1/100,000 scale, was made by the Sudan Survey Department

from American trimetrogon photographs in 1944-45 from 23,000 feet.(7) It covers the whole length of the Sobat and the White Nile as far as Melut. A short stretch of river just south of Renk had also been mapped from the same photographs. For this investigation the chief value of these maps lay in providing independent checks of the areas inundated by these rivers at the height of a normal flood and so in confirming estimates made from cross sections or by other means.

Losses and Gains at the Water Surfaces.

There is one source of gain — rainfall — and two of loss — evaporation and absorption—at the water surfaces. Of these the first has probably the most reliable data, though even in this case the scarcity of the rainfall stations, as may be seen from the map, makes it certain that the averages of values obtained at them may differ considerably from the true averages over the lengths of river considered. Evaporation is presumably more constant over a wide area but the difficulty here lies in establishing a true relationship between its value over large bodies of open or grass grown water and the instrumental value obtained over an area of about one square inch. The Egyptian practice was followed of assuming that the true values are half those recorded instrumentally (by Piche tube) at Malakal and Renk, using a mean for the White Nile and the Malakal values only for the Sobat. In both cases observational errors are known to be large and variable, so for each month the mean of several years' readings was used and this mean value was adopted for each year.

For the absorption of water by the freshly inundated flood plain there seem to be virtually no data, and the average depth assumed was obtained indirectly, as will be explained below. Because this item of the flood was not based on any direct measurements and because it was probably the least accurate, it seemed logical in the detailed analyses of individual floods to include in it the unknown delays of filling the side basins during the rising stage ; and the rate at which absorption was presumed to occur has been derived from comparison of all the other quantities with the differences between the observed discharges at the two ends of the White Nile reach. The average rate of absorption and its relationship to the inundated area which were found on the White Nile were then used in the analyses of the Sobat. For all other items of both floods it was assumed that the transverse water surface was always horizontal, or in other words that the levels in the side basins were always the same as in the main channel opposite them. The water levels in the main channel were of course those which were obtained by direct interpolation between the gauges.

PREVIOUS USES OF THE DATA.

By the Egyptian Irrigation Service.

We may now look briefly at the use made of this mass of data by previous workers, firstly the engineers of the Egyptian Irrigation Service, and secondly the Jonglei Investigation Team which was appointed by the Sudan Government in 1945 to study some of their proposals. The Egyptians have had two main projects on the White Nile. The first, which is complete, is the dam at Jebel Aulia just south of Khartoum which holds back the White Nile during the Blue Nile flood and whose effects are felt as far upstream as Melut. The second project has been concerned with the upper reaches of the White Nile (the Bahr el Jebel and Bahr ez Zeraf). From these a huge quantity of water is spilt every year into the swamps flanking them, because their channels are inadequate to carry the flood water coming from the central African lakes. Various schemes were put forward for eliminating these losses, culminating in that of a canal to run from the Bahr el Jebel at Jonglei nearly to Sobat mouth and so to increase the carrying capacity of the channels in the area of Sudd where the majority of the water is lost. (8) This canal was to be combined with dams at Lakes Victoria and Albert by means of which water would be saved from years of high flood and made available to those when it was low. The main function of the Jonglei Team was to study these proposals.

Little has been published about the working of the Jebel Aulia Reservoir, which was first filled to capacity in 1944 ; but I have had the privilege of seeing the tables of areas and volumes which were calculated by Dr. Amin Bey and are used for it. These tables are based on the cross-sections already mentioned, the river being divided into a number of short reaches each of which straddles a cross section. Longitudinal profiles of the river surface under different conditions are predicted from previous experience and are expressed in terms of reduced levels at each of the cross sections. The surface widths and cross sectional areas at these are then tabulated against reduced levels (i.e. heights above Mean Sea Level) at each of the cross sections. The surface widths thus obtained are assumed to hold good for the whole length of the reach in which each cross section lies. Thus under any given conditions the total surface area or volume of the reservoir is obtained by entering these tables with the corresponding reduced level at each cross section, multiplying the resulting width or cross section area by the length of the reach containing it, and then summing the results. There seem to be to be three disadvantages of this method of working ; the tables have to be fairly extensive, the probable accuracy

of the results cannot be estimated, and when applied to comparatively short stretches of river they do not yield the most accurate results which can be obtained by a different use of the data. The two methods of using the data are illustrated diagrammatically in fig. 2.

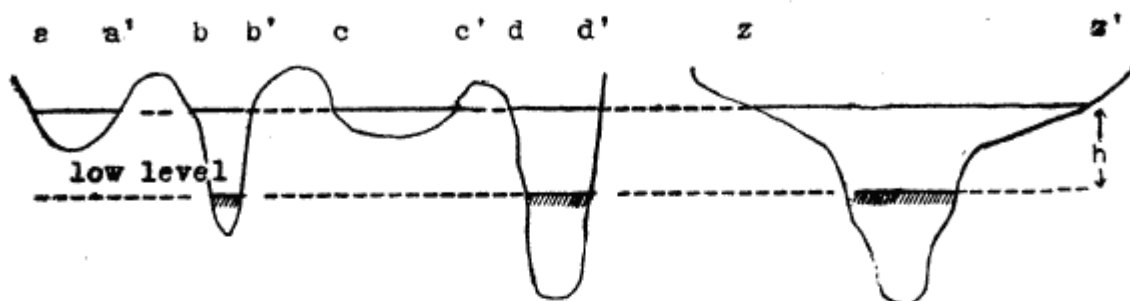
The main characteristics of Sobat hydrology were noted by A.D. Butcher in the memoir already cited. He made use of the concept of spill, as I think wrongly, and regarded the main channel and the flood plain as separate entities, with the result that his estimate of the average area inundated each year was almost certainly about half the true value.

The Jonglei Investigation Team.

One of the main problems of this team was to determine the area of land inundated annually by the White Nile north of Malakal and to estimate the proportion of this which would be permanently covered by water if the Egyptian proposals were carried out and the White Nile was made to carry all the year round a quantity of water comparable to that which at present it carries only in the flood season. This land forms in the dry season the only available grazing for the tribes in the hinterland of this part of the Nile, and so its permanent loss would give rise to serious administrative problems which the Sudan Government could not ignore. It was therefore essential to have some idea of its area and of the proportion which would be lost under different conditions of flow in the White Nile; and the Team proposed in their first interim report that a series of air photographs be taken along the river at different levels, since this seemed to be the only practicable solution.

Meanwhile, however, an ingenious attempt was made by H. A. Morrice, then chairman of the Team, to estimate the area approximately from a consideration of the discharges at Malakal and Renk. Since his method of analysis first gave me the idea of a more detailed investigation of the flood cycle I will outline it here. I have already described how the discharges at two points on the river are caused to differ by its rise and fall, and it is clear that at the end of a flood cycle the 'loss' by increased volume during the rise will have been cancelled out by an equal 'gain' during the fall. Thus the net difference between the total discharges at Malakal and Renk at the end of the flood cycle should be equal to the sum of the losses by evaporation and absorption less the gain by rainfall, so long as the contribution of the tributaries is negligible. By assuming depths for evaporation and absorption based on experience elsewhere and by allowing for the average depth of rainfall over the area obtained from the available records, the theoretical net loss could be expressed as a depth. If the volume of the total observed loss is divided by this the result is clearly the average surface area of the flood, and from this the maximum

Fig. 1. Diagrammatic Cross section of the White Nile Flood Plain, showing Idealization.



Actual Cross section (vertical scale exaggerated 200 times) Idealized Cross Section

$$(zz' = aa' + bb' + cc' + dd' \text{ for all values of } h)$$

Fig. 3. The Items of Cumulative Loss on the White Nile, 1945-46.

APR. MAY. JUN. JUL. AUG. SEP. OCT. NOV. DEC. JAN. FEB. MAR.

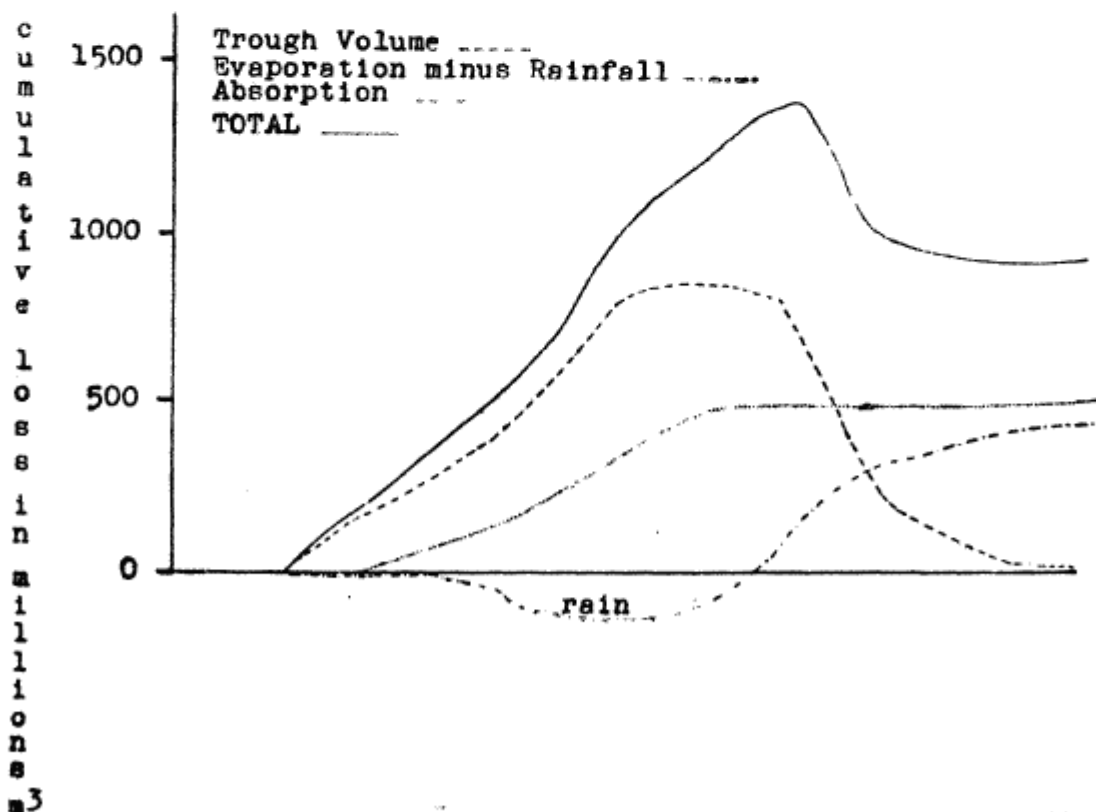
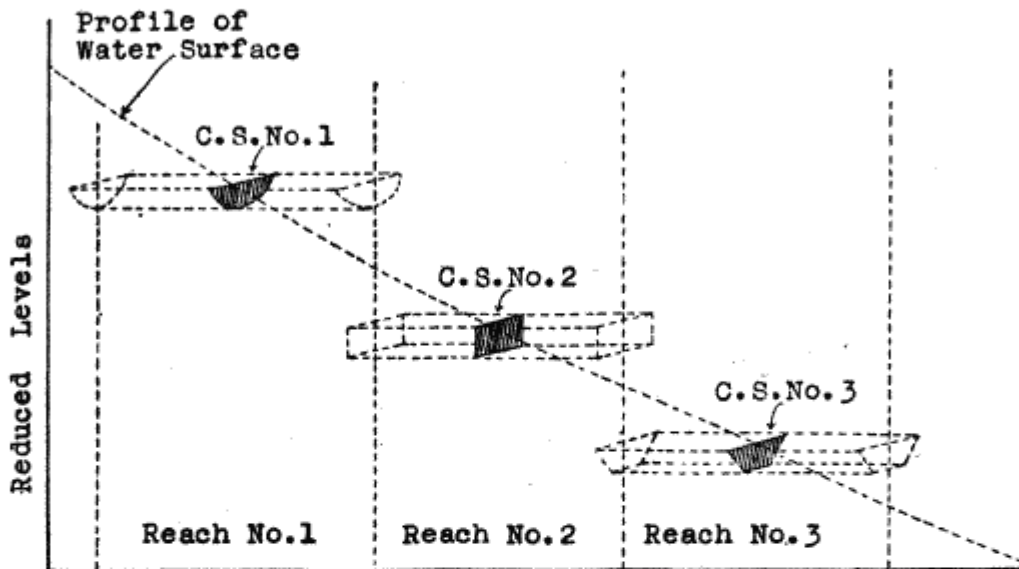


Fig. 2 Methods of Computing Trough Volumes.

(a) Traditional Method, by using reduced levels and individual cross sections.



(b) The Author's Method, by using the mean idealized cross section and an average rise all the way along the reach.

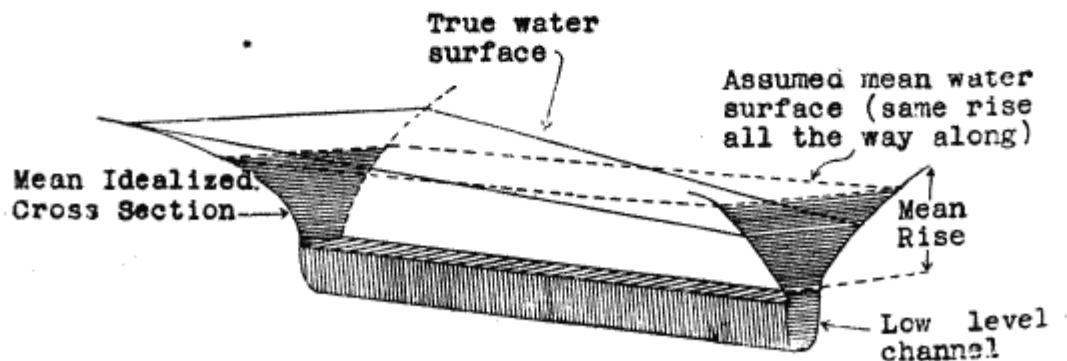
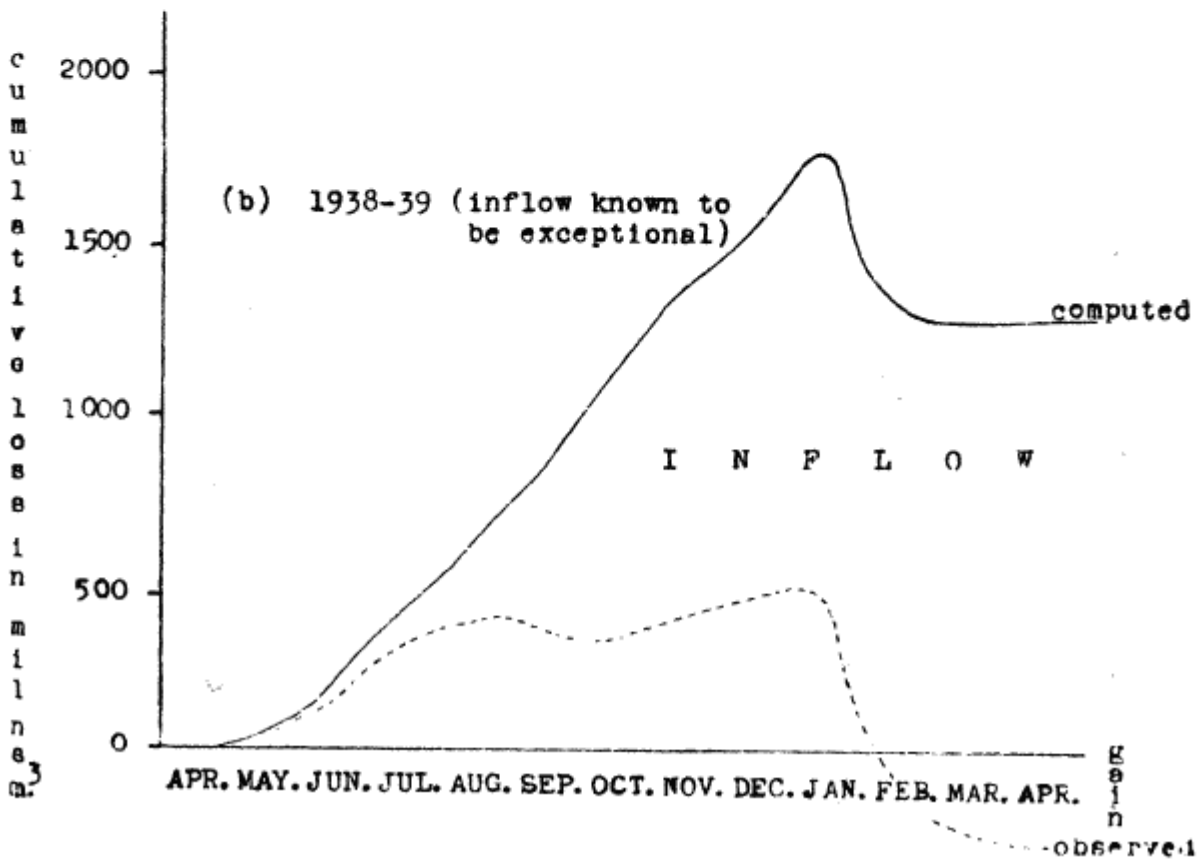
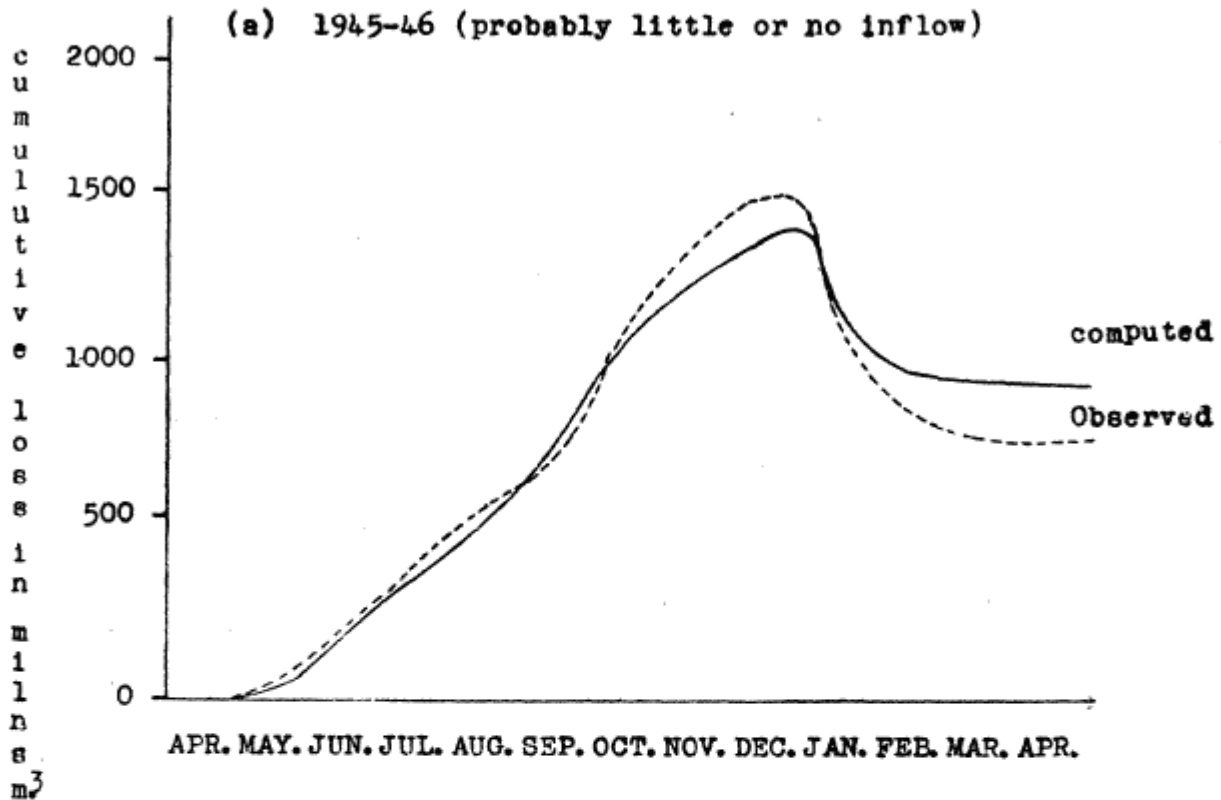


Fig. 4. Comparison of Computed and Observed Cumulative Totals of Loss on the White Nile between Malakal and Renk in two different Flood Cycles.

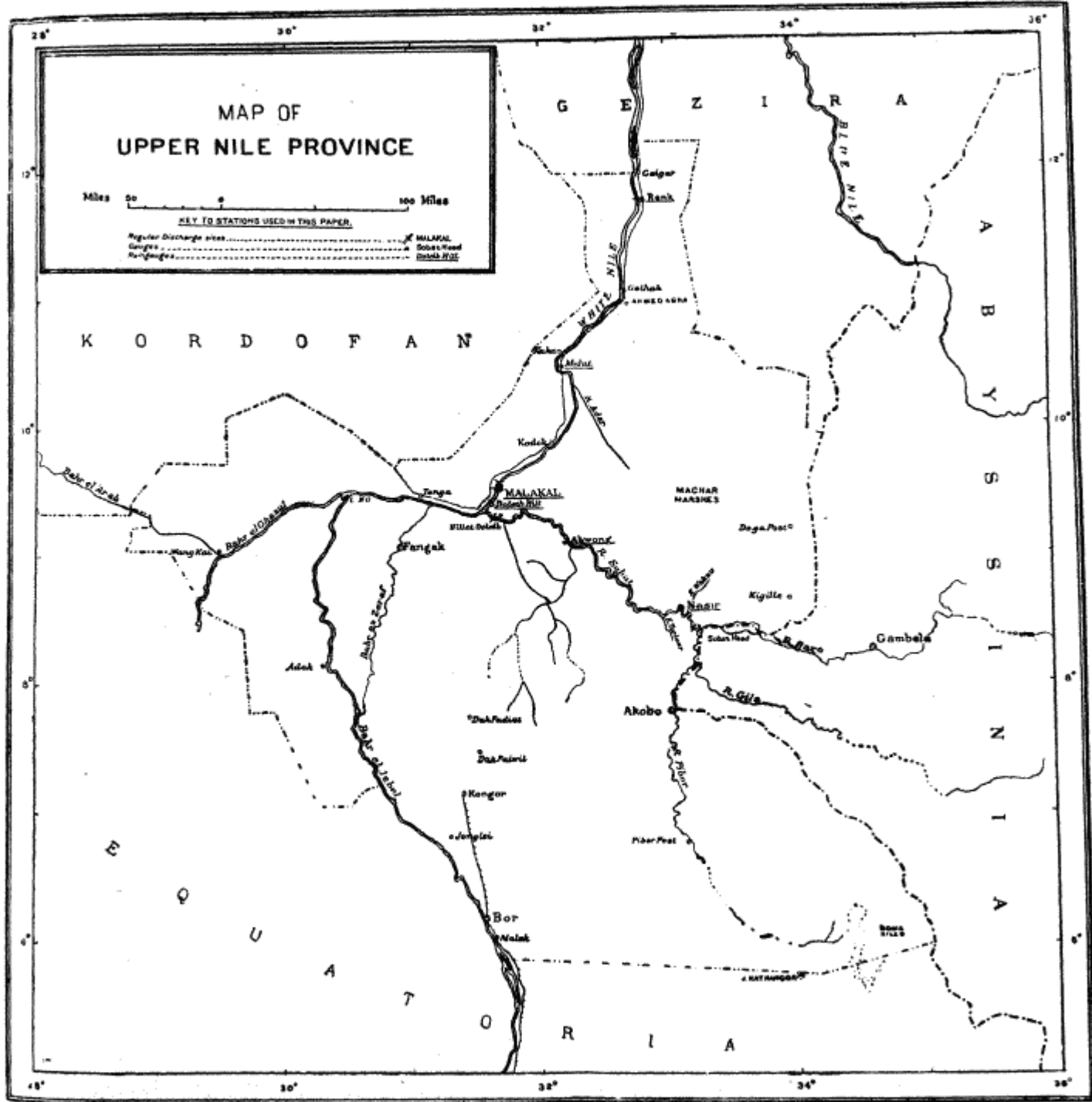


MAP OF UPPER NILE PROVINCE

Miles 50 100 Miles

KEY TO STATIONS USED IN THIS PAPER

Regular Discharge sites MALAKAL
 Gauges Sobat Ford
 Run-gauges Sobat Ford



area inundated can also be deduced. Unfortunately the means at Malakal and Renk used for this analysis were not strictly comparable, but by a curious coincidence the error caused by this was almost exactly cancelled out by the average amount of inflow from tributaries, which Morrice had assumed to be negligible but was actually far from being so. Thus although the flood plain area which he obtained was very close to that obtained later by more direct means and confirmed both by internal evidence and by checks from the new air survey maps, the picture which he presented of the flood mechanism was not correct.

AN OUTLINE OF THE PRESENT INVESTIGATION

Estimate of Areas inundated on the White Nile

Study of the available air photographs indicated that although the highest and the lowest levels of the water could probably be plotted from these with some accuracy it seemed unlikely that the intermediate levels could be determined in the southern part of the river, because long grass effectively screened the water's edge from sight. Thus I was led to consider the cross sections in more detail to see if anything could be gained from them.

Now the difficulty with these cross sections is that there is no uniformity about them. Moreover, if they are looked at in the conventional way there is no chance of any uniformity being observed. This is because the traditional way of drawing a cross section is by reduced levels, or heights above sea level; and it will be clear that even in a river of uniform cross section the shapes of successive individual cross sections drawn up to a certain level will not be the same. They will get smaller and smaller the higher up the river they are. But if one thinks in terms of rises above mean low level of the river, then the successive cross sections will all be the same, if the river trough is of uniform shape. One is then in effect putting an eye to one end of the trough and looking down it, instead of looking at it horizontally.

Even this, however, does not solve the problem on the White Nile and the next step was to simplify each cross section, or what has been called *idealize* it. The idealized version of a cross section is defined by three properties: it has only one channel; this is symmetrical; and its width at any height above mean low level of the river is equal to the sum of the widths of all the channels of the original cross section, (Fig. 1.) When all the White Nile cross sections are idealized in this fashion it is immediately apparent that they have in common the one property for which we have been looking. The increase in the width of the river for any given rise of its water level is very much the same at all of them. Although the number and widths and distance apart of the various channels vary in an

arbitrary fashion from point to point along the river the width of their total water surface at any stage of the river is almost always the same.

The discovery of this property made it possible not only to calculate from the cross sections what area would be flooded by any stretch of the river at any given stage, but it made it possible to show that the results were much more accurate than had been thought likely hitherto. By following simple mathematical rules the probable error of a mean or average of several observations of the same quantity can be calculated ; and so it was possible to calculate the probable error of the average width of the river at any given rise above low level. The averages obtained in two reaches from eight and fourteen cross sections respectively were found to have probable errors of the order of less than ten per cent, and so it could be confidently stated that the calculated values of the corresponding flooded areas had the same proportional errors. These were well within the accuracy required by the Jonglei Team, and so it appeared that the results they wanted could be obtained from data already available, and that the proposed air surveys were not required.

Checks were made by measuring from existing American air photographs the areas flooded at the height of a known flood and comparing them with the results obtained by calculation from the cross sections using the idealized mean and the known height of the flood. In practically all cases when the length of river considered was over ten kilometres the agreement was within ten per cent. An unexpected result was that it was proved over and over again that the conventional treatment of river cross sections did not give the most accurate results over short stretches. Normally engineers assume that the average cross section of a stretch bounded by two measured cross sections is the mean of these two. But these checks showed that it was about twice as accurate to take the mean of *all* the cross sections in the reach in which a short stretch lay, rather than to use only one or two cross sections actually in the short stretch. There is in fact a considerable local variation in idealized cross section but very little long term variation of the average, even over a reach stretching from Malakal to Jebelein. In other words the best way to estimate the surface area or contained volume of a short stretch of river was to think of it as a length cut off like a sausage from a very much longer piece whose cross section was uniform. (Fig. 2.)

There was one more important property of the flood plain of the White Nile which was used when the Sobat was studied. This was that the average increase in width varied approximately as the square of the rise above low level. In other words the profiles of the banks of the

idealized trough were roughly parabolic. This meant that the width of the water surface outside the main channel at any stage of the flood could be expressed approximately as a constant multiplied by the square of the rise above low level. Thus the mean idealized cross section of a river of this type could be expressed approximately in terms of only two quantities—the average width of the low level channel and the constant of its bank profile. This constant had different values in the three sections of the White Nile distinguished above, but the same form of mean idealized cross-section was found on a part of the Pibor where some cross-sections had been measured (9), so there seemed to be some chance of a similar formation being found on the Sobat in between.

It must be realized that although the idealized trough is of value in making estimates of surface area and volume, and assessing their accuracy, it cannot be used for calculations of the flow characteristics of the river. Owing to the complex nature of the actual flood plain and the grass which covers it the main flow of the river is virtually confined to the permanent channels which are too deep to have grass growing in them. The idealized trough appears to represent quite accurately the actual conditions of surface area and storage in the complicated and varying channels of the river, but it does not represent actual conditions of flow, and at the moment no reason can be seen to connect this parabolic shape of its banks with the flow conditions in these rivers.

Analysis of the White Nile Flood.

The main result of this first stage in this investigation had been to show that there was a definite relationship between the rise above low level and the average width of the river, from which the surface area of any desired reach could be obtained. It followed from this that the values of the four items detailed above (trough volume, rainfall, evaporation, and absorption) could be calculated more accurately than had hitherto been thought possible; and so a detailed analysis of the White Nile flood cycle could be made. Moreover, by comparing the theoretical differences between the discharges at Malakal and Renk obtained from this analysis with those actually observed, it might be possible to deduce the amount and nature of the inflow by the tributary khors. Since some of these, such as the Adar, drain the Machar Marsh area into which vast quantities of water are split annually by the Baro, the results would be of value if any attempt to develop this area were contemplated.

The data available have already been described; the general form of analysis used by Morrice was followed except that whereas he had used the observed discharges to estimate the areas flooded I used the known areas

to compute the theoretical discharge differences and then compared these with those actually observed. The stretch between Malakal and Renk was divided into two parts at Melut. The idealized troughs of the river above and below this point were significantly different and moreover the average rises along them were also often different, particularly in recent years when the lower end was held up artificially during the falling stage by the backwater effect of the Jebel Aulia dam. The ten day mean gauge readings at Malakal, Melut, and Renk were converted into rises and so into average widths and surface areas or volumes, and so for each flood the gains and losses by trough volume, evaporation, rainfall, and absorption for each ten day period of the flood could be calculated.

Since the total loss or gain in any individual ten day period is often small enough to be masked by accidental errors in the observed discharges, a significant comparison with these could only be obtained by comparing cumulative sums as had been done by Morrice. It will be clear that the curve of cumulative total loss plotted against time will rise steadily as the river rises, and reach its peak at about the same time. It will fall sharply as the river drops and as the water stored temporarily in the side basins is returned to the main channel ; for as this water passes through the lower discharge site it makes the discharges there temporarily greater than they are at the head of the reach. Change of trough volume is by far the largest cause of the discharge differences and if it were the only one the curve would return to zero at the end of the cycle. But by then on the White Nile the losses by evaporation and absorption have far outweighed the gain by rainfall, and so the curve ends at a distance above the time axis equal to the total net loss throughout the cycle. These points are illustrated by Fig. 3.

This is the form of the *theoretical* curve of cumulative total loss, and its shape varies only in detail from one flood to another, depending on the height and duration of the flood, and to a smaller extent on the amount and distribution of the rainfall. But the actual curve of *observed* loss, obtained by summing cumulatively the differences between the ten day totals of observed discharges at Malakal and Renk, varies a great deal from one year to another. In some years it follows the theoretical curve very closely but in others it never achieves any sort of peak and finally drops right away to finish at a considerable distance below the time axis. These two forms of the curve are shown in Fig. 4. The second form means that at the end of the cycle there has been a net gain between Malakal and Renk ; and this can only be accounted for either by large systematic error in the observed discharges or by heavy inflow in the tributaries entering between the two discharge sites.

It is impossible to say exactly how much of the differences between the observed and computed losses should be ascribed to errors (mainly in the observed discharges) and how much to inflow, since on the White Nile the latter has never been comprehensively measured. There is, however, no doubt that inflow occurs, both because it has been seen and even measured in certain individual tributaries in various years, and also because the average observed loss between Malakal and Renk over a number of years is far too small to give reasonable values for evaporation and absorption. Out of sixteen floods which I have analysed in detail between 1929 and 1947 four appeared to be accompanied by inflow totalling well over a milliard (a thousand million cubic metres), and for three of these four floods there is unequivocal evidence in the Province and District records of unusually heavy flow in some of the tributary khors on both sides of the river. In some cases the discharges of the khors were measured and it is clear from the results that the totals of inflow which I have deduced are by no means too large to be possible. Moreover in the exceptional flood of 1946/47 I deduced very large values indeed for the inflow in February and March 1947, and there is evidence that an almost unprecedented amount of water was entering the river opposite Melut at this time. Thus one of the main results of this analysis has been an estimate of the amount and distribution of the inflow during these floods, and in exceptional cases my results are confirmed qualitatively by independent evidence.

A distinct pattern of inflow has emerged showing two peaks, one when it would be expected following the height of the rains in July and August, and the other somewhat unexpectedly in January and February when the dry season is apparently at its height. This second peak, if it is correct, is nevertheless of more interest than the other since it is probably due either to temporary storage in a depression west of the White Nile or else to overflow from the Machar Marshes caused by heavy spill from the Baro and from the Ethiopian highlands during the previous autumn. It will be clear that both these sources of water which arrives during the dry season are of more interest than water which is available at the height of the rains.

Two other results of this analysis were made possible by the fortunate coincidence of the rainy season with the rising stage of the river and of the dry season with its fall. During the first period evaporation is small and so errors in estimating its value (expressed as a depth) have little effect on the total of computed loss. On the other hand the whole of the loss by absorption may be assumed to occur during this stage, and so this may be deduced by comparison of the observed losses with those caused by the

increase in trough volume and by evaporation less rainfall. The maximum area inundated in each year can also be calculated as already described, and so for each year an estimate may be made of the average depth of water absorbed by the flood plain. Were it not for inflow and discharge errors these depths should agree fairly well in different years, but in fact they do not and some are actually negative. By using only the largest values and assuming a certain range to cover the effect of discharge errors, an attempt was made to obtain a satisfactory mean value, but it must be admitted that this is only approximate. In computing the analyses a value of 80 cms. was used ; according to certain geological evidence this appears to be too large, but the same value assumed for the Sobat seems likely to give consistent results, so I have not altered it.

The other result obtained in a similar way was a check on the assumed value of evaporation at a time when this is large. In the falling stage there is no rainfall and absorption may be assumed to have ceased, so the total gain observed during this stage may be taken as equal to the volume of water released by the emptying of the trough, less the amount lost by evaporation. This last can therefore be derived, and when divided both by the number of days in the falling stage and also by the average surface area during this it may be expressed as an average depth of evaporation per day. The mean of the three largest values (others being excluded by inflow) was very close to the mean obtained by halving instrumental values recorded during the same period ; and this agreement with the values previously assumed gives support to the value of absorption depth derived in the same way. The results of this analysis have been submitted for publication ; they may be worth brief recapitulation. Values have been obtained throughout sixteen flood cycles for the five items of the flood — trough volume, rainfall gain, evaporation loss, absorption, and gain by inflow from the tributaries. Average depths for absorption and evaporation have been derived or confirmed, and inflow was shown to vary considerably from year to year and not to be directly connected with the height of the flood. Some confirmation of the maximum values obtained was found in the administrative records of the area.

Analysis of the Sobat Flood

The methods and results of the White Nile analysis are being used to make a similar analysis (which is not yet complete) of the Sobat flood. Enough has been done to make clear its main outlines, and to show that there are two important differences between the two analyses. The first is that in nearly all years there is little inflow on the Sobat except by two khors near its head whose discharges are measured regularly during the flood

season, their combined flow amounting on the average to about three quarters of a milliard. On the other hand the shape of the Sobat trough for the upper two thirds of its length is completely unknown since there are no measured cross sections of it. At first sight this appeared to be an insuperable obstacle to any attempt at a detailed analysis of its flood because most of the losses occur in this upper reach owing to the greater rise and fall there. It will be recalled, however, that the idealized troughs of the White Nile and also of the Pibor were found to have bank profiles which were approximately parabolic (page 123), and the available sections on the lower Sobat (9) indicated a somewhat similar form there. It seemed therefore worth while to assume tentatively a similar shape for the idealized trough of the upper Sobat. For this only one constant would then have to be determined since the average width of the low level channel was known.

Both absorption and trough volume can be expressed in terms of the rise above low level and this constant, and the formulae used for these are given in the second part of the appendix. All that need be said here is that when this has been done the constant can be calculated in any given year by using the recorded values of the rise obtained from gauge readings to calculate the losses by trough volume and absorption, and equating the results to the losses actually observed during the rising stage of the flood. Allowance has to be made for losses on the lower Sobat, whose cross-section is known, for recorded discharges into or out of the tributary khors, for the estimated loss by evaporation and the gain by rainfall. When this has been done each year's flood for which the records in the rising stage are complete yields a value for the constant. The values so obtained are fairly divergent, due to errors in the observed discharges, but the effect of these can be eliminated by taking the mean of several floods, since on the Sobat inflow is almost completely recorded. The preliminary results obtained in this way indicate that the average increase in width of the upper Sobat is approximately equal to 50 times the square of the average rise from low level.

There are three ways of checking this value, which it will be remembered is obtained solely from a consideration of the losses at the end of the rising stage and of the height of this, no account being taken of the losses *during* this stage or of the gains in the falling stage. In the first place a check can be made from the earlier air survey maps in spite of their lack of contours. These maps show an area alongside both rivers marked as 'permanent marsh,' and on the White Nile comparison with the cross sections indicates that this coincides closely with the maximum area inundated during an average flood. On the Sobat this average maximum flooded area can be

calculated from the mean gauge readings by using the constant of the bank profile, and the result is within a few per cent of the value obtained by scaling the area of 'permanent marsh' off the air survey map.

The second check on the accuracy of this value of the parabolic constant is obtained by a consideration of the falling stage. If this assumed form for the idealized trough is correct it should give on the average not only the volume of water stored and absorbed during the rising stage but also the correct value for the amount of water released from the side basins during the falling stage, less the amount lost by evaporation. In fact it is found that it does so within a few per cent. and the net loss at the end of the cycle is found in the lean of several years to be within a few per cent of the average observed loss. This indicates also that the depths and areas used in calculating evaporation and absorption are unlikely to be seriously in error.

Finally, if the whole theory is correct, the use of this constant and the assumption of absorption rates equivalent to those found empirically on the White Nile ought to give to the whole curve of cumulative computed loss on the Sobat a form close to that of the cumulative observed loss when this has been corrected for observed discharges into and out of the tributaries. In fact, as may be seen from Fig. 5, in the averages of seven floods the correspondence is very close. Once the initial step of assuming an idealized trough with parabolic bank profiles has been taken it will be clear that lack of measured cross sections on the Sobat is less of a handicap to detailed analysis than that caused by lack of complete records of inflow on the White Nile, because the shape of the trough may be assumed to remain constant from one year to another, while inflow is known not to do so; and moreover on the White Nile inflow cannot be correlated at all reliably with any recorded feature of the flood. Thus in fact the analysis of the Sobat flood, which appeared at first sight to be an insubstantial structure based on the slightly hypothetical results of the White Nile analysis, seems likely to become the keystone which strengthens and completes the whole edifice of the investigation.

I wish to acknowledge the assistance of the Sudan Government, and of the Leverhulme Trustees, which made this investigation possible.

APPENDICES.

A. The Equations of the White Nile Flood Cycle

Let Q_u and Q_l be the total observed discharges at the upper and lower ends of a reach during any stage of the flood under consideration,

Let V_{max} and V_o be the trough volumes at the peak of the flood and during the low stage ; let A be the loss by absorption, E and E' the losses by evaporation during the rising and falling stages respectively, and R the gain by rainfall, which takes place during the rising stage only.

Then if it is assumed that there is no inflow we shall have for the rising stage of the flood :—

$$Q_u - Q_l = V_{max} - V_o + A + E - R \quad (1)$$

and for the falling stage :—

$$Q_l - Q_u = V_{max} - V_o - E' \quad (2)$$

And from these we can derive the quantity of water absorbed by the flood plain as follows :—

$$A = Q_u - Q_l - (V_{max} - V_o) - E + R \quad (3)$$

If A is then divided by the maximum area inundated during the flood (*i.e.* the maximum surface area less that of the low level channel) we shall have the average depth of water absorbed by the flood plain.

The quantity of water evaporated during the dry falling stage may similarly be derived from equation (2) as follows :—

$$E' = V_{max} - V_o - (Q_l - Q_u). \quad (4)$$

If E' is divided by the sum of the surface areas during all the ten day periods of the falling stage, and then by ten, the result will be the average evaporation depth per day.

B. Calculating the Parabolic Constant of the Sobat's Idealized Trough.

Let h be the average rise above low level at any stage, and K the parabolic constant.

Let W_o be the low level width and L the length of the reach.

Then the surface width W for a rise h will be :—

$$W = W_o + 2.K.h^2 \quad (5)$$

and the cross section area above low level will be :—

$$h(W_o + 2.K.h^2)dh = W_o h + 2/3.K.h^3 \quad (6)$$

The trough volume of the reach held above low level will be :—

$$V_h - V_o = L(W_o h + 2/3.K.h^3) \quad (7)$$

and the surface area will be :—

$$L (W_o + 2.K.h^2) \quad (8)$$

In both cases the first term in the brackets refers to the main or low level channel and the second to the flood plain.

If these equations are combined with (1) above we can derive the cross section of the reach from the observed discharges at its ends as follows, assuming that the average maximum rise along the reach is H and the assumed absorption depth is D . We shall have :—

$$Q_u - Q_l = L(W_o H + 2/3.K.H^3) + 2.L.D.K.H^2 + E - R \quad (9)$$

Sufficiently accurate values for E and R can be obtained by using a preliminary value of K to work out surface areas for each ten day period during the rising stage, multiplying these by the corresponding depths of evaporation and rainfall, and then summing the results algebraically. Qu, Q1, Wo, L, H, E, and R are then known, and D is taken from the previous analysis (equation (3) above.)

The equation (9) may then be used to derive a value for K in each year as follows :—

$$K = (Q_u - Q_1 - E + R - L.W_oH) / 2L (1/3 H^3 + D.H^2) \quad (10)$$

-
- (1) WRIGHT, J. W. "Some Characteristics of the White Nile and Sobat Flood Plains." *Nature* 164. p. 926.
- (2) WRIGHT, J. W. "The White Nile Flood Plain and the effect of the Proposed Control Schemes." *Geog. Jour.* CXIV pp. 173, 190.
- (3) HURST, H. E. AND PHILLIPS P. "The Nile Basin" Vol. I Cairo 1931.
- (4) BUTCHER, A. D. "Sobat Hydraulics" (Privately Printed by Egyptian Government 1939.)
- (5) HURST, H. E. AND PHILIPS, P. "The Nile Basin" Vol. II, Introduction.
- (6) WAKEFIELD, R. C. "Notes on the Fixing of Astronomical Positions." *Empire Survey Review* 24 p. 79 (1937).
- (7) WRIGHT, J. W. "Air Survey in the Sudan" *Sudan Notes and Records* XXX pp. 58-76 (1949).
- (8) HURST, H. E. BLACK R.P. & SIMAIKA, Y.M. "The Nile Basin" Vol. VII "Future Conservation of the Nile", Cairo 1946.
- (9) DIRECTORATE GENERAL SOUTHERN NILE "The Veveno-Pibor Scheme" Cairo 1932.
-

ملخص

يصف هذا المقال بحثاً هيدروليجياً لنهرى النيل الابيض والسوبات يقوم على المعلومات الموجودة ولكنه يتوصل اليها بطريقة تخالف الطريقة المألوفة فهو يخلص وصف نظام النهرين والطرق المستعملة للحصول على المعلومات ومدى ما كانت تستفيده من هذه المعارف كل من مصلحة الري المصرى وفرقة ابحاث جنقلى السودانية واخيرا يصف المقال المراحل الثلاثة لبحث المؤلف نفسه وهى اولا عمل تقدير للمساحات التى يغمرها فيضان النيل الابيض فى مناسيب مختلفة ثم تطبيق هذه النتائج لعمل تحليل لدورة فيضان النهر واخيرا تطبيق نفس الطريقة ل تحليل للحصول على دورة فيضان نهر سوبات ولعمل تقدير لشكل مجراه

INSECTS AND GRAIN STORAGE IN THE SUDAN

By H. S. Darling

(Presented to the Philosophical Society at its 37th. Ordinary Meeting on November 21st 1950.)

Introduction

The problem of grain storage is a complex one, affected by many factors. It is as much a physical problem as a biological one, and in the past progress has tended to be one-sided through undue concentration of research on the biological aspects only. Much time has been spent in studying the biology of insects which are usually the most obvious and dramatic factors causing serious loss in stored grain, but in most cases too little attention has been paid to the physical and ecological conditions which make possible the outbreaks of these destructive pests.

During recent years scientists, especially in England and in Australia, have been making detailed studies of the general principles, both biological and physical, which are the basis of good grain storage. Foremost amongst these workers is Mr. T. A. Oxley of the British Department of Scientific and Industrial Research, who visited the Sudan last year. Much of the information in this paper derives from his book on grain storage published in 1948 ¹, and from his recently published report on grain storage in East and Central Africa ². This paper also owes a debt to Dr. Coyne who was on the scientific advisory staff of the Middle East Supply Centre during the Second World War, and who has given valuable advice on grain storage in the Sudan.

Insect pests are the direct cause of most of the loss that occurs in stored grain in the Sudan, and in this paper it is hoped to give a brief account of the more important grain insects and to discuss them and their control in relation to the physical factors which affect grain storage. By grain is meant cereal seeds, including millets, wheat and maize.

The importance of the problem needs little emphasis. The necessity of holding reserves of food as insurance against famine becomes more grave when viewed against the background of a doubtful international situation and a mounting locust outbreak. No threat to such famine storage can

¹. *The scientific principles of grain storage* by T. A. Oxley ; Northern Publishing Company Limited, Liverpool, England, 1948.

². *Grain storage in East and Central Africa* by T. A. Oxley ; His Majesty's Stationery Office, London, 1950.

be ignored. Furthermore, increases in the efficiency and quantity of agricultural production in the Sudan, which must accompany current increases in population, and which must precede further social and economic advancement, will most probably involve increased grain production in the south. If full benefit is to be won from this increased production, it is essential that ways be found to store this grain safely until it can be used to the best advantage.

This paper is based on three years experience in the northern Sudan and on three years in Uganda where conditions approximate to those obtaining in the southern provinces of the Sudan.

The commoner pests of stored grain in the Sudan.

Individual grain seeds are protected by a relatively tough seed-coat which acts as a barrier against insect attack. Pests are accordingly divided into two classes:—

- (a) Primary pests which are able to penetrate the seed-coats of otherwise undamaged grain particles.
- (b) Secondary pests which are unable to penetrate the seed-coat and which normally depend on primary pests or threshing tools to break the grain and allow them to reach the kernels.

The main known primary pests in the Sudan comprise six species of insects, three beetles and three moths. These are as follows:—

- The Rice Weevil, *Calandra oryzae* L. (Curculionidae).
- The Lesser Grain Borer Beetle, *Rhizopertha dominica* F. (Bostrichidae).
- The Khapra Beetle, *Trogoderma granaria* Everts (Dermestidae).
- The Angoumis Grain Moth, *Sitotroga cerealella* O. (Gelechiidae).
- The Rice Moth, *Corcyra cephalonica* H. (Pyralidae).
- Unidentified grain moth, *Ephesia* sp. (Phycitidae).

All six species probably occur throughout the more humid areas of the Sudan, including Equatoria, Bahr el Ghazal and Upper Nile Provinces, the Nuba Mountains, the southern stretches of the central rainlands and the Red Sea littoral zone. In these areas it would appear that *Calandra*, *Sitotroga* and *Corcyra* are the more destructive. In the dry northern Sudan only two primary pests are common, namely *Trogoderma* and *Rhizopertha*, of which *Trogoderma* appears to be the more important.

Known secondary pests include the following beetles:—

- Flour Beetles, *Tribolium* spp. and *Latheticus* spp. (Tenebrionidae).
- Saw-Toothed Grain Beetles, *Oryzaephilus* spp. (Cucujidae).

Flat Grain Beetles, *Laemophloeus* spp. (Cucujidae).

These secondary pests appear to be generally distributed throughout the Sudan, but are more plentiful in areas of higher humidity.

Notes on the Biology of the commoner pests of stored grain

(a) The Rice Weevil, *Calandra oryzae*.

This pest, which is world-wide in its distribution, is a small dark brown beetle about two to three millimetres long. In tropical heat it is active and capable of flying for distances of at least a mile. Like all weevils its head is drawn out into a snout or proboscis bearing the mouth parts at the distal end. By means of these mouth parts the weevil tunnels into the grain.

Female weevils bore small holes in the grain and lay a single egg in each. The hole is then plugged and sealed with a mucilaginous substance secreted by special glands. The egg hatches in a few days to give a small legless grub or larva which tunnels inside its grain particle, feeding on the kernel. It remains hidden from the outside and never leaves the grain particle in which the egg was originally laid. The larva grows rapidly, moulting four times before finally changing into the resting stage or pupa from which the new adult eventually emerges. This new weevil rests for a few days inside the grain, which has been largely hollowed out by the feeding of the larva, and then eats its way to the outside. From egg to adult takes about three or four weeks under optimum conditions.

This pest is best suited by a temperature of 27° C — 30° C (80° F — 86° F), an atmospheric relative humidity of 70% — 80% and a grain moisture content of 15% or more. Nearly ideal conditions for *Calandra* are provided in much of Equatoria. This weevil, however, can multiply at lower humidities and grain moisture values than those just quoted. It is a major pest at Port Sudan where the annual mean relative humidity is only 55% and where air-dry grain has a mean moisture content of about 11% — 12%. It is not able to flourish at humidities lower than 50% or in grain with moisture contents below 10% and it is therefore rarely seen in the grain stores of Khartoum and Northern Provinces. When it does occur in the dry northern Sudan, it is usually in consignments of grain brought in from more humid areas and it disappears as the grain comes into equilibrium with local conditions.

By reason of its powers of flight, *Calandra* is able to attack grain in the field before harvesting, and crops often come into store with a small initial infestation derived in this way.

(b) The Lesser Grain Borer Beetle, *Rhizopertha dominica*.

This beetle is found all over the temperate and tropical regions of the world. It is about the same size and colour as *Calandra*, but instead of having a long head drawn out into a proboscis, it has a short head which is carried face downwards hidden under the front of the thorax, giving it a beheaded appearance.

The eggs are laid on the grain surface or in the dust and debris lying between the grain particles. Hatching occurs in a few days and the larva makes its way inside a grain particle, either through the holes made by the adults feeding, or by direct penetration of the seed coat. Once inside the kernel it tunnels and feeds in the same way as the grub of *Calandra*, completing its development in the seed which it first entered. When fully fed, the larva changes to the pupa from which the adult eventually emerges and eats its way out of the grain particle to repeat the life cycle. Under favourable conditions from egg to adult takes about a month.

The optimum ecological conditions for this pest are not known precisely. It can withstand much more heat and desiccation than *Calandra* and it occurs naturally all over the Sudan, being common in the hot, dry north. Its metabolic activity appears to be low, and under the same conditions its rate of carbon dioxide production is only half that of *Calandra*. Under Sudanese conditions it rarely appears to cause major damage itself, but it probably plays an important part in encouraging the attack of secondary pests by breaking undamaged grain.

(c) The Khapra Beetle, *Trogoderma granaria*.

This beetle is about three millimetres long, is oval in shape, and is brown in colour. The adult is not very active and does not appear to fly readily; it is doubtful if its wings are functional. It eats little if at all, and it probably lives on reserves of food stored up during the larval stages. It causes no direct damage to stored grain.

Eggs are laid among the grain particles, and these hatch to give larvae which are the destructive phase in the life history of this pest. These larvae are yellow-brown in colour, often showing an orange or pink tinge. They are covered with long hairs, many of which are armed with minute barbs. They have powerful jaws with which they eat irregular holes in the grain particles. They do not confine themselves each to one grain particle for their development, like *Calandra* and *Rhizopertha*, but they move freely among the grain and each larva may damage several seeds.

Precise data on the life history are not available. The length of the larval life and the number of changes of skin which occur in it may vary enormously. Under favourable conditions from egg to adult may only take five weeks, while in unfavourable conditions many months may be

necessary. There may be as few as four larval moults or as many as fifteen. In the absence of food the larvae appear to be able to live for up to five years, becoming quiescent and motionless.

Trogoderma is able to stand higher temperatures and lower humidities than any other known pest of stored grain. It can flourish at a mean temperature of 35 °C (95 °F) and is still able to reproduce at a mean temperature of 39 °C (102 °F). It can breed successfully in grain with a moisture content of 5% or less, and live larvae have been found in kiln-dried malt with a moisture content of only 2%. It does not appear to have as high a reproductive rate as *Calandra* or *Rhizopertha*, but its ability to multiply in hot dry climates where the other two pests either die out or barely maintain themselves, means that it becomes by default the most important grain pest in the northern provinces of the Sudan. Owing to its low reproductive rate, it rarely becomes serious in grain that has not been in store for two or more years, a long period being necessary to allow the presumably small initial infestations to bulk up enough to become of importance. Prior to the second world war grain was rarely held in store for more than one or two years in Khartoum and Northern Provinces. During the past five years, however, stocks of grain have been held for up to four years and *Trogoderma* has appeared as a major problem.

Two points about *Trogoderma* should be noticed :—

(1) The ability of the larvae to survive in the absence of food for several years means that infestations can persist in dirt and debris in crevices in grain stores even in the absence of grain. It is probable that grain is usually infested through contact with dirty stores.

(2) The larvae change their skins frequently, and each cast skin bears a large number of barbed hairs. Heavily infested grain becomes foul with these cast skins, and unless they are removed before milling the resulting flour may be unsafe for human consumption. The small barbed hairs are not broken up in the grinding and they may cause intestinal irritation. Fortunately the cast skins are very light and may easily be removed by winnowing.

(d) The Angoumis Grain Moth, *Sitotroga cerealella*.

This moth is found throughout the tropical and sub-tropical areas of the world, and also occurs in warmer parts of temperate regions. The adult is small, having a wing spread of about twelve millimetres ; the wings are narrow and the hind pair are characteristically pointed at the tips. The moth, which is yellow or yellow-grey in colour, is itself harmless. It is the larvae or caterpillars which cause the damage. The adult is an active flier and grain is frequently infested in the field before it is harvested.

The life history is similar to that of *Rhizopertha*. The female moths lay their eggs among the grain. These hatch in a few days to give minute caterpillars which are able to eat through the unbroken seed coat and enter whole grain particles. Once inside a seed, the caterpillar tunnels in the kernel remaining invisible from the outside. It feeds and grows, changing its skin four times. When fully grown, it eats its way towards the surface and makes an exit hole which it covers over with bran and silk. It then pupates and the new adult, on emerging from the pupa, breaks its way out of the seed through the door previously prepared by the larva. During its development the larva remains in the seed which it first entered. From egg to adult under favourable conditions takes four to five weeks.

Like *Calandra*, this pest is best suited by humid conditions and moderate tropical temperatures. Its distribution in the Sudan corresponds to that of *Calandra*. It has a high reproductive rate, and since it commonly infests grain in the field before going into store, infestations get established early in the history of each consignment.

(e) The Rice Moth, *Corcyra cephalonica* and the grain moth, *Ephestia* sp.

These two moths are sufficiently alike in habit, size and appearance to be discussed together. They are small and grey with a wing span of about 25 millimetres. As in the case of *Sitotroga*, the adult moths are harmless; it is the larvae or caterpillars which cause the damage. The eggs are laid among the grain and they hatch to give small caterpillars which attack the grain particles in much the same way as do the larvae of *Trogoderma*. They move freely among the grain and in the course of its development each caterpillar may damage many seeds. As they move about they spin tunnel-like webs of silk which become foul with dust and excrement giving an unclean appearance to the grain.

No data are available on the life histories of these moths but it is probable that from egg to adult takes about eight weeks. Like *Calandra* and *Sitotroga* they are confined to the more humid areas of the Sudan. In addition to the direct loss caused by their feeding and by attack of secondary pests which they encourage, the caterpillars of *Corcyra* and *Ephestia* reduce the value of the grain which they infest by fouling it with dirty webbing.

(f) Secondary Pests of Stored Grain.

These occur in broken grain and may also be found in grain products such as flour, corn-flour, semolina, oat-meal, breakfast cereals and similar commodities. They may also be found in dried fruit.

Tribolium spp. are red-brown beetles about three to five millimetres long. They are the beetles commonly found in flour, to which they give a characteristic taint. *Latheticus* spp. are very similar to *Tribolium* but

are rather paler in colour and are able to stand higher temperatures and lower humidities. They are relatively common in stored grain in Khartoum and Northern Provinces.

Oryzaephilus spp. are called "Saw-Toothed Beetles" because of the serrations found along the edges of the thorax. These beetles are about three millimetres long, are brown in colour and are narrow and flat in shape. *Laemophloeus* spp. are among the smallest beetles found in stored grain, measuring less than two millimetres in length. They are flattened, have long antennae, and are red-brown in colour. Both *Oryzaephilus* and *Laemophloeus* belong to the family Cucujidae and representatives of these two genera are suspected of being able to act as primary pests under certain conditions which are not yet fully understood.

In all these secondary pests, eggs, larvae, pupae and adults are found free among the grain particles.

Factors affecting the incidence of insect pests in grain.

(a) Size of the grain particles.

In three of the six primary pests which have been discussed, the larval stages are passed inside a single grain particle. These three pests are *Calandra*, *Rhizopertha* and *Sitotroga*. If the grain particles are too small to provide the minimum quantity of food needed for larval development, reproduction is impossible and infestations fail to establish themselves.

Telebun or Finger Millet (*Eleusine coracana*) has a very small particle size and no record is known of any of the three pests mentioned above breeding in this grain. This is not due to lack of opportunity since *telebun* is usually cultivated in the damper tropics where these pests abound. It is significant to note that this grain has long been used as a famine reserve in parts of Uganda. The unthreshed heads are sun-dried and are then stored in *sueibas* (racks for storage). They keep for up to three or more years in spite of the high atmospheric humidity and at the end of this period are usually free from insect damage. African consumers say, however, that after two years in store the grain develops a bitter taste and becomes unpalatable.

Dukhn or Bulrush Millet (*Pennisetum typhoideum*) also has a small seed and it is unlikely that these three pests are able to breed extensively in this grain. In the government stores at Khartoum North, *dukhn* remains free from attack by *Rhizopertha* even though this pest may be present in large numbers in neighbouring consignments of *dura* Millet (*Sorghum vulgare*). The same *dukhn*, however, is readily attacked by *Trogoderma* whose development is not limited by the particle size of the grain.

(b) The moisture-content of the grain.

This is probably the most important single factor in grain storage. Viable grain respire slowly ; the lower the moisture-content, the more dormant the embryo and the lower the rate of respiration. At moisture-contents of 15% and under, the respiration of grain is a negligible factor. At high moisture-contents, however, the rate of respiration is increased ; and since respiration produces both heat and moisture the process is self encouraging. Damp grain left in an enclosed space may conceivably raise its own moisture-content high enough to bring about germination.

In practice the picture is never so simple as just suggested. A complication which always appears is the process known as " mould heating." This is caused by fungi which are found immediately below the seed coat of the grain particles. At low moisture-content values these fungi are dormant. At moisture-contents of 14% or over they may become active and by their respiration may start to break down the food reserves of the grain, liberating heat and moisture in much larger quantities than those produced by the respiration of the grain itself. The moisture so produced is absorbed by the grain making it damper still, and this, together with the rise in temperature, encourages further fungal activity and the process continues in an ascending spiral until the damp and steaming grain reaches temperatures of up to 65° C (150° F). These temperatures eventually kill the fungi and the process stops, but not before the grain has also been killed and has become sour, discoloured and useless for food.

The phenomenon of mould heating has long been known, but the discovery of the causative agents is relatively recent. Much investigation is still needed to elucidate the problem and to define the conditions under which the fungi become active. At present it may be said that they never become active in grain that has a moisture content of 14% or less, and that they are more likely to become active at higher temperatures. These moulds have been found in wheat, maize and rye. Preliminary work by the Botanical Section at the School of Agriculture, Shambat, suggests that they are almost certainly present in *dura* millet also.

It is against this background of the behaviour of grain in relation to its moisture-content that the activity of insect pests must be considered. Grain with less than 14% of moisture may be free from risk of mould heating but it is by no means safe from insect attack.

Of the six primary pests common in the Sudan, four are best suited by higher grain moisture values. These are *Calandra*, *Sitotroga*, *Corcyra* and *Ephestia*. At moisture-contents of 12% and over they flourish and, provided temperatures are suitable, may cause great damage. At 10% — 12%

moisture-content they are still able to reproduce but their activity is reduced. At less than 10% moisture-content survival becomes difficult. It is thought that in such dry grain there is not enough water for the requirements of the insects and that they can only live by altering their physiology to use the water produced by the oxidation of carbohydrates and fats inside their tissues. This change in physiology is reflected in a lowering of the rates of growth and reproduction to such an extent that these pests cease to be an economic factor.

Of the other two primary pests, *Rhizopertha* is able to infest grain with from 8% moisture-content upwards. This range covers all the values likely to obtain in the Sudan and this pest is universally distributed. Little is known about the moisture requirements of *Trogoderma*, but it appears to be specially fitted for life in very dry grain. It has not a high reproductive rate, but its ability to multiply in grain at moisture-contents of 8% and less establish it as the most important pest in the dry northern Sudan. It must not be thought, however, that *Trogoderma* is unable to survive in humid conditions. A consignment of *dura* millet infested with this pest was recently sent from Khartoum to Juba. In the damp climate of Equatoria the infestation, so far from dying out, actually increased and did considerable damage to the grain. Also, in northern Nigeria in a climate very similar to that of Malakal, *Trogoderma* has been recorded as a major pest of stored groundnuts.

To summarise : grain above 14% moisture-content is liable to mould heating which usually results in the complete loss of all the affected grain. Damage from all six primary pests may be expected in grain above 10% moisture content and the probability of serious loss increases with rise in moisture-content. Grain below 10% moisture-content is threatened by *Rhizopertha* and *Trogoderma* only and the probability of the latter being the major cause of damage increases with decrease in moisture-content.

Insect pests may sometimes initiate mould heating. Grain at moisture-contents of 13% — 14% in the absence of insect life could be considered safe from risk of mould heating. Such grain however, is very susceptible to insect attack and infestations may be expected to develop unless checked by fumigation or insecticidal dusts. These infestations by their respiration produce heat and moisture. This moisture is absorbed by the grain and this, coupled with the rise in temperature may be sufficient to initiate the process of mould heating, which once started continues itself without further aid.

The question is sometimes asked, "Is it the moisture-content of the grain which affects the pests, or is it the humidity of the surrounding air?"

This question is difficult to answer because the two factors are interdependent and cannot be separated. Moisture in air-dry grain is in equilibrium with water vapour in the surrounding air, and for any value of atmospheric relative humidity the grain will have a constant corresponding value of moisture content. Data have been worked out for wheat, oats, barley and maize, and it has been shown that all four types of grain come into equilibrium with the same atmospheric relative humidity at the same value of moisture content. Full data are not yet available for the food grains of the Sudan, but preliminary work at Shambat suggests that *dura* and *dukhn* millets behave similarly to wheat, maize and the others.

Air-dry grain in store will therefore have a mean moisture content which may be expected to correspond to the mean atmospheric relative humidity. This suggests that if the meteorological data for any locality is known, the approximate mean moisture content of air-dry grain in store in that locality may be deduced. The expected annual mean moisture content of air-dry grain in several centres in the Sudan has been calculated and values are set out below :—

Locality.	Annual Mean Relative Humidity at 8.00 a.m.			Expected Moisture Content of Air-Dry Grain.
			%	%
Atbara			29	8
Khartoum			38	9
Wad Medani			43	9-10
El Obeid			46	9-10
Port Sudan			55	11-12
Malakal			56	11-12
Juba			74	14

These figures suggest that grain at Atbara and Khartoum is safe from all types of damage except attack by *Trogoderma* and *Rhizopertha*. Grain at El Obeid and Wad Medani, representing the northern fringe of the central rainlands, is free from risk of mould heating, but is susceptible to attack by *Trogoderma* and *Rhizopertha*, and is at the lower limit of the moisture range in which attack by the other four primary pests may be expected. Grain at Port Sudan and Malakal is free from risk of mould heating but is susceptible to attack by all six species of primary pests. Insect damage is likely to be a limiting factor in these storage centres. Grain at Juba, unless artificially dried, must be regarded as very susceptible to insect attack, especially *Calandra* and *Sitotroga*, and also as susceptible to mould heating.

Mould heating is such a destructive phenomenon that it is worth attempting to define the areas in which it may be expected to occur in air-dry grain. In theory the limit is the line marking areas with a mean annual atmospheric relative humidity of 75% or over, and in the Sudan such areas are confined to the southwestern frontier of Equatoria Province; Juba, Yei, Meridi and the Yambio Scheme are all affected. In practice however, a safety margin must be allowed to cover climatic fluctuations and it is probable that 65% mean annual relative humidity is a more suitable limit. It is tentatively suggested that the dividing line may run from Akobo south-west to Bor and then north-west through Yirol, Rumbek, Tonj and Wau. South of this line the possibility of mould heating should not be ignored, and large scale storage in bins or silos should not be attempted unless the grain has first been artificially dried.

(c) Grain temperature.

Grain is a very poor conductor of heat, being up to ten times as effective a heat insulator as concrete. Any heat generated in the middle of a bulk of grain is unable to escape and accumulates, resulting in a rise in grain temperature.

All living and respiring materials produce heat. Grain itself respire but under conditions prevailing in normal storage the rate of respiration is so low that a negligible amount of heat is produced. The same is not true of insect infestations. They generate considerable amounts of heat, and if infested grain is left undisturbed, the accumulation of this heat will eventually raise the temperature of the mass to about 40°C (104°F). At this level, sustained insect life is no longer possible: the insects die out and the rise in temperature stops. The infestation is killed by the heat which it has itself produced. In a bulk of infested grain, this production of heat eventually results in the insects being confined to the perimeter where heat loss lowers the temperature sufficiently to allow pests to live and breed. The centre of the bulk remains insect free at a mean temperature of about 40°C.

The heating of grain by insects is a very common phenomenon, more so, perhaps, than is generally realised. It never raises temperatures higher than 42°C and appears to have no harmful effect on the food value of the grain. Provided the grain has a moisture content of 12% or less, it may be regarded as a beneficial process, since it confines insect attack and damage to the outer layers of grain, a mass thus protecting the grain in the central core.

Surprisingly small infestations are able to generate enough heat to sterilise a mass of grain in this way. It has been calculated that two weevil larvae per pound of grain are sufficient, over a period of months, to bring

about this rise of temperature to about 40°C. From a practical point of view such an infestation would be regarded as negligible.

(d) Carbon dioxide concentration in the inter-granular air.

Little is known about this. It used to be widely believed that if grain with less than 14% of moisture were enclosed in a hermetically sealed container, the accumulation of carbon dioxide produced by the respiration of the grain and any insects present would eventually kill the latter and prevent further damage. It has been found, however, that grain pests can stand surprisingly high concentrations of carbon dioxide (of the order of 10%) if allowed to acclimatise themselves gradually. It is possible that where insect infestations have eliminated themselves under conditions approximating to hermetically sealed storage, heat production rather than carbon dioxide accumulation has been the lethal factor. At the same time, it is possible that carbon dioxide accumulation may play a large part in controlling insect infestations in *matmura* or pit storage and more investigation of this point is needed.

Control of insect pests in stored grain by suitable management.

(a) Movement of grain from humid to dry areas.

Air-dry grain in a humid locality will have a high moisture-content and will therefore be susceptible to insect attack. If the grain were moved to a dry area, the resultant fall in moisture content would greatly reduce the probability of insect damage. This method of control is, in fact, practised in the Sudan. Wheat arriving at Port Sudan is usually infested with *Calandra*, and infestations usually increase in the warm humid climate of the Red Sea coast. Such consignments are moved to Khartoum or Atbara where the dry climate is so unfavourable that the infestations die out.

It should never be forgotten that Khartoum and Northern Provinces constitute the most suitable area of the Sudan for grain storage. In the low humidities which prevail in these provinces, the only primary grain pests which can survive are *Trogoderma* and *Rhizopertha*. Their reproductive rate appears to be so low that storage of air-dry grain for up to two years is safe if reasonable precautions are taken to ensure that the grain is put dry into a clean store in which it is adequately protected from rain damage. Safe storage for longer than two years is possible but probability of loss through insects increases with increase in length of storage period.

The question of loss in weight through fall in moisture content must not be forgotten. When dealing with large quantities of grain, a loss of three or four per cent of moisture may represent a loss of several hundred tons of grain. If grain prices are high this may be a matter of considerable importance.

(b) Making use of heat generated by insect infestations in the grain.

At moisture contents of 12% and less, it is advisable to encourage insect infestations to eliminate themselves as far as possible by their own heat production. To ensure this, bulk storage of loose grain, as distinct from storage in bags, is to be preferred since it gives a more continuous mass of grain and improves heat conservation by reducing ventilation of the mass. As much grain as can conveniently be handled should be bulked together, since the larger the bulk, the smaller the proportion of outer grain in which heat loss allows infestations to develop.

Care must be taken to prevent contact with moisture, and bulk storage of loose grain combined with protection from rain is most effectively carried out in bins. Such storage is traditional in the northern Sudan, the bins being either underground pits or *matmuras*, or above-ground masonry structures. These native systems, though evolved empirically, are correct in principle and cannot easily be bettered.

c) Grain drying.

Grain in bulk does not quickly respond to atmospheric changes in temperature and humidity. If a mass of grain is enclosed in an air-tight bin it will take months for it to be affected by surrounding climatic changes. This can be made use of in the humid climates of the southern Sudan, where if grain is dried to a moisture content of 10% — 12% and is then stored in an air-tight bin, its moisture content will remain at this low level or for several months before slowly coming into equilibrium with the high relative humidity of the surrounding air.

On a small scale, grain drying in the southern Sudan may be carried out by sunning during the dry season months of December, January and February, when the relative humidity is low enough to allow the moisture content to be reduced to 11% or less. In addition, the exposure to the direct rays of the sun gives grain temperatures of up to 55°C (130°F) which if maintained for an hour or two will greatly reduce any infestation present if not kill it entirely. Grain treated in this way may be put into bins with every prospect of storing well for several months if not longer.

For large scale grain drying special machines are needed. Many of these are now on the market, and the most suitable pass the grain slowly through a blast of hot air at a temperature of about 100°C (212°F). They will dry from one to two tons of grain per hour from 15% moisture content down to 10% — 11%. Such machines perform three functions:—

- (1) The heat of the air blast kills any insects in the grain so that it goes into store pest-free,

- (2) The grain is made unsuitably dry for the major pests of humid areas so that risk of damage through reinfestation in store is considerably reduced.
- (3) Risk of mould heating is eliminated.

Grain driers are the key to safe storage of grain in the more humid tropics. Their introduction into the southern Sudan is at present under discussion and an important point remains to be settled. Such driers usually kill the grain. Is this a major drawback if the grain is to be held for famine reserve? Two conflicting views appear to exist. The first holds that since beer with its high vitamin content is essential for the health of the African community, the viability of the grain must be preserved for malting purposes. The second maintains that in times of famine beer can be temporarily done without. If it proves advisable to store viable grain for famine reserves in the southern Sudan, grain drying equipment working at lower temperatures will have to be used, and this cannot be relied on to kill any initial infestation present.

(d) Grain cleaning.

Mechanical grain cleaning, which shakes and winnows the grain, may be reasonably effective against *Trogoderma*. The larvae of this pest are not firmly embedded in the grain particles from which they can be freed by shaking. Their long hairs then catch in the blast from the winnowing fan and they are swept from the grain by the air current. It has been found that efficient cleaning of heavily infested *dura* millet has reduced the infestation sufficiently to prolong the storage life of the grain by several months.

Control by insecticides.

(a) Inert dusts.

These dusts are usually formulated from very finely ground phosphatic or siliceous substances. They are extensively used in the Sudan at present, a good example being the proprietary compound called "Katelsousse." They are mixed directly with the grain at the rate of about one per cent by weight, and it has been found that in the northern and central Sudan they are often effective in preventing the infestation of stored grain. They do not appear to be able to reduce a heavy infestation if it is already in the grain before the dust is applied, nor do they appear to be very effective against *Trogoderma*. These dusts have the great advantage that they are non-toxic to man and his farm animals.

The insecticidal action of inert dusts is due to their ability to remove from the insect cuticle a very thin layer of wax which is of great importance

in preventing water loss. If this wax layer is broken or rubbed off, the insect dies through desiccation. Since these dusts act by drying the insects to death, it is not surprising that they prove less efficient at higher humidities. They are unreliable at relative humidities of 75% or over, and are of little use in the damp climates of the southern Sudan.

(c) Insecticidal dusts.

The future will probably see great developments in the use of dusts containing new and powerful synthetic insecticides, which will be mixed directly with the grain and will give effective control of all insect pests. At present, the most promising is the gamma isomer of benzene hexachloride (often called Gammexane). This is effective against a wide range of grain pests and its toxicity to man and farm animals is relatively low. Its use in food grain at present is limited by the Public Health authorities who wisely wish to make sure that its consumption in minute quantities, over a period of years, will not result in slow poisoning. Until recently not more than half a part per million by weight could be mixed with food grain and this concentration is too low to be effective. The minimum permissible dose has now been raised to two and a half parts per million and it is expected that further increases will eventually be permitted. At two and a half parts per million this insecticide should give good control of *Calandra* and should be largely effective against all other pests except *Trogoderma* which is relatively resistant to it. Preliminary work at Shambat suggest that 10 parts per million of gamma isomer may give good control of *Trogoderma*.

Research on the use of new insecticides in protecting grain against insect pests is still in its early stages and much work remains to be done. As knowledge of this subject increases, it is likely that the problem of grain storage will be greatly simplified.

(c) Fumigation.

The principle of fumigation is a simple one. Grain is enclosed in a container which is as air-tight as possible and a volatile insecticide is introduced which vapourises and diffuses through the grain, killing the insects. A good fumigant must have good powers of diffusion if it is to penetrate sufficiently to kill larvae hidden inside grain particles.

In the past the most popular fumigant in general use was carbon disulphide. This is effective but has the great disadvantage of being very inflammable. When mixed with air its vapour is explosive and the mixture has a low flash-point. Use of this fumigant has been largely abandoned owing to risk of fire.

In its place many organic substances have been tried, and at present the standard fumigant is a mixture of three parts ethylene dichloride and one part carbon tetrachloride. This mixture is non-inflammable and is effective in killing insect pests. Its powers of penetration and diffusion, however, are not as good as could be desired, and a high dosage is necessary, i.e. 15-25 lbs per 1000 cubic feet of space in which the grain is being fumigated.

It is likely that in the future this mixture will be replaced by methyl bromide. This compound is non-inflammable, is very toxic to insects and has great powers of diffusion. A dose of 1-3 lbs. per 1000 cubic feet gives effective control of all known pests. Its disadvantages are that its vapour is colourless, nearly odourless and very toxic to man. This human toxicity may be delayed in its action. It is possible for an operator to breathe in a lethal dose without realising it, and to collapse and die hours or even days later. Such health hazards present a grave problem.

It must be remembered, however, that all fumigants are toxic to man, and their use is inevitably attended by some degree of risk to the operator. In this risk lies their main disadvantage as far as the Sudan is concerned. To get full advantage from fumigation, expert supervision and suitable buildings are necessary, and the process must be carried out in accordance with the necessarily strict regulations laid down by the Public Health authorities. Expert supervision and suitable buildings are difficult to find in the Sudan. At present the only building in the country that has been specially designed for fumigation is the fumigation chamber of the Plant Quarantine Service at Wadi Halfa. Small fumigation pits, also belonging to the Plant Quarantine Service, are available in Khartoum. As grain storage in the Sudan develops, the erection of silos and other storage buildings will have to be considered; and in designing them, the question of suitability for fumigation will, no doubt, be taken into account.

Summary

- (1) Primary and secondary insect pests of stored grain in the Sudan are listed and brief accounts are given of their biology and of their ecological requirements.
- (2) Factors affecting the incidence of insects in stored grain are discussed. Grain particle size, grain moisture-content and grain temperature all affect the development of insect infestations. It is possible that the carbon dioxide concentration of the inter-granular air may also affect the incidence of pests.
- (3) Control of pests by appropriate management is discussed. Grain moisture-content appears to be of major importance. The dry

northern Sudan is very suitable for grain storage, since in such areas the grain becomes so dry that insect activity is reduced to a minimum. In the humid southern Sudan mechanical grain drying is a necessary preliminary to long term storage.

- (4) An outline is given of control methods making use of insecticides. Inert dusts, chemical insecticide dusts and fumigants are briefly discussed.

SUMMARY OF DISCUSSION

Mr. Bacon stressed a point which was of great importance to the Sudan apart from the direct losses of grain in storage. At the moment the Sudan was using valuable irrigation water to produce food crops of low money value on its irrigation schemes. This practice would have to continue until the Sudan became sure of sufficient production from its rain areas, and this could never be guaranteed because of the uncertain availability of rainfall and exposure to attack by pests. Production of *dura* in schemes such as the Gezira could only cease when storage of two years' crop from raingrown sources could be assured. *Mr. Bacon* asked if pulse crops, which were so susceptible to *suss* (weevil) that they were sometimes attacked in the field, would store better if ground prior to storage. He also asked if the speaker had any remarks to make on the local belief that grain affected with smut keeps much better in *matmuras* than does clean grain.

Mr. Darling replied that with regard to pulse crops, their storage might well in future be affected by applications of Gammexane, which could be mixed with the seed. The seed would still be susceptible to secondary pests, even if ground, but Gammexane might offer some measure of control. He also thought it probable that there was something in the native idea that *dura* smut may act as a deterrent to pests, but investigations into the matter, which had been commenced at Wad Medani, had not proceeded very far.

Dr. Boyns asked the speaker if there was any differential resistance to pests shown by the many varieties of *dura*. He thought that the greater susceptibility of pulse crops might be due to the higher protein content of their seeds.

Mr. Darling replied that the types of pest attacking pulses were very different from those attacking grain. But he thought that different varieties of *dura* did exhibit different susceptibilities to insect attack. In his preliminary work on grain and moisture-content he had found that certain

varieties of *dura* differed by as much as 1% when in equilibrium with the same atmospheric humidity.

Mr. Read asked the speaker if he agreed that the deviation from the mean annual humidity might be equally as important as the mean itself. He quoted the instance of Tokar where the crop is harvested at the time of high humidity and is practically unstorable as it is so susceptible to mould damage. It would seem that over most of the Sudan the crop was fortunately harvested at the period of low humidity.

Mr. Darling thought that *Mr. Read* had raised an important point in that in some cases the relative humidity at harvest time might be more important than that obtaining throughout the year, but on a long term basis the annual mean would matter more than the humidity at harvest time.

Mr. Corfield referred to the question of grain storage in the southern Sudan. He was interested in the Upper Nile area since the area north of Malakal was likely to become one of the largest rain-grown *dura* areas, and he thought it would be most useful if grain could be stored in the vicinity. This would involve drying the grain, and he wondered whether in the Melut region, where grain was harvested in January and February, at a humidity of 35%, it might not be possible to dry the grain at a lower figure than that quoted by *Mr. Darling*, i.e. 200°F., and thus retain its viability. He also mentioned the practice of storing grain in the head, and asked if any work had been done on the susceptibility to infection of grain stored in the head, as opposed to grain stored in bulk.

Mr. Darling replied that grain driers could be used quite effectively at 125°F. but that the process was much slower. Regarding the possibility of storage of *dura* in the head he pointed out that the glumes surrounding the grain did give some degree of protection, and formed a barrier to attack by insects. The difficulty of such storage was the extra bulk involved.

Mr. Grabham enquired as to the necessity of using viable grain for the production of *merisa* (millet beer), and as to the length of time for which grain could be kept in *matmuras*. *Mr. Darling* replied that viable grain was essential in the manufacture of *merisa* by the native process, but that there were widely different opinions as to the length of time for which grain could be stored in *matmuras*.

Mr. Moir stated that grain could be stored in *matmuras* with no loss of viability for up to six months, but that grain which had been bought and stored in *matmuras* for 18 months had definitely poorer germination capacity.

In reply to a query by *Mr. Disney*, *Mr. Darling* stated that fumigation should be equally effective against those larvae which bore into the grain and seal themselves off. In certain cases several fumigations might be necessary, but very often one fumigation was enough.

ملخص

(١) اورد الكاتب كشفا بانواع حشرات السودان التي تعد اما في طورها الابتدائي او الثانوي كآفة من افات الذرة المخزونه مع نبذ بيولوجيه وايكولوجيه عن حياة كل نوع والبيئة الملائمة لها

(٢) ثم تناول العوامل التي تؤثر على تواجد الحشرات في الذرة المخزونة - فحجم حبة العيش مثلا وكمية الرطوبة المتواجده داخل الحبه ودرجة الحرارة فيها كلها عوامل تهيىء سرعة التعرض للاصابة بالافات وقد يكون لوفرة غاز ثاني اكسيد الكربون في الهواء المخزون داخل الحبه اثر فعال في مدى الاصابة

(٣) ثم بحث الطرق الخاصة لمقاومة هذه الافات واثبت اهمية وجود الرطوبه داخل حبة الذره في هذا الصدد فجو السودان الشمالى مناسب جدا لحزن الذره لانها تجف في مثل هذه المناطق لدرجة تجعلها محصنه الى ابعد الحدود ضد فتك الحشرات اما في السودان الجنوبى يجوه الرطب فمن الضرورى تخفيف الذره بالآلات الصناعيه مبدئيا اذا اريد تخزينها لمدة طويلة

(٤) واستطرد الى بحث موجز عن الطرق المستعمله في مقاومة هذه الافات بقاتلات الحشرات واورد نبذا عن الاتربه الساكنه والمساحيق الكيماوية القاتله للحشرات والتطهير بالبخار

NOTES.

MOGRAKA CHURCH

By P. L. Shinnie

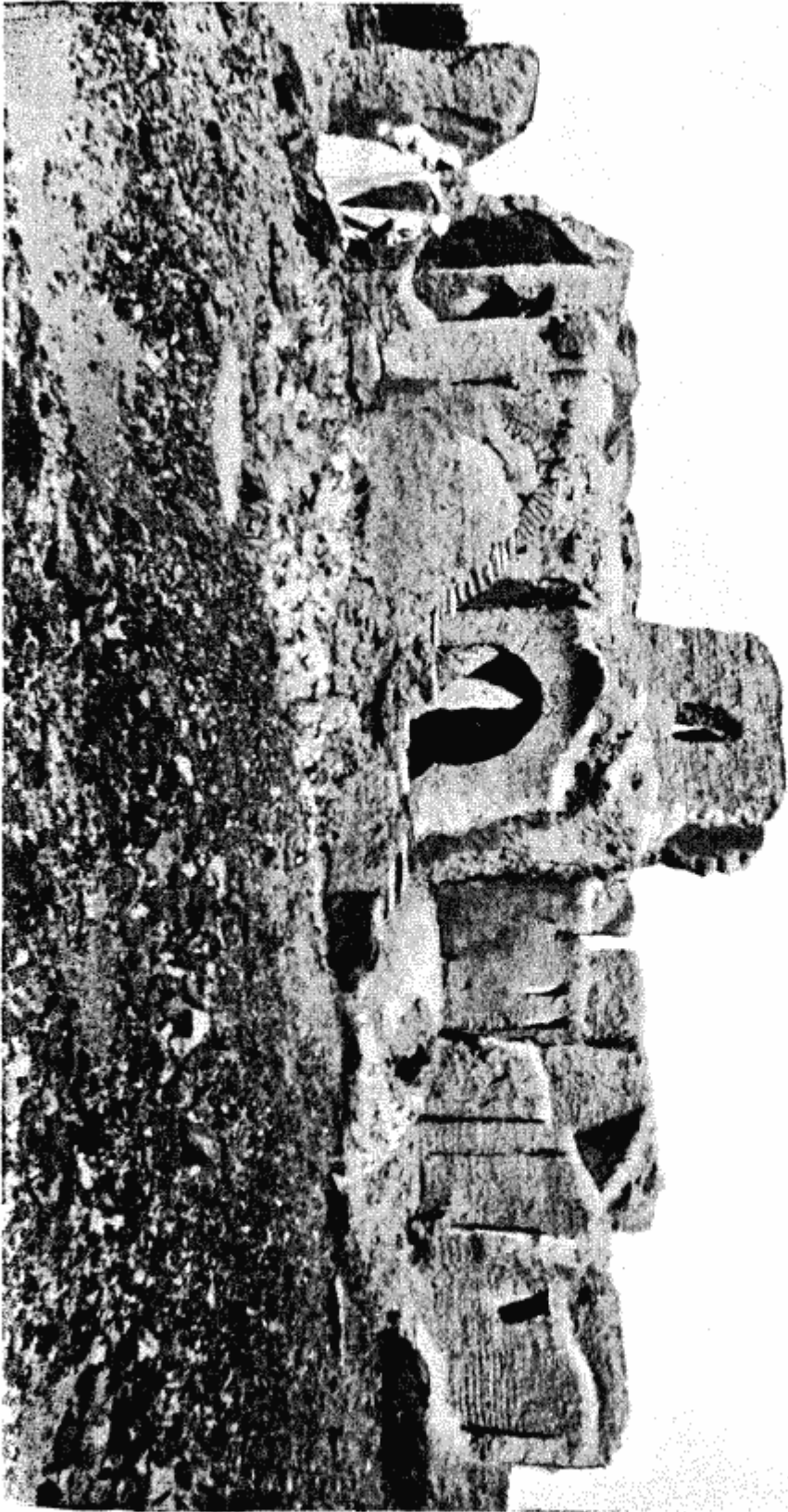
Commissioner for Archaeology.

Monneret de Villard in his *La Nubia Medioevale* under the heading Mograka says merely "Una chiesa in questa localita e segnata sulla carta del Survey, fol 35M." This would lead one to believe that there was considerable doubt as to the existence of this church. In fact it does exist and has been inadequately published, after the appearance of Monneret de Villard's book, by Kirwan in *The Oxford University Excavations at Firka*, where on p. 24 it is briefly mentioned and a small and dim photograph appears as Plate VI, 5.

As this church is one of the very few still standing south of the second cataract and is certainly the best preserved of them, it may be thought worth publishing a new photograph and a plan.

The church stands in a commanding position on a spur of rock above the small village of Mograka, some 100 miles south of Wadi Halfa, and about 300 metres east of the river.

The building itself calls for no special comment ; it adheres closely to the normal basilican type of Nubian church as found in the second cataract area. It consists of the usual nave and two aisles, with the "haikal" or sanctuary at the east end. Part of the tower, originally covered with a dome, still stands. It is built entirely of sun-dried brick, and is in a comparatively good state of preservation except for the disappearance of the outer wall at the south east corner. The total length of the church is 14 metres and its width 9.5 metres. It is therefore considerably smaller than any of the group of churches round Wadi Halfa published by Mileham in "Churches in Lower Nubia", except for the two domed ones at Serra.



EAST AFRICAN INSTITUTE OF SOCIAL RESEARCH

The East African Institute of Social Research which has been projected since 1948 has now been established at Makerere College under the directorship of Dr. Audrey Richards. Works will be carried out in Kenya, Uganda, Tanganyika and Zanzibar and will include sociological, linguistic, economic, legal and psychological studies.

It is intended that the new Institute should carry out work of the type already undertaken by the Rhodes-Livingstone Institute which was established at Livingstone in 1938 and which has a research programme covering Northern Rhodesia, Southern Rhodesia and Nyasaland under the directorship of Dr. Elizabeth Colson. A similar West African Institute of Social and Economic Research will be established at Ibadan College in Nigeria.

The East African Institute of Social Research will be closely associated with Makerere College and will report annually to the Council of that College as well as to the Colonial Social Science Research Council of the Colonial Office. It has, however, its own staff, who will not be engaged on teaching duties, and an independent programme of research.

It is hoped that the Institute will fulfil the following functions :

(a) *The establishment of a centre of African and mainly East African Studies* for the extension of our knowledge of the cultures and languages of the peoples of East Africa and of their present day reactions to modern political, economic and educational policies. The Institute will accumulate and analyse documentary material in the form of books, reports, unpublished manuscripts prepared by its staff and other research workers in East Africa, maps, etc. It will have the great advantage of being able to share the library facilities of Makerere College. It is hoped, therefore, that the Institute will soon be in a position to act as one of the information centres on sociological and economic data about the people and problems of East Africa.

(b) *The conduct of field studies* both of an ethnographic and specialist character. The initial research of the Institute will probably consist of ethnographic and linguistic field studies to be carried out in areas for which we have no up to date descriptive material at the moment, but the staff will be interested from the first in problems as well as in peoples, and will endeavour to pool data collected in different tribal districts so as to throw light on particular problems of theoretical or practical interest. It will

organise periodical conferences for members of its staff and others interested in order to achieve comparative work of this kind. A problem of this sort to which the Institute will devote immediate attention is the comparative study of African political structures in four or five type areas with reference to their adaptation to modern conceptions of local government and the types of present day activity.

(c) *The organisation of experiments in research methods.* It is considered that the time has now come to conduct experiments in those methods of social research which have been or could be most successful in acquiring information on the social and economic problems of East Africa and that an academic body is more fitted than any other to carry out such experiments. Experiments in the techniques of urban social surveys under special African conditions will be made in the conduct of the Jinja social survey listed below. Studies of the success of the application of various psychological tests in different cultural back-grounds would also be of interest, as well as research into the success or failure of various types of welfare measures by means of controlled experiments in different areas.

When the Institute has succeeded in carrying out background ethnographic studies in some type areas, it hopes to experiment in research methods in one or other of these ways.

(d) *The organisation of studies of administrative importance* on behalf of the Government. It is presumed that the Institute will sometimes be asked to undertake field investigations on behalf of the East African Governments as happens in the case of Universities in the United Kingdom and that it will accept such tasks if it has the staff and funds to do so. It may also be able to get information on special projects of interest to Governments in areas where it already has a research officer working.

The Institute will cooperate as closely as possible with Government research departments and has already arranged work on these lines with the Statistical Department of the East Africa High Commission.

(e) *The training and assistance of research workers.* It is hoped that the Institute will be able to provide additional training in research methods under East African conditions for research workers who are new to the country. It should be able to save students a good deal of time by giving them help in the initial stages of their work and possibly, when linguistic studies have been developed, to provide them with some preliminary linguistic training before they go into the field. It also hopes to train African investigators and research assistance.

(f) The Institute will publish the results of the research of its own officers or others working in similar fields.

The appointment of five anthropologists to the staff of the Institute has been made or approved, apart from the Director. One urban sociologist has been appointed and a second post in this field is contemplated. A linguistic post has been advertised and the appointment of a senior economist, a psychologist and a legal expert are under discussion.

The Institute is very anxious to accumulate information on the peoples of East Africa both in the form of published work and unpublished manuscripts. The material that will be useful includes historical accounts of tribal movements ; data on social structure, clan organisation, village organisation, the family, marriage and age grades, etc. ; accounts of local cases or court procedure ; data on modern economic conditions ; material on urban problems.

All inquiries should be addressed to the Director, East African Institute of Social Research, Makerere College, P.O. Box 262, Kampala, Uganda.

THE ADVENTUROUS LIFE OF FARAJ SADIK

By A. C. Hope.

Formerly Commandant of Police, Darfur Province.

The following is a short life history of Faraj Sadik, one of the most interesting Sudanese I have met. After having served under the Turkish regime in the Sudan, and surrendered to the Mahdi, been sold as a slave served through the retaking of the Sudan, been a cook, a mosquito-killer in the sanitary section and a policeman, he ended up as a *ghaffir* (watchman) over a rest-house in western Darfur.

He was still hale and hearty, although minus a tooth or two, and always ready to tell you his past experiences punctuated with exclamations in Italian. His wife of the moment (there must have been dozens in the past) keeps a few chickens and looks after a small garden, both of which are suitable assets to a rest-house keeper. In moments of anger Teeto, as he was known in the Italian mission and to his pals, curses her in fluent Italian which she seems to understand, not that I have ever heard her say more than "Buona Sera".

Now I must let Teeto tell his story in his own words :—

"I Faraj Sadik am a Shatawi (subtribe of the Rizeigat) and so were my parents. I was born at Shakka on the Bahr el Arab, southern Darfur, in about 1281 (1863 A.D.). At that time the Sudan was under the Turks and Ismail Pasha Ayub ran the Sudan from his office in Cairo, his representative being Hassan Pasha Duessa.

"When I was about 10 years old our tribe attacked the Bideiria people and Hassan Pasha came to restore order. He settled the dispute by sending us back to our homes as we had been the aggressors, and forcibly enrolling some of the boys into the Army. I was amongst them and was taken to El Obeid where I was made to learn to blow a bugle. I was in El Obeid about 5 years before I was transferred to Khartoum and went with Uba Bey our Egyptian bandmaster ; there I remained about 6 months, before I went to Kassala with the 4th Coy of the Kassala Infantry Battalion. I only stayed there 4 months. Massawa (Eritrea) was the headquarters of our band and from Kassala I was sent there, and remained 5 years, drawing about 15 piastres per month with rations. About this time rumours came of the rising of the Mahdi and we were ordered back to Khartoum ; we went by sea to Port Suez, then to Cairo—Assuan—Halfa. From Halfa

it was 40 days by camel to Khartoum. At Khartoum I was posted to the 2nd Alaya under Adam Pasha Bideiri and remained there about 10 years, still as a bugler at 15 piastres. We often saw Gordon Pasha, as he frequently inspected his troops who were commanded by Abu Saud Pasha.

"At this time the Mahdi was at Aba Island in the White Nile Province. Sheikh Wad Budar of Umm Duban refused to pay the government taxes so Abu Saud Pasha with Gordon's assistant Rauf Pasha, left Khartoum on S.S. "Burdaice" and "Kawkaw" with 1600 men, and I was one of the buglers. On arrival at Eilafon Rauf Pasha sent a letter to Sheikh Wad Budar commanding him to pay his taxes, but he again refused and said: "I am ready for you but I will not pay". We stayed on the boats for 3 days; then about 160 men were landed to reconnoitre and found a large number of Dervishes nearby. Then another company was sent out and the Dervishes attacked, driving them back to the boats. The gunners opened fire on the attackers but our men were so mixed up that a number of them were killed by our own fire. Only 35 men got back to the boats. Luckily for me I was on duty on board, as 5 buglers were killed. We then hastened back to Khartoum.

"Gordon Pasha when he saw that the whole country was rising under the Mahdi, evacuated all the people he could down the river from Khartoum. About this time General Hicks and Ali Bey Abu Kuka started with an army from Cairo and when they arrived they were encamped south of Khartoum in the Deim. In 1883 Gordon Pasha ordered Ali Bey with a force to go to Bara in Kordofan and Hicks Pasha to proceed to Rahad. The buglers in Khartoum were divided between the two forces and I went with Hicks Pasha's Army. On arrival at Rahad in November, the Mahdi then being at Gedir, the advance party went on to Shekam and made a large thorn zeriba, we remaining at Rahad. Then we advanced and came up with our advance party at Shekam. We took the precaution of putting down round the zeriba iron spikes to prevent the advance of camels or men with bare feet. Then the Mahdi left Gedir and came near to Rahad; he sent a letter to Hicks Pasha saying: "You must turn Muslim, pray as I do and follow me." Hicks replied: "I refuse. Even if the sky falls I have enough bayonets to hold it up and if the earth tries to rise I have a big enough army to keep it down." We were short of water all along the march and as we did not know where the water was we had to rely on guides. One big water fatigue party guided by some Fellatas was led the wrong way and never returned. The Mahdi's army attacked us at about 6 a.m.; we were an easy target in our zeriba and most of us were killed, Hicks Pasha amongst them. He died under a *tebeldi*. At about 7 a.m. two companies of my battalion got through the zeriba and fled towards

Kadara on the road to Dilling. The Dervishes pursued us a little but they were too busy collecting loot to bother about us. Eventually we arrived at Bir Allah and remained 8 days with the Nubas, who fed us.

"After defeating Hicks Pasha at Rahad the Mahdi returned in triumph to El Obeid. We marched towards El Obeid but hearing firing from the town we skirted it by night and made for Bara where we hoped to find Ali Bey Abu Kuka and his army. On arrival at Bara we found it garrisoned by only 4 companies of Ali Bey's Army, two companies of the original garrison of Bara, 600 irregular troops (*Bashbasuks*) under Nur Angara 400 men under Daud, a Turk, and 500 men under Mohammed Agha, Yagub.

"We were surrounded by the Mahdi's followers and remained so for about 6 months ; all the time we had to send out raiding parties to collect food for ourselves and forage for our animals. Soon we had collected all there was to collect round Bara and we had to fall back on mules and horses ; even dogs were killed and eaten. About this time the Mahdi attacked us in force but we drove the Dervishes back killing two Emirs, Sheikh Manna and Sheikh Rahma.

"After a further two months of starvation Nur Angara received a letter from the Mahdi saying : "Join me and come to El Obeid." Nur Angara made a hole in the zeriba one night and tried to get away with his men without my friends' knowledge, but we found out and followed him. We went to El Obeid and arrived there on a tuesday; we were made to pray *en masse* with him. Our party and some Turks were camped alone outside the town. We were with the Mahdi about a month and very much left to ourselves, and an officer of mine, Rizgalla Effendi Nur, suggested we deserted, so 19 of us cleared out one night and took the road back towards Bara. We were caught by some armed Kababish and taken to Kagmar where we remained about 15 days. Then a merchant called Hassan Abu Kort came to the Kababish and we were sold to him at an average price of 60 Megidis. We were then taken, some walking, some riding, to Dongola via Amir Safi, then on to Um Belita and Abu Kussi ; then by boat to Ordi in Dongola, then to the island of Argo. From there we went by foot to Halfa on the east bank of the Nile. But as there were soldiers at Halfa we crossed just above it to the west bank and got on to the *Derb al Arba'in* (Forty Days Road) leaving the river. From there we went to Eshima near Aswan. At a place called Kobania the *omda's* ghaffirs stopped us and would not let us proceed but our master Hassan bribed them and we went on to Bimban where Hassan lived. It is to the west and near to Kom Ombo. Hassan kept his slaves on an island between Bimban and Kom Ombo.

"We were about 3 years on the island watering Hassan's garden and irrigating his crops. One night I was in the cultivation when I heard "Retreat" being sounded. I was wildly excited and ran to tell my officer Rizgalla Eff.; he did not believe me but told me to go across the island to the main stream and see what it was. On the way I met Mohammed Eff. Shaaban, an interpreter, and he told me that there were 4 boats full of the British Army and he belonged to them. He asked me who I was and I told him my story. These soldiers were on their way to Khartoum, so Mohammed Eff. Shaaban told me, to relieve Gordon Pasha. He then took me on board and the O.C. asked me if I could blow a bugle and I said: "Yes". And when I had sounded various calls he said: "Go and call your pals." I ran back to my friends and under cover of darkness we stole on board. We were brought before the O.C. who asked us all about the slave trader Hassan Abu Kort. He told us we were to come with him to Aswan where he would make arrangements with the District Commissioner to have Hassan arrested. On arrival at Aswan I was detailed to go back with the D.C. to arrest Hassan; this we did and found some 25 slaves whom we brought back with us to Aswan.

"We then steamed up the Nile and arrived at the island of Tuti just north of Khartoum on a tuesday at 3.30 p.m. There we found that the Mahdi had entered Khartoum the day before and that we had arrived too late. We turned back down the river and were fired on from Omdurman; we went as far as Abu Teleh (Abu Klea). There the boat was sunk and we had to build a fort.

"Fifteen days later the Mahdi's army under Nur Abu Angara, 'Abd al Rahman Wad al Nejumi, Nur Kenzi and 'Abdel Halim, with 1000 men attacked us; the battle lasted all day and at dusk the Dervishes fled. We worked all night burying the dead and seeing to the wounded and the next morning we retreated towards Korti fighting all the way. We were at Korti about 6 months before we went on to Ordi. At Ordi we collected all the inhabitants and sent them before us to Sid Akasha where we remained 6 months. On this retreat I acted as guide, as it was the way I had come when a slave with Hassan Abu Kort. Soon the railway was completed between Halfa and Akasha by Lord Kitchener and the army returned to Halfa. The English army went back to Aswan but I stayed in Halfa and remained with 4 companies of the 9th Sudanese for 3 months. Our C.O. was Boro Bey; other officers at Halfa were Lewa Hunter Pasha and Oouis Pasha. About this time the 10th, 12th and 13th Sudanese were formed at Halfa. I was posted as bugler to the 11th Sudanese with whom I remained at Halfa for 5 years. Then I went to Aswan and was transferred to my

brother's regiment, the 12th Sudanese ; in 1895 I went with my regiment to Suakin and was there 2 years, then a year in Tokar and then back to Aswan.

"Then I went with the Sirdars' Army (Kitchener) and took part in the battles of Firket, Hafir, Dongola, Abu Hamad, Atbara and finally Omdurman. I only remained in Omdurman 15 days before we were sent to Gedaref in Kassala Province. There we beat Emir Ahmed Fadil Abu Kolega. They kept us in Gedaref 9 months before we returned to Omdurman. After that we went to Kaka on the White Nile, then back again to Dongola, where I was 2 years. In 1902 I was transferred to El Obeid and took my discharge from the Army. Afterwards I went to Khartoum where I was 2 years cook to Slatin Pasha. On leaving him the Italian Mission took me in as cook, where I remained till 1914. In 1914 I got a job as a mosquito-killer in the Khartoum sanitary section and stayed with them till 1918. In 1918 I went with some camels to Darfur and joined the Police in that Province and served with them until 1923. I was then discharged and became gardener in Kuttum where I remained till 1932, when I was given my present job of *ghaffir* at the Kabkabiya rest house.

"I didn't tell you that when I first went to Aswan with the army I was converted to Christianity at the Italian Mission, in fact I was made a Christian by a visiting American Bishop. After that whenever I was near a Catholic Church I used to attend a Mass.

"In 1901 I took leave from Dongola and because I was Catholic I went as servant to a Hungarian doctor, an ear specialist who was with the Army in Italy. We visited Rome and I saw the Pope with my master. Afterwards we travelled to many places, amongst others Turin, Milan, Budapest and Vienna. We passed through the Tyrol and then took ship from Trieste to Palestine. As our leave was nearly up we only visited Jerusalem, but we got back to Dongola on time".

PHILOSOPHICAL SOCIETY OF THE SUDAN
Report upon the 1949-1950 Session.

The following Officers and Committee were elected at the Annual Meeting held on January 10th, 1950 :—

President	G. Andrew
Vice President	A. W. Ireland
Secretaries	L. S. Cobley J. W. Wright
Treasurer	G. C. Wood

Committee

M. Joliffe	G. W. Ogden
M. F. A. Keen	H. Sandon
R. I. Knight	P. L. Shinnie

R. C. Wakefield

The Programme comprised eight lectures and two field days. The monthly meetings were held in the Gordon Memorial College, by kind permission of the Principal, and the titles of papers presented to the Society were as follows :—

- 28th Ordinary Meeting .. Speaker : A. B. Theobald.
 25.10.49 Subject : *The Khalifa 'Abdallahi.*
- 29th Ordinary Meeting .. Speaker : P. L. Shinnie.
 22.11.49 Subject : *The Amara Excavations.*
- 30th Ordinary Meeting .. Speaker : G. W. Ogden.
 27.12.49 Subject : *Some Thoughts on the Measurement of Time.*
- (10.1.50—The Fifth Annual General Meeting of the Society.)
- 31st Ordinary Meeting .. Speaker : E. B. Worthington.
 24.1.50 Subject : *Developments in the Upper Nile Basin.*
- 32nd Ordinary Meeting .. Speaker : E. J. Howell.
 14.2.50 Subject : *A Plan for an Atlas of the Sudan.*
- 33rd Ordinary Meeting .. Speaker : C. A. Britton.
 28.2.50 Subject : *Public Utilities.*
- 34th Ordinary Meeting .. Speaker : A. B. Miskin.
 28.3.50 Subject : *Land Registration in the Sudan.*
- 35th Ordinary Meeting .. Speaker : Miss F. M. Delaney.
 25.4.50 Subject : *The Geology of the Sabaluka Area.*

Two Field Days were arranged, one in December to the Statistical Section of the Department of Economics and Trade, and the second to the Khartoum Automatic Telephone Exchange in February.

Of the papers listed above four are being published in *Sudan Notes and Records*, which now, under its new title '*Sudan Notes and Records incorporating the Proceedings of the Philosophical Society of the Sudan*,' is the official journal of the Society.

PTERIDOPHYTA RECENTLY RECORDED FROM THE SUDAN

By Dr. K. N. G. MacLeay.

Senior Lecturer, School of Science, Gordon College.

During June and July 1947 a journey to Ecuatoria was undertaken to gain some personal knowledge of the vegetation of that part of the Sudan. In the course of this journey Katire and the depression forest of Tallanga were visited and a foot-trek from Gilo to Mt. Kineti was carried out, the return being made from Logoforok via Torit. En route the different types of montane forest were examined and over three hundred specimens were collected, twenty three of them being ferns and fern allies previously unrecorded from the Sudan. Towards the end of July Yambio and Yei were visited which allowed for the inspection of typical gallery forests of the Nile-Congo divide.

In January 1950 the visit to the Imatong mountains and Tallanga forest was repeated for the express purpose of verifying the existence there of certain Pteridophyta. The Acholi hills and Lotti forest were also visited as was the valley of the river Kajiko — a typical gallery forest — near Yei. As this was during the dry weather and most of the ferns were in a dried-up condition, many may have been overlooked but, in spite of the unfavourable conditions, most of the previous records were confirmed and the known range often considerably extended, while a further fourteen species, new to the Sudan list, were collected.

Apart from isolated localities in the northern Sudan such as Erkowit Karora and Jebel Marra the Pteridophyta are confined to Ecuatoria, especially in the montane forests of the south-east, the gallery forests of the Nile-Congo divide and the depression forests. Few people have collected ferns and their allies from the Sudan and the author would be grateful for any further information or material about them with a view to the publication of a further paper on the Pteridophyta of the Sudan.

My thanks are due to Mr. J. K. Jackson and Mr. G. H. D. Williams of the Forestry Division of the Ministry of Agriculture and Forests and to Khalid Eff. Mohammed Ali, Demonstrator in the Department of Botany, Gordon Memorial College, for specimens, information and help.

All plants which could not be identified from the available literature and from the herbarium specimens at Wad Medani were submitted to Mr. A. H. G. Alston of the British Museum (Natural History) for identification and my grateful thanks are due to him for his help.



In the following list, all of which are species hitherto unrecorded from the Sudan, the numbers after a specimen refer to those collected by me, except where otherwise indicated. Where no collector's number is given the specimens were seen and verified but not collected. All relevant material is preserved in the Pteridophyte herbarium in Gordon Memorial College and duplicates have been presented to the British Museum (Natural History) wherever possible.

LYCOPODINEAE

***Lycopodium dacrydioides* Bak.**

Pendulous epiphyte up to 1.5 m. long, hanging from tree branches in the forests of the Imatong mountains, 4,000—9,000 ft., frequent.

Torit : Gilo, Kipia, 47, 47A, 47B, 1947 ; Lerwa, 1950.

***Selaginella abyssinica* Spring**

Creeping terrestrial plant on damp soil in shade of montane forest of Imatong mountains, 3,000—7,000 ft., locally common.

Torit : Katire, Gilo, Dumuso, 48, 48A, 48B, 1947.

***Selaginella versicolor* Spring**

On damp rocks in stream beds in shade of gallery forest, 3,000—5,000 ft., local.

Yei : R. Kajiko, 475, 1950.

FILICINEAE

***Botrychium chamaeconium* Bitter & Hieron.**

Erect fern in swampy ground in deep shade of montane forest, 30 cms. tall, at 6,000 ft., three plants only seen.

Torit : Gilo saw-mills ; 55, 1947.

***Marattia fraxinea* Sm.**

A very large erect terrestrial fern of swampy ground and stream sides in montane forests, to 3.5 m. tall, 5,000—8,000 ft., local.

Torit : Gilo, 87, 1947 ; Lerwa, 1950.

***Osmunda regalis* L.**

Terrestrial fern of damp ground and river banks in montane forest to 1.5 m. tall, 5,000—7,000 ft., local.

Torit : Gilo, R. Ngairigi, 424, 1950.

***Cyathea Deckenii* Kuhn**

Tree fern in swampy ground in montane forest, to 5 m. tall, 5,000—8,000 ft., local.

Torit : Gilo, R. Ngairigi, 86, 1947 ; Dumuso, 1950.

***Cyathea* aff. *Holstii* Hieron.**

Small tree fern of swampy ground in montane forest to 1.5 m. tall at 5,500 ft., only one found.

Torit : Gilo, R. Ngairigi, 92, 1947.

(This plant closely resembles a little-known East African species but may be entirely new to science ; further material is required for complete identification.)

***Arthropteris monocarpa* (Cordem.) C. Chr.**

Creeping terrestrial fern in damp ground in montane forests in deep shade, to 30 cms. tall; 5,500 ft., locally common.

Torit : Gilo, 91, 1947 ; 402, 416, 417, 446, 1950.

***Pteris prolifera* Hieron.**

Erect terrestrial fern in damp undergrowth in depression forest in deep shade, to 1.3 m. tall, 3,000-5,000 ft., occasional.

Torit : Tallanga Forest, 471A, 1950 ; Lotti Forest, 471, 1950.

***Pteris pteridioides* (Hook.) Ballard**

Erect terrestrial fern at edge of streams in montane forest, to 75 cms. tall, 5,000-6,000 ft., local and rare.

Torit : Gilo, R. Ngairigi, 98, 1947 ; 456, 1950.

***Pteris spinulifera* Schum.**

Erect terrestrial fern in damp undergrowth in depression forest in dense shade, to 1 m. tall, 3,000-5,000 ft., frequent.

Torit : Tallanga Forest, 442 ; 1950 ; Jackson, 1197, 1950 ; Lotti Forest 470, 1950.

***Adiantum incisum* Forsk.**

Erect terrestrial fern on road and stream banks in depression forest, in part shade, to 30 cms. tall, 3,000-5,000 ft., local.

Torit : Tallanga Forest, 434, 1950.

(This may be the same as *A. caudatum* L. collected at Rejaf by H. L. Sharitz, 943, 1920.)

***Pellaea quadripinnata* (Forsk.) Prantl**

Erect terrestrial fern in open grassy ground in montane forest, to 45 cms. tall, at 6,000 ft., only one seen.

Torit : Gilo, 196, 1947.

***Pellaea viridis* (Forsk.) Prantl (= *P. hastata* Link.)**

Erect terrestrial fern of dry banks, rocks etc., under shade, to 45 cms. tall, 3,000-7,000 ft. frequent.

Torit : Katire, 231, 1947 ; Gilo, Tallanga Forest, 1950.

Yei : R. Kajiko, gallery forest, 1950.

***Vittaria Volkensii* Hieron.**

Pendulous epiphyte with narrow strap-shaped leaves in montane forest, to 1 m. long, 5,000-8,000 ft., frequent in Podocarpus forest.

Torit : Gilo—Dumuso, 49, 1947.

(This is probably identical with Thomas 1700, 1938, from Itibol, recorded as *V. elongata* which is, however, confined to tropical Asia and Australasia.)

***Asplenium aethiopicum* (Burn.) Becherer**

Epiphyte on tree trunks in montane forest in deep shade, to 45 cms. tall, 6,000-7,000 ft. occasional.

Torit : Gilo, 390, 390A, 1950 ; K.M. Ali 20, 1950.

***Asplenium Elliottii* C. H. Wright (= *A. ruwenzoriense* Bak.)**

Erect terrestrial fern of damp ground in montane forests to 75 cms. tall, 5,000-7,000 ft., frequent.

Torit : Gilo, 267, 274, 1947 ; Williams 16, 25, 1948.

Asplenium erectum Bory

Erect terrestrial fern in montane and depression forests, to 60 cms. tall, 3,000-8,000 ft., common.

Torit : Gilo, 42, 1947 ; Dumuso, Williams, 24 1948 ; Tallanga and Lott Forests, 1950.

(This may be identical with Thomas 1574 (Tallanga forest), 1665, 1699 (Itibol) 1938 ; recorded as *A. lunulatum Sw.*)

Asplenium filare (Forsk.) Alston

Epiphyte on tree trunks in montane and depression forests, to 45 cms. tall, 3,000-9,000 ft., frequent.

Torit : Gilo, 263, 1947 ; Lotti Forest, 469, 1950 ; Mt. Kineti, Jackson 980, 1950.

Asplenium hypomelas Kuhn (=Loxoscaphe nigrescens (Hook.) Moore).

Creeping terrestrial fern beside streams in montane forests to 40 cms. tall, at 7,500 ft., local and uncommon.

Torit : Gilo—Dumuso path, 386, 447, 1950.

Asplenium Mannii Hook.

Small epiphyte on tree trunks among moss in montane forest, to 10 cms. tall, at 6,500 ft., only one found.

Torit : Itibol, 50, 1947.

Asplenium Megalura Hieron

Erect epiphyte on tree trunks in montane forest to 30 cms. tall, 5,000-7,000 ft., occasional.

Torit : Gilo, 390A, 1950.

Asplenium Schweinfurthii Bak.

Erect terrestrial fern on rocks in R. Kineti, to 30 cms. tall, at 3,000 ft. only one found.

Torit : Katire, 224, 1947.

Asplenium Thunbergii Kze.

Epiphyte in montane forest, to 45 cms. tall, 6,000-8,000 ft, occasional.

Torit : Gilo-Dumuso path, 396, 1950.

Asplenium usanbarens Hieron.

Terrestrial fern, in deep shade in montane forest, to 45 cms. tall, 5,000-7,000 ft., occasional.

Torit : Gilo, 403, 412, 1950.

Diplazium proliferum (Lam.) Thouars

Erect terrestrial fern in swampy ground in depression forest, to 2 m. tall, 3,000 ft., local.

Torit : Lotti Forest, Jackson 1025, 1950 ; MacLeay 450,459, 1950.

Dryopteris africana (Desv.) C. Chr.

Erect terrestrial fern in swampy ground in dense undergrowth of montane forests, to 1 m. tall, 5,500 ft., occasional.

Torit : Gilo, 415, 422B, 1950.

Dryopteris Bergiana (Schlecht.) O. Ktze

Erect terrestrial fern in swampy ground in montane forest, to 1 m. tall, 5,500 ft occasional.

Torit : 90, 1947 ; 413, 1950.

***Dryopteris cirrhosa* (Schom.) O. Ktze.**

Erect terrestrial fern of damp ground in gallery forest, to 90 cms. tall, 3,500 ft., common

Torit : R. Kajiko, 477, 1950.

***Dryopteris Deweyri* Christ**

Erect terrestrial fern in deep shade in depression forest, to 1.5 m. tall, 3,000 ft., locally common.

Torit : Lotti Forest, 461, 1950.

***Dryopteris inaequalis* (Schlecht.) O. Ktze.**

Erect terrestrial fern in swampy ground in deep shade in montane forest, to 1.5 m. tall at 5,500 ft., occasional.

Torit : Gilo, R. Ngairigi, 414, 454A, 1950.

***Dryopteris kiimensis* (Kuhn) O. Ktze.**

Erect terrestrial fern in swampy ground in montane forest, to 1 m. tall, 5,500-9,000 ft., frequent.

Torit : Gilo, 93, 1947 ; Kipia, 136, 1947.

***Dryopteris oligantha* (Desv) C. Chr.**

Erect terrestrial fern of dry forest floor of montane forest, to 70 cms. tall, 8,000-9,000 ft., uncommon.

Torit : Kipia, 262, 1947 ; Williams 10, 1948.

***Dryopteris pauciflora* (Hook.) C. Chr.**

Erect terrestrial fern on rocks beside stream in depression forest, to 45 cms. tall, at 3,000 ft., occasional.

Torit : Tallanga Forest, 436, 1950.

***Dryopteris silvatica* (Pappe & Raws.) C. Chr.**

Erect terrestrial fern in montane forest, to 1 m. tall, 6,000-8,000 ft., common

Torit : Gilo, 56, 1947 ; Williams 15, 1948.

***Dryopteris squamiseta* (Hook.) O. Ktze.**

Erect terrestrial fern on stream bank in alpine grassland, to 75 cms. tall, at 9,000 ft., occasional.

Torit : Kipia, 269, 1947 ; Williams, 12, 194 .

***Polystichum setiferum* (Forsk.) Woynar**

Erect terrestrial fern on stream banks in montane forest, to 75 cms. tall, 5,500-8,500 ft. common.

Torit : Gilo, R. Ngairigi, 97, 1947 ; Williams 13, 1948 ; Dumuso, 254, 1947.

***Elaphoglossum* sp.**

Creeping epiphyte on tree branches in montane forest, to 30 cms. tall, at 6,500 ft., locally common.

Torit : Gilo-Dumuso path, 422A, 1950.

(This plant was collected only in the unripe condition and is unidentifiable without sporangia.)

BOOK REVIEWS.

ALLAH LAUGHED. By C.E.G. Beveridge. Melbourne, The National Press. (No date or price).

This is a pleasant unassuming account by Dr. Beveridge of his service in the Sudan from 1925 to 1946. It is written for the Australian reader, to whom the Sudan is a very remote and far-off country (though it was, as it happened, the destination of the first Australian army to be sent overseas, to Suakin in the eighties).

At the same time it is, so far as I know, the first published account by a Sudan Civil Servant of his daily round of work and diversion. The picture he paints is a familiar one and passes the acid test of a colleague's eye. He is apt perhaps to dilute his history with legend and he makes a few careless slips, such as that the Tokar Light Railway runs to Aqiq, when he knew perfectly well that it goes to Trinkitat. But his style is easy and readable and it is nice to pick up a book about the Sudan which is free from journalistic clichés and journalistic gaffes.

His outlook is typical of his generation in the Service — impatient of the climate and the pests, a bit critical of his British colleagues, warmly affectionate towards the Sudanese, and proud of their progress in peace and their record in war. The description of the war years in Port Sudan and Khartoum from the point of view of the exiled official, relapsing after the defeat of Italy from combatant or at least front-line status to the monotony of the later stages, is also the first to see the light, and should make the book a welcome addition to the bookshelves of one's retiring years.

It is illustrated with some excellent photos by the author and some pleasant little anonymous decorations at the chapter-ends portraying familiar objects and scenes.

K. D. D. Henderson.

SUDAN BIBLIOGRAPHY

The thanks of the Editor are again due to officials of various Ministries and Departments and to the Librarian of Gordon College for the supply of information :—

A. HISTORY, LINGUISTICS, SOCIOLOGY.

ATIYAH, EDWARD : Progress in the Sudan. *Spectator*, March 1950. (Summarized in *Colon. Rev.*, 6, 6, June 1950, p. 171-2).

ARKELL, A. J. : An Introduction to African Pre-history. *African Affairs*, 49, 194, Jan. 1950, 56-67. Also *United Empire*, 41, 1, Jan.-Feb. 1950. Contains several references to archaeological work in the Sudan.

BATRAWI, A. : The Racial History of Egypt and Nubia. I. The craniology of Lower Nubia from predynastic times to the sixth century, *A. D. Roy. Anthropol. Inst.* 75, 1/2, 1945.

— : The Racial History of Egypt and Nubia. II. The racial relationships of the ancient and modern populations of Egypt and Nubia. *Roy. Anthropol. Inst.* 76, 2, 1946, 131-156.

BRANNEY, L. : Local Government in the Sudan. *Afr. Admin.* Vol. 1, No. 4, October, 1950.

BRITISH INFORMATION SERVICES : The Anglo-Egyptian Sudan. New York, March 1949, I. D. 730 (revised) 28 p.

CASSON, A. H. : The Southern Sudan. London, C. M. S., n.d. 17 p. (Adventures of Faith series) 9d.

CRAWFORD O. G. S. and ADDISON F. : Abu Geili and Saqadi and Dar el Mek. 2 Vols. London, 1950 £. 6-6-0.

CRAZZOLARA, J. P. : The Lwoo. Part I. Lwoo migrations. Verona, *Missione Africane*, 1950. p. 112, map. (Museum Combonianum, no. 3).

EVANS-PRITCHARD, E. E. : Nuer rules of exogamy and incest. (*In Social structure : studies presented to A. R. Radcliffe-Brown ; ed. by Meyer Fortes.* Oxford, Clarendon Press, 1949. p. 85-103).

— Nuer Totemism. *Annales Lateranensi*, 13, 1949, 225-48.

FASHODA RECALLED : the memorial to Commandant Marchand. *Illustrated London News* 215, July 9, 1949, 47.

FIELD, HENRY : The University of California expedition. II. Sudan and Kenya. *American Anthropologist*, 51, 1, Jan. - Mar. 1949, 72-84.

GRAY, Sir JOHN MILNER : Another letter of Emin Pasha. *Uganda Journal*, 14, 2, Sep, 1950, 219-20,

- GREENBERG, J. H. : Studies in African Linguistic classification V. The Eastern Sudanic family. S. W. J. Anthropol. (New Mexico) 6, 2. Summer 1950.
- GRIFFITHS, V. L. : Character Aims : some suggestions on standards for a rising nation. Longmans 1949 (Good Citizen Series) 1/4d.
- GROSS, B. A. : Pour la suppression d'une coutume barbare : L'excision. Notes Afr. IFAN, 45, Jan. 1950.
- GROTTANELLI, VINIGI L. and MASSARI, CLAUDIA : I Baria, i Cumana e i Beni Amr. (Missione di studio al Lago Tana. Vol. 6) Roma, Reale Accademia d'Italia, 1943. (Centro studi per l'Africa orientale italiana, 2).
- GROTTANELLI, VINIGI L. : I pre-Niloti : un'arcaica provincia culturale in Africa. Annali Lateranensi 12, 1948.
- HARVIE, C. H. : A sampling census of the Sudan. Population Studies, Sep. 1950.
- LANGLEY, Michael : No Woman's Country : travels in the Anglo-Egyptian Sudan. Jarrolds, 1950. 12/6.
A "cheap", journalistic account, unreliable.
- : Barbaric Custom. Spectator 182, Feb. 4 1949, 154 (Discussed Feb. 11, 18, and Mar. 11, 1949, 188, 224, 328).
- Refers to female circumcision.
- LEM, F. H. : Sudanese Sculpture. London, 1949, 21/6.
- LOCAL GOVERNMENT IN The Anglo-Egyptian Sudan. (In Local Government and the Colonies ; ed. by Rita Hinden : a report to the Fabian Colonial Bureau. London, Allen and Unwin, 1950. p. 194-211).
- LYTH, R. E. : Murle Grammar. Juba, Publications Bureau, 1947. 57 p.
- MALENGREAU, G : Vers un paysannat indigene : Les lotissements agricoles du Congo Belge. Brussels, Inst. Roy. Col. Belge, 1949. p. 92. 85 frs. belges.
- MARSHALL, A. H. : The adaptation of English local government principles to colonial territories. Afr. Admin. 2,4, Oct. 1950, 34-39.
- A discussion of some of the problems affecting the compilation of the Marshall Report.
- MASS EDUCATION BULLETIN : Mass education in the Anglo-Egyptian Sudan. Mass Educ. Bull., 1, 2, Mar. 1950, 27-30.
- MATTHEWS, P. D. and MATTAR AKRAWI : Education in the Arab countries of the Middle East. American Council for Education, Washington, D.C. 1949, 6 dollars.
Does not even mention the Sudan.
- MEKKI ABBAS : Local Government in the Sudan. Public Administration 28, Spring 1950, 55-58.

MYNORS, T. H. B. : A school of administration in the Anglo-Egyptian Sudan. *Afr. Admin.* 2,2, April 1950, 24-26.

NADEL, S. F. : Shamanism in the Nuba Mountains. *Roy. Anthrop. Inst.* 761, 1946.

NUER Grammar, Rudiments of : C. M. S. Press, Yambio, 1950 p. 30.

PLUMBE, W. J. : Sudan Libraries. *South African Libraries*, Vol. 18 No. 2 October, 1950.

ROWLING, G. : Some aspects of agricultural settlement in the Sudan. Lagos, Government Printer, 1949.

SHALABI, MOHD. M. : Rural reconstruction in Egypt. Pub. for the Egyptian Assoc. for Social Studies : Cairo, Soc. Art. Graphique, 1950.

SMITH, EDW. W. (ed.) : African Ideas of God. London, Edinburgh House Press, 1950. p. 308 21/-

Contains references to the Nuba.

SUDAN : The Sudan Directory 1950.

SUDAN : Gordon Memorial College Calendar 1950. Khartoum 1950.

SUDAN GOVERNMENT : Sudan Government Budget, 1st January 1950 to 30th June 1951.

— : Report of the Ad Hoc Agricultural Publications Committee.

— : Report on the Antiquities Service and Museums, 1948 by P. L. Shinnie, 1949.

— : Report of H. E. The Governor General on Administration of the Sudan 1939 — 1941.

— : Report of H. E. The Governor Genral on Administration of the Sudan 1942-1944.

— : Report of H. E. The Governor General on Administration of the Sudan 1947.

— : Report of H. E. The Governor General on Administration of the Sudan 1948.

— : Sudan Medical Service Annual Report 1947.

— : Education Department Annual Report 1947.

— : Report of Government Analyst 1948.

SUDAN. LEGISLATIVE ASSEMBLY : Report of a select committee on the future ownership of land in the north west extension of the Gezira Scheme ; with appendices and a memorandum on the distribution of *hawashas* in the Gezira Scheme.

— : Select committee of the Legislative Assembly on the future administration of the Gezira Scheme.

SUDAN. PUBLIC RELATIONS BRANCH. The Executive Council and Legislative Assembly. How it Works? How it can develop? Is it democratic? (In English and Arabic). Khartoum, 1950.

— : The Zande Scheme (in English).

— : Why Desert? (In Arabic).

— : The Gezira Bill (In Eng. and Arabic).

— : How Law is made (In Eng. and Arabic).

— : Trades Union in a Democracy (In English and Arabic).

SUDAN FOOTBALL ASSOCIATION : Handbook for 1950/51 Season (In Arabic).

THOMAS, H. B. : A relic of S. S. Khedive. *Uganda J.*, 14, 1, Mar. 1950, 103-4.

The ship is described as the life-line of Emin's Equatorial province.

Letter on this article from the Rev. Arthur B. Fisher appears in *Uganda, J.* 14, 2, Sep. 1950, 227.

VERRI, SISTO : Saggio di comparazione lessicale fra il Cunama e le lingue Bari e Lotuxo. *Anthropos* 45, 4-6, July-Dec., 1950, 618-26.

B. AGRICULTURE, MEDICINE, ENGINEERING, ETC.

ANDREWS F. W. : The flowering plants of the Anglo-Egyptian Sudan. Vol. 1 (Accompanied by "Vernacular Names of plants described in Vol. 1.") Buncle & Co. Arbroath, 1950. 21s.

— : Weeds of the Gezira Scheme. *Bull. of Agric. Publications Committee, Sudan Min. of Agric.* 1950.

— : Seid Grass Control. (Leaflet) *Sudan Min. of Agric.* 1950.

— : Buda Control. (Leaflet) *Sudan Min. of Agric.* 1950.

ANSON R. R., KNIGHT R. L., EVELYN S. H. and ROSE M. F. : Anglo-Egyptian Sudan. Progress Report of the Plant Breeding Stations, Season 1947-48, *Progr. Rep. Exp. Stas. Emp. Cott. Gr. Corp.* 1949 pp. 47-74.

ANSON R. R., KNIGHT R. L., ROSE M. F., BARLOW K. C. AND SADD J. E. W. : Anglo-Egyptian Sudan : Progress Report of the Plant Breeding Stations, Season 1948-49. *Progr. Rep. Exp. Stas. Emp. Cott. Gr. Corp.* pp. 52-79.

ANSON R. R., KNIGHT R. L., ROSE M. F., BARLOW, K. C., and SADD J. E. W. - Anglo-Egyptian Sudan : Progress Report of the Plant Breeding Stations, Season 1949-50, *Progr. Rep. Exp. Stas. Emp. Cott. Gr. Corp.*

- BARKER C., DUNN, H. C., and HILDITCH T. P.** : African Drying Oils, V. Some Nigerian and Sudanese drying oils. Soc. Chem. Industry, Vol. 69, No. 3, March 1950.
- BRITISH COTTON GROWING ASSOCIATION** : The Sudan Plantations Syndicate Ltd. and the Kassala Cotton Co. Ltd., and their work in the Anglo-Egyptian Sudan, 1950.
- BUXTON, P. A.** : Notes on trypanosomiasis and tsetse in the southern parts of the Anglo-Egyptian Sudan (Multigraph). Bureau Perm. Interafr. Tsetse Tryp., 1950 No. 85.
- CORKILL, N. L.** : Activation of latent Kala-azar in relation to protein metabolism. Ann. Trop. Med. Paras. (43) 261, 1949.
- : A scorbutic diet in a Nile cataract community. Ibid. (43), 293, 1949.
- : Vitamin P and antibody production. Lancet, 10th December, 1110, 1949.
- COTTON - SEED OIL MILL IN THE SUDAN** : Crown Colonist, Vol. 20, No. 225, August, 1950.
- COWLAND, J. W. and HANNA, A. D.** : The Cotton Jassid, *Empoasca Lybica* (De Berg) during the dead seasons in the Gezira. Anglo-Egyptian Sudan. Bulletin of Ent. Research, Vol. 41, Part 2, Sept, 1950.
- CULWICK G. M.** : A Dietary Survey among the Azande of the South-Western Sudan. Khartoum : Sudan Government 1950. P.T. 30.
- DARLING H. S.** : Cotton Growing at Zeidab, Northern Sudan, and the Control of *Laphygma exigus*. Reprinted from Emp. Cott. Gr. Rev. 26, pp. 271 - 7, 1949.
- DUNN R. P.** Cotton in the Anglo-Egyptian Sudan 1949.
- EGYPT, Ministry of Agriculture** : Seasonal variation in composition of water of the White and Blue Niles, the River Atbara, the main Nile at Wadi Halfa, D. S. Aswan Reservoir and at Embaba Bridge, the two Nile branches and some large canals of the Delta, by R. Aladjam and 5 others. Cairo 1949.
- FREEMAN, P.** : A species of Chironomid (Diptera) from the Sudan suspected of causing asthma. Proc. of the Royal Ent. Soc. of London, Vol. 19, Parts 3-4, 154. 1950.
- GEZIRA SCHEME** : Great work of Sudan Plantations Syndicate. E. Africa and Rhodesia, 26, 1343. June, 1950.
- : The Gezira Scheme. London, Central Office of Information, 1950. 16 p.
- : The Sudan Gezira in retrospect. World Crops, Vol. 2, No. 7, July 1950.
- : The nationalized Gezira Scheme. "The Times," July 3, 1950. (Summarised in Colonial Review, 6, 7 Sept. 1950, 210-211.)
- GRINDLEY, D. N.** : The component fatty acids of various Sudan vegetable oils. Journal of the Science of Wood and Agriculture, Vol. 1, No. 5 May 1950,

- HANNA, A. D. : The effect of rainfall on the cotton jassid, *Empoasca Lybica* (De Berg) in the Gezira, Anglo-Egyptian Sudan. *Bull. Ent. Research*, Col. 41, Part 2, Sept., 1950.
- HOWES, F. N. : Gum Arabic and other Acacia Gums : The Sudan. (In *Vegetable gums and resins*, by F. N. Howes.) 1949.
- HURST, H. E. and BLACK, R. P. : The Nile Basin : measured discharges of the Nile and its tributaries in the period 1938 — 42, 1949.
- HUTCHINSON, J. B. and KNIGHT R. L. : Response of Cotton to Leaf-Curl Disease (with an appendix on the distribution of cotton virus and *Bemisia* in Africa by E. O. PEARSON). *J. Genet.*, 50, 1950. pp. 100-111.
- HUTCHINSON, J. B. : The dissemination of cotton in Africa. *Emp. Cott. Gr. Rev.* Vol. 26, No. 4, October, 1949.
- IMPROVED HIDE PRODUCTION in the Sudan. *Crown Colonist*, Vol. 20, No. 224, July, 1950.
- JACKSON, J. K. : The Dongotana Hills, Sudan. 1950. *Emp. Forestry Rev.* Vol. 29, No. 2, 1950.
- JEWITT, T. N. and MIDDLETON, K. R. Dyeing of Cotton seed. *Emp. Cotton Gr. Rev.* Vol. 27, No. 4 Oct. 1950.
- JEWITT, T. N. : Soil Fertility Studies in the Zande District of the Anglo-Egyptian Sudan. *Commonwealth Bur. of Soil Sci. Tec. Communication No. 46*, 1949.
- : Goz Soils of the Anglo-Egyptian Sudan and Shifting Cultivation on the Clay Plains of the Central Sudan. *Trans. of the Inter. Cong. of Soil Sci. Amsterdam 1950 Vol. I.*
- KIRK, R. and LEWIS, D. J. : Taxonomy of Ethiopian sandflies (*Phlebotomus*). IV—*P. bedfordli* Newstead and *P. antennatus* Newstead. *Ann. Trop. Med. and Parasitology*, 43, pp. 333-336 1949.
- KIRK, R. and LEWIS, D. J. : Three new sandflies (*Phlebotomus*) from East Africa. *Proc. of the Royal Ent. Soc. of London*, Vol. 19, Parts 1-2, 15.2.50.
- KNIGHT R. L. and BOYNS B. M. : *Agricultural Science in the Sudan : : A Bibliography with Abstracts.* Buncle and Co. Arbroath, 1950. 20/- 256 pp.
- KNIGHT R. L. : The Distribution of Wild Species of *Gossypium* in the Sudan. *Emp. Cott. Gr. Rev.* 26 1949 pp. 278-85.
- KNIGHT R. L. and HUTCHINSON J. B. : The Evolution of Blackarm Resistance in Cotton. *J. Genet.* 50, 1950, pp. 36-58.
- KNIGHT R. L. : The Genetics of Blackarm Resistance VIII. *Gossypium barbadense*. *J. Genet.* 50 1950 pp. 67-76.
- KORDOFAN : A Sudanese area for development. (Mainly photographs) *Crown Colonist*, Vol. 20, No. 219, Feb. 1950.

- LEE, B. W. : Iceberg in the Sudan. *Weather*, 5, 3, Mar. 1950, 108.
- LEWIS, D. J. : A peritrophic membrane in *Simulium*. *Nature*, Vol. 165, No. 4207, June 17, 1950.
- PARNELL F. R. KING N. E. and RUSTIN D. F. : Jassid Resistance and Hairiness of the Cotton Plant. *Bull. Ent. Res.* 39 1949, pp. 539-575.
- ROBERTSON A. C. : The Hafir. *Bulletin of Agr. Pub. Committee, Sudan Min. of Agric.* P.T. 5. 1950.
- ROSE, M. F. : Possible crops for the cotton rotation in the Southern Jebels area of Kordofan, Anglo-Egyptian Sudan. *Emp. Cott. Growing Rev.* Vol. 27, No. 4, October, 1950.
- ROSSIN, M. : Rapport de mission au Soudan Anglo-Egyptian. *Annales de la Direction Generale du Genie Rural et de l'Hydraulique Agricole (France)*, Fascicule 69, 1948.
- SMITH J. : Distribution of tree species in the Sudan in relation to rainfall and soil texture. *McCorquodale*, London, 1950. 68 pp.
- TRAITEMENT MASSAL de la trypanosomiase bovine au Sudan. par l'Antrycide. *Bulletin Agricole du Congo Belge*, Vol. 41, No. 2 June 1950.
- VAN EMDEN, F. : Entomological expedition to Abyssinia, 1926-27. *Diptera Cyclorhapha : Muscides*, II. *Ann. Mag. Nat. Hist., Ser. 11.*, 14, pp.460-484, 1947.
- : *Diptera : Musciae.* — Expedition to South West Arabia 1947-8, Vol. 1 *British Museum (Natural History)*, 1949.
- WRIGHT, J. : Some characteristics of the White Nile and Sobat flood plains. *Nature*, Vol. 164, No. 4178, 26. 11. 1949.
- : White Nile flood plain and proposed schemes. *Geog. J.* 114, 4-6. 1949.

CORRESPONDENCE

The Editor, *Sudan Notes and Records*,
Sir,

Dr. Corkill's note on the Sudan Thanatophidia (*S.N.R.* XXX p. 101, 1949) was of interest, and the following extra cases collected during the last three years in Malakal hospital and Upper Nile may add to the interest of this subject.

Snake bite cases have been as follows :—

<i>B. arietans</i> .. .. .	..	..	..	13 cases and one death
<i>A. microlepidota</i> .. .. .	..	..	..	10 cases
<i>N. haja</i> .. .. .	..	..	..	3 cases
<i>C. rhombeatus</i> .. .. .	..	..	..	1 case
Unknown .. .. .	..	..	..	26 cases.

Total of 51 cases with one death.

The site of bite in the death from the puff adder was the calf of the leg, and death occurred within 24 hours of the bite. The vast majority of the bites of all snakes were on the leg or foot.

The three Egyptian cobra bites were seen in dispensaries and there is little doubt as to the snake. In one case fang marks were in the fleshy part of the calf of the leg, and could be seen on either side of the leg, indicating that the mouth of the snake must have been open at least six to nine inches. The bites were severe, and the local damage great, but recovery followed in all cases.

The commonest snake bite about which one *hears* from local Shilluk around Malakal is that of the black burrowing viper *A. microlepidota*. This undoubtedly occurs in the cracks in the soil and in and around dwelling places. The bite would appear to be rarely, if ever, fatal here, though its reputation in other parts is bad. The poison glands of this snake go back very far along the side of body of the snake. In one snake which measured just under a foot the poison glands went back nearly four inches. By comparison the poison glands of *N. Haja* would seem to contain less venom than this viperine species. It is possible that the species of *Atractaspis* seen here is a variant, or that its venom is not so dangerous as in other species of the same snake.

In deciding the actual snake responsible for the bite it is often very difficult to get accurate information. Even when the snake is in front of several people there will be many names given for it, some of which are

hotly disputed by the would be local naturalists. It must be obvious that not all people know the names of the snake accurately, any more than everyone in England can identify a grass snake or a viper.

The Egyptian cobra is the one most commonly brought in as evidence of narrow escapes, and this is said by all to spit (cf. Corkill) In one instance the spit was actually seen by two very reliable British officials.

The commonest snake seen in gardens during the rains is the *C. rhombeatus*. Although I have examined many I have never yet seen its relative, *C. resimus*, which is also recorded from Upper Nile.

Other non-poisonous snakes are also seen fairly commonly, and in gardens the *Psammophis sp.* is always regarded with dread on account of its pugnacious attitude. I have also seen many snakes, including the Egyptian cobra, swimming across the Nile.

Yours

J. F. E. Bloss,

Malakal, July 26th 1950.

The Editor, *Sudan Notes and Records*,
Sir,

I have been waiting for three years for some new champion to enter the lists against A.J. Arkell on this matter of Fung origins. Perhaps the younger generation is discouraged by the ill-success of its predecessors, whose efforts the pundits are apt blandly to ignore. Argue we never so convincingly that the Hill-Nubians came from the north, rather than the riverain Nubians from the south, L.P. Kirwan in Vol. XV does not even condescend to mention the existence of such a theory. So Arkell, worsted after bitter campaigning on the Shilluk front, quietly changes his ground to emerge in Vol. XXVII from an entirely new direction, assuming as always that whatever the Fung were they cannot have been what they claim to be, the result of Arab infusion into a local royal house on the upper Blue Nile

I tried to argue in a letter published in Vol. XVIII that the simplest explanation was the best. All I wish to do now is to query the new theory that the Fung came from Bornu.

To begin with I should say that I think the thesis on medieval Darfur, which, I understand, you hope to publish, puts up a convincing case for the Bornu theory here. Darfur is western and has basically more in common with Wadai and Nigeria than with the riverain Sudan. But does this in any way substantiate a similar claim for the Fung? Culturally the Black Sultanate looked north and east, not west. The religious leaders who headed the revival of learning were none of them westerners. Surely a western prince would have brought western civilisation?

Why moreover should he have concealed his origin so successfully that no faint whisper of it survived in Fung tradition or chronicle? Is not the absence of any such recollection more significant than grandiose-Bornu tales of suzerainty over countries of which they knew so little as to confuse Abyssinia with northern Kordofan? Why, if their first Sudan home was at El Aiss on the White Nile, did they have so strong a traditional link with the upper valley of the Blue, (whence, incidentally, Jebel Moya would be an obvious rendez-vous)?

Is not the Arab alliance more easily explained by Umara's Arab ancestry than by the defeat of the Abdullab at Arbagi? Was Umara so uncommon a name then? It is common enough now. Need we search remote tongues for a meaning for the name Fung? Has every tribal name a meaning?

I will not attempt to examine the Tuareg theory, beyond asking why all the kindred Tibbu tribes between the Nile and the Tuareg are ignored. If the word *Hamaj* stems from a Tuareg word for serf or the word *Kujur* from a Tuareg word for stool, what does this prove save that the pre-Arab inhabitants of northern Kordofan were, as one had always supposed, of Libyan origin, akin to the Tibbu and the Tuareg, which is what the Nubians surely are? How does this affect the Fung?

As for the pottery described, it is fully consonant with the Shilluk tradition that they found a Fung garrison at Demoth when they came up from the south in the sixteenth century, and with my thesis of 1934 that the Meroitic legacy was inherited by Soba and passed on by Soba to her conquerors.

Yours etc.

K. D. D. HENDERSON.

El Fasher, August 22nd 1950.

Editor, *Sudan Notes and Records*,

Re "Caves in the Sandstone Hills north of Omdurman" by R.A. Hodgkin (*Sudan Notes and Records* Vol. XXX 1949 Part 2).

Dear Sir,

All right, granted that the bats erode the roof. But how does the detritus get out of the cave? Not water, you say. Not wind, you say. Then what? My theory is toads. Under the El Obeid resthouse there is, (or was) a large colony of toads, and every afternoon sanitary fatigue-parties can be seen pushing the toad excreta — accompanied inevitably by some soil and sand — out of the main entrance (the main toad entrance, that is). This establishes, I think, the zeal of toads for sanitation. Very well then, assume the well-evidenced pluvial period, when toads at Jebel

Wileidat would be less odd than now, and suppose these passionately cleanly animals faced not only with their own excreta but that of the bats — then surely they would keep pace with the depositing by the bats of excreta plus detritus from the roof. This postulation of toad erosion may seem rather farfetched, but in default of any more likely hypothesis I think it should be allowed to stand.

Yours,
Cuthbert Scott.

Education Department,
British Administration,
Tripolitania.

30th July, 1950.

P.S. Please examine Jebel Abu Wilcidat for fossilised toad-bones, and El Obeid resthouse for a large cave under the foundations.

السودان لى نوتس و ريكوردس

Sudan Notes and Records

الندجة فيها INCORPORATING

وقائع الجمعية الفلسفية بالسودان

Proceedings of the Philosophical Society of the Sudan.

LIST OF CONTENTS

	Page
EDITORIAL NOTES	178
ARTICLES :	
The Diary of Abbas Bey	179
The Birth of a Dhow : G. R. MILWARD	197
The Mediaeval History of Darfur II : A. J. ARKELL	207
Notes on the Ngork Dinka : P. P. HOWELL	239
The proposed Sampling Census in the Sudan : C. H. HARVIE	294
A Note on Zeolite Artefacts : G. ANDREW	308
The Spelling of Place Names in the Sudan : J. W. WRIGHT and G. JANSON SMITH	311
NOTES :	
Decorated Pipes of the Fung : H. G. BALFOUR PAUL	325
Ancient Villages in Khor Nubt : G. E. R. SANDARS and T. R. H. OWEN	326
Medical Investigations of the U. S. Navy in the Sudan : H. HOOGSTRAAL	333
A Scorpion in Captivity : MANSOUR A. HASSEEB	338
Mount Lotuke, Didinga Hills : J. K. JACKSON	339
BOOK REVIEWS	342
CORRESPONDENCE	349

NOTES TO CONTRIBUTORS.

Contributions and correspondence are welcomed and should be addressed to the Editor. Contributors receive thirty free copies of articles published : further copies can be supplied at cost price on request. MSS. and photographs etc. are not returned unless specially asked for, and no liability is accepted.

Where possible, proofs are submitted to authors for correction : authors are requested to make only essential corrections in the proofs. The Editor reserves the right to make any corrections or alterations he may deem necessary.

To assist in the preparation of material for the printer, contributors are asked to observe the following rules :—

1. Articles should be submitted, if possible, in typescript (though this is not absolutely essential), typed with double spacing, on one side of the paper only.

2. Arabic or other foreign words, including Latin scientific names of species etc., should be underlined (not in inverted commas) and where necessary followed by the English translation in brackets. The Arabic form for the word may also be given. Titles (but not authors) of books or periodicals mentioned should also be underlined (not in inverted commas). If there are several references it is better to list them at the end and refer to them in the text by numbers or by author and date only.

3. Articles should where possible be divided by suitable headings and subheadings. Paragraphs should not be numbered. Contributors are invited to add a Summary to their articles.

4. For the translation of Arabic words the orthography of the Journal, and for places names that of the Survey Dept. (R.G.S. II), should be followed ; for the other African languages that of the International African Institute may be followed.

5. Maps and diagrams should be drawn as neatly and simply as possible in black ink on white paper. Where possible a portion of an existing map should be used and the Survey Department should be consulted at an early stage. While unable to undertake the drawing of special maps they may be able to modify an existing one to suit the purposes of the contributor.

السودان في رسائل ومدونات
SUDAN NOTES AND RECORDS

FOUNDED 1918

Patron

Sir Robert George Howe, G.B.E., K.C.M.G.

Committee

Chairman Sir James Robertson, K.B.E., 3N,

Editor T. H. B. Mynors.

R. L. Knight.

M. Jolliffe

P. L. Shinnie

Mekki el Manna

H. S. Darling

Sudan Notes and Records exists to promote the collection, exchange and publication of information about the Sudan in every aspect of its history, its people and its institutions, including not only the social but also the natural sciences. Any views expressed in any contribution published are those of the contributor alone and the Committee restricts itself to approving any material for publication as a contribution to knowledge in the Sudan.

Reproduction of any material appearing in this journal is freely permitted provided suitable acknowledgement of the source is made.

Sudan Notes and Records is published in or about June and December each year. The Annual Subscription, payable in advance, is 750m/ms. (in Egypt and the Sudan) or 18/- d., and can best be arranged by Bankers Order. Back numbers, with certain exceptions, and offprints of certain articles can be obtained from, and **Subscriptions and notification of changes of address should be sent to Honorary Treasurer or the agents Messrs. Luzac and Co., 46, Great Russell Street, London, W.C.1.** Copies may also be obtained from Sudan Bookshop, Khartoum and Wad Medani.

Editor,
P. O. Box 555,
Khartoum.

Hon. Treasurer,
P. O. Box 555,
Khartoum.

EDITORIAL NOTES.

We are glad to draw our readers attention to the publication *African Abstracts*, a quarterly review devoted to ethnological, social and linguistic studies, which first appeared in 1950. It provides a survey and abstracts in English or French of all significant articles in this field. The cost is only 26/- a year and it is obtainable from the International African Institute, Waterloo Place, London.

x x x x

Readers may be interested to know that the distribution of this journal for 1950 (Volume 31) was about 650 copies and sales of the current and back numbers showed a considerable increase over recent years. Unfortunately printing costs on a publication of this type are so heavy that we are still partly dependent on the generosity of the Sudan Government. To encourage our slowly growing circle of readers in Egypt and the Sudan we have introduced Summaries in Arabic of the more important articles, since publication entirely in Arabic would present difficulties to our many non Arabic speaking subscribers. We hope to present some more articles by Sudanese.

x x x x

NOTES ON PRINCIPAL CONTRIBUTORS

- G. R. Milward : was resident at Port Sudan for many years as electrical Engineer for the Sudan Railways.
- P. P. Howell : Sudan Political Service, author of numerous articles on anthropological subjects.
- C. H. Harvie : Government Statistician in the Sudan Government.
- G. Andrew : Government Geologist in the Sudan Government.
- J. W. Wright : recently Inspector of Topographical Section, Sudan Government Survey Department.
- G. JansonSmith : Assistant Director (South) in the Sudan Ministry of Education.

THE DIARY OF 'ABBAS BEY

Secretary of The Governor General of the Sudan,
killed in the disaster which befell Hicks Pasha's army in Kordofan in the
year 1883.

The following narrative has been translated from a diary which was found on the dead body of 'Abbas Bey by a Dervish after the massacre of the Hicks expedition in 1883. 'Abbas Bey was secretary to 'Ala al Din Pasha, Governor General of the Sudan, and accompanied His Excellency on that ill-fated expedition. The Dervish owner of the Diary was killed in the battle of Omdurman in 1898, and the small book containing 'Abbas Bey's notes in pencil then fell into the hands of the Intelligence Department of the Egyptian Army.

The following summary of the Diary will give some idea of the difficulties with which Hicks Pasha had to contend on his illstarred expedition, and of the events which led up to the final disaster in which he lost his life.

Before commencing this Diary it will be as well to recapitulate the composition of the force. At Khartoum on 8th September 1883 Hicks Pasha paraded his force which was composed as follows :—

<i>Infantry</i>	7,000	<i>Colonel Farquhar, Chief of Staff.</i>
<i>Cavalry</i>	500	<i>Majors Seckendorf, Warner, Massy and Evans.</i>
<i>Bashi Bazouks</i>	400	<i>Captains Herlth and Matygna.</i>
<i>Cuirassiers</i>	100	<i>Lieut. M. Brody (late Sergt. Major R. H. A.) Sergt. General George Bey.</i>
<i>Camp followers</i>	2,000	<i>Sergeant Major Rosenberg.</i>

On 9th September Hicks Pasha left Khartoum with this miscellaneous force for Dueim to join 'Ala al Din Pasha, Governor General of the Sudan, a Turkish cavalry officer, and appointed from Cairo second in command of the expedition.

These men, composed mainly of those who had served under 'Arabi Pasha and had been disbanded, were about as unpromising a lot as could well be imagined, but they had the one advantage of being strangers in the land so a compromise on their part with the Mahdists was not probable. Such was the force with which it was intended to relieve the beleaguered

garrison of El Obeid and by quelling the revolt at this time raging in Kordofan to re-establish once more the prestige of the Egyptian Government in the Sudan. The Diary of 'Abbas Bey commences on 11th September at Dueim which is 120 miles south of Khartoum on the White Nile, and was the base of this expedition.

DUEIM, probably 10th or 11th September, 1883¹

On this date 'Abbas Bey made his first entry in this Diary which is as follows :—

The Governor General, 'Ala al Din Pasha, despatched two of his officials, Hussain Pasha Mazhar and Shukri Bey, in S.S. "Fasher" to make a reconnaissance and choose a suitable spot on the river bank on which to encamp the army. They were instructed to await the arrival of the Governor General at the spot selected, as His Excellency intended to proceed to El Kawa in S.S. "Merowe" on her arrival and wished, on his return journey, to call at the post chosen by Hussain Pasha Mazhar.

We left Dueim for El Kawa at 11-30 a.m.

12th September.

Arrived at El Kawa at 12-30 (Arabic time). On our arrival fort fired a salute, His Excellency disembarked and inspected fortifications and was delighted to see that everything was in perfect order. His Excellency then inspected all the troops and afterwards accompanied 'Ali Bey, Commander of the post, to the keep of the fort in the centre of the town. The troops were marched past in perfect order and then dismissed.

His Excellency now called up the officers and having expressed his approval begged them to communicate the same to the troops.

His Excellency now proceeded to the house of 'Ali Bey where he met all the officers and partook of refreshment. After this he went to the house of 'Abd al 'Aziz Bey where he received all natives of the town, and after drinking coffee we returned to the steamer.

At 2 o'clock (Arabic time) His Excellency sent for two natives of El Kawa and inquired from them which was the best route to Kordofan for the army and animals to follow. These men recommended the route shown at the end of this book, and the Governor-General was persuaded of its suitability owing to the abundance of water, sufficient for the army all the way.

At 10 o'clock (Arabic time) we steamed back to Ed Dueim, arriving at 12.30 in the evening.

Thursday 13th September.

His Excellency disembarked in the morning and we disembarked in the evening. On the Governor General's arrival in camp guns fired a salute.

¹ Place names all as given by author. —Ed.

Tents were pitched for His Excellency outside the fortifications. In the evening we sent two English letters to His Excellency Hicks Pasha by steamer "El Fasher" one from the Governor General and one from Hussain Pasha Mazhar.

Friday, 14th September.

Hicks Pasha sent an answer to our telegrams. He announced his arrival with his force at El Tira El Khadra, and regretted to say he had lost 157 camels since leaving Khartoum. These camels had been ill before he started. The Pasha announced his satisfaction at the result of our enquiries as to the best route for the army to follow to Kordofan, and promised to be at Dueim by Thursday, September 18th.

From September 15th to 19th. No events chronicled.

Thursday, 20th September.

We heard news that the troops were coming in. On going out to meet them we met Colonel Farquhar, Chief of Staff, who had just ridden in. He informed us that the General would shortly march in with the troops. On the afternoon at 4 o'clock His Excellency the Governor General and myself went out to review the troops of the garrison who were drawn up to receive Hicks Pasha's force. Shortly after this Hicks Pasha arrived and was received with the greatest respect. His Excellency the Governor General invited him to his tent and questioned him as to his journey from Khartoum which had taken 12 days. That evening we all dined with the Governor General.

Friday, 21st September.

At 4-0 p.m. I went to Hicks Pasha's tent, which was about half an hour's walk from our camp, and explained to him the necessity of sending out the camels to graze. At once Rajab Bey was sent for and asked why the camels had not been sent out to graze. Rajab Bey began to make excuses, and said he thought Hussain Pasha had charge of the camp as he had seen him the previous day giving orders to the soldiers. Rajab Bey had been Camp Commandant from the time of departure from Khartoum, while Hussain Pasha had been at Dueim. Hicks Pasha then told Rajab Bey it would be better in future to act and not think. The latter course had resulted in the camels being kept without food for 23 hours. Rajab Bey apologised and went out. This incident shows the jealousy existing between Rajab Bey and Hussain Pasha.

I now returned to camp as I was suffering from fever.

Saturday, 22nd September. In bed with fever.

Sunday, 23rd September.

During the afternoon Hicks Pasha and the Governor General had a conference as to the most suitable route by which to proceed to Kordofan. It was agreed that the 4th Battalion with some mounted men and guns under Rajab Bey should proceed on the following day to search for water in the Shatt district. It was also decided to form six military posts garrisoned by 200 Irregulars and 200 Regulars with a Mountain Battery. The names of all places through which the army would pass, and where a sufficient quantity of water could be obtained, were pointed out to Hicks Pasha. The names of those places were Dueim, Shatt, Zureiga, Serakna, Narabi, Aigella, Johan, Abli, Bilab, Um Sheikh, Rahad, Kashgeil, Melbeis and El Obeid.

Monday, 24th September.

Rajab Bey proceeded with the above mentioned force towards Shatt.

Tuesday, 25th September.

Report from Rajab Bey that he had found in Shatt 50 wells, each well 10 to 12 metres deep and with about 11/2 metres depth of water in each. Also on the road he had crossed a large brook when he had gone about half way.

Wednesday, 26th September.

A report came in from Rajab Bey that he had cleaned out the wells for the army. Hicks Pasha determined to start with his force on the following day.

Thursday, 27th. September.

At 1 o'clock in the morning the "Victorious Army" started from Dueim and marched towards Shatt. At 6 o'clock the horses and camels were watered at a brook we crossed. At 7 o'clock we halted for 11/2 hours, then march was resumed and Shatt was reached at 12 midnight where we encamped for the night.

During our entrance to Shatt great disorder prevailed among the army and the different regiments did not follow in order, being at times three or four thousand metres from the square. This caused much anxiety amongst the officers who understood well that the situation was very critical, especially if their movements had been observed by the enemy.

Friday, 28th September.

Hussain Pasha seized this opportunity to show his discontent. He went to the Governor General and asked that either he or Hicks Pasha should be given full control of the army, as the disorder which was going

on was a source of great danger to the whole expedition and must be stopped. The Governor General told him he would speak with Hicks Pasha about the matter.

September 28th.

All through the night it had been impossible for any soldier to know where he was, or for any company to find its battalion, owing to the miserable state of the army and the confusion and noise of horses and mules. At about 2-0 p.m. Hicks Pasha and Hussain Pasha met in the tent of the Governor General. I had already told Hicks Pasha how angry Hussain Pasha had been at our entrance to Shatt. Hicks Pasha now informed me that from now he, and he alone, was to be Commandant of the force, and that Hussain Pasha being simply Second-in-Command it was most painful to him to see his Second-in-Command behaving in such a manner. If Hussain Pasha had any remarks to make they should be made to him privately, and he should not criticise openly before all his troops the conduct of his Commanding Officer.

The disorderly manner in which the army entered Shatt was entirely contrary to his orders, and there must have been some mistake in their transmission.

Hicks Pasha then added "Hussain Pasha had been attributing ignorance to me, an officer who has been serving in military positions for most of my life. For this insult either Hussain Pasha or myself will have to leave this expedition and return to Khartoum. In order to assure you that what I am saying is true, I will give you the full detail of my orders which should have been carried out. On approaching Shatt I saw the square was some way from the place pointed out by Rajab Bey. The approach to Shatt was obstructed by the huts of the natives, and by the trenches and zeriba. Therefore I thought it wiser to instruct the different battalions to enter in succession, then the square would have followed in an orderly manner with the camels in the centre. I never expected when I issued these orders that they would be disobeyed to such an extent that each battalion entered Shatt entirely by itself."

I answered I was sure Hussain Pasha did not mean to criticise his orders but desired henceforth that the officers should be given to understand beforehand how they were to proceed, so that they might not be at a loss what to do. No harm had happened this time but it might next time. "Now" said I, "as long as you have proved that the mistake was committed by the translators there is no need for difficulties to arise between you and Hussain Pasha at such a trying time, as we are all dependent on you. Also I do not wish the other officers to know of this incident as it would cause them to lose confidence in you both."

The two then began to deliberate about the question in the presence of the Governor General. I did my best to reconcile them and succeeded in doing so. It was agreed that from now no orders were to be issued except after consultation with the Governor General and principal officers. It was also decided to leave in Shatt 200 Irregulars and one company of black troops with a Mountain Battery. Hicks Pasha and the Governor General with the 2nd and 4th Battalions would proceed on the following day to Zureiga. The reasons for leaving the above guard was our uncertainty as to the existence of sufficient water for the immense army with us. Hussain Pasha with the 1st and 3rd Battalions was to remain and help the garrison to build a fortification sufficient to hold them. Our consultation now ended and we went to our tents.

Another incident which happened also made me feel very uneasy as to whether the harmony, which should have prevailed in our force, really existed. The Governor General had ordered that all camels should be sent out grazing to-day in charge of two corporals and three privates. These camels were sent out as ordered but one of the corporals did not return, the reason of his absence is as follows :—This corporal had escaped from the enemy and joined us at Dueim. The Governor General having taken pity on him, and also being desirous of showing the people of Kordofan that the Government did not treat harshly those who had been captured, gave him a post in the army. He was made a corporal, given two suits of clothes and attached to the staff of the Governor General as, knowing the Kordofan roads, it was thought the man might be of great assistance to us in our advance. On our arrival at Shatt we sent him out as mentioned with the grazing guard in charge of the camels. At 1-0 p.m. today it was reported he had seized the opportunity, stolen a fine camel, a rifle, 120 rounds of ammunition, and escaped towards Kordofan. Doubtless this man will tell the Mahdi all our news and prove his statements by producing the stolen articles. The other corporal on guard with him came in and reported that this man had ridden away in the direction of the well and, not having returned, the corporal thought he ought to inform his officer of the fact as it was getting late. Three hours having elapsed since the man had been last seen pursuit was hopeless, and we knew by the western route he could reach Kordofan in three days.

This incident taught us to be more cautious about receiving strangers in our forces, and it was a thousand pities that he should know, as doubtless he did, that there was not that order and regularity in our camp that should have existed.

September 29th.

At noon we left Shatt and proceeded towards Zureiga. After marching five hours we came to a place called Heglig where the army encamped for the night and formed a zeriba. The scouts were sent on ahead with orders to search for water but not to go more than 9 or 10 miles from camp. If water was found our force would wait in its present camp until the arrival of Hussain Pasha and his troops, and then we would all move on together. At dusk each man took up his position in the zeriba. Rain fell during the night.

September 30th.

Hussain Pasha with his force arrived early in the morning and encamped on a zeriba close to us. The scouts returned and reported an abundance of water.

October 1st.

At 1-0 a.m. we left camp, marched four hours and then halted to rest for a short time, eventually continuing our journey and reaching El Khanfaria about 9-0 a.m. Here we encamped by the brook and spent the night. During our advance I was riding with Colonel Farquhar, Chief of the Staff, and had a talk with him about Hussain Pasha. He told me the latter had not carried out the last orders given to him. I asked him the reason and he answered that the night he had sent orders to Hussain Pasha that the advance should be carried out as follows :— The front side of the zeriba should be opened and each regiment should pass through in succession followed by the guns and camels. The square would then be formed outside. This could have been done in half an hour, but Hussain Pasha wished to remove the whole of the front side of the zeriba and march the square out together. Considering this was a safer plan to pursue, Hussain Pasha had done this, and of course Hicks Pasha was furious at his disobedience.

October 2nd.

At 12-0 noon Captain Herlth with 100 mounted men and a guide went out to look for water on the road leading to Serakna. In three hours he returned and reported that there was only a small brook on the road, and this would not contain sufficient water for the army. His Excellency the Governor General, hearing Captain Herlth's report, came to the conclusion that the guide had led him wrong. The guide was questioned and affirmed that owing to pursuing two Arab scouts whom the patrol had sighted they had lost their way and so missed the water. Hicks Pasha was consulted on the subject and said, " I think that the enemy, knowing of our approach, have watered all the cattle they could so as to use up the water. The best

course to pursue at present is to send back to Shatt and leave a guard over the water there until a force can proceed to Serakna. If we do not do this the Arabs in our rear may destroy this water." It was eventually decided to send back a Battalion on the following day to Shatt with orders to entrench itself there. Before closing the incidents of the day I must give the details of what took place at a meeting of officers to discuss the situation and decide on future plans. The following were the officers who met together :-

The Governor General,
Hicks Pasha,
Hussain Pasha,
Colonel Farquhar,
Miralai Salim Bey, O. C. 1st Battalion,

Miralai Rajab Bey, O. C. 4th Battalion, and myself.

The chief subject under discussion was as to the advisability of leaving posts at places we passed through or not. Hicks Pasha said a good line of communication from Dueim was indispensable, and supplies and all the necessities of the army could then be forwarded without danger. Every officer was asked to give his opinion. Hussain Pasha said he would prefer to give his opinion after the Miralaiat. Miralai Rajab Bey said ~~that although~~ a good line of retreat was a necessity yet he did not think it advisable to weaken the army by detaching small posts for such work. Miralai Salim Bey held the same opinion.

Hussain Pasha then said that if they left their line of retreat unguarded they would be breaking every maxim of warfare.

Hicks Pasha agreed with Hussain Pasha and said he had called a meeting of officers to gain their consent on this subject. Hussain Pasha then proposed that a good scheme would be to send to Khartoum and obtain men from the two Battalions there and use them on the line of communication. Hicks Pasha answered to the effect that he thought this remark wide of the mark, as the question to be discussed was whether it was advisable with the force now at their disposal to arrange to drop posts as they advanced, or to keep the force concentrated.

October 3rd.

A good deal of wrangling then took place between Hussain Pasha and Hicks Pasha. Hicks Pasha finally appealed to the Governor General who said, "So far none of the Arabs have come in to surrender. The force at our disposal is not large enough to allow of its being divided, and if our forces were divided it means that the detachments might be defeated in detail. I think we should march to El Obeid together and then send back for our provisions etc., but as Hicks Pasha is the leader of this expedition

we must do as he thinks fit, and he may be sure we are all ready to carry out his orders."

Eventually Hicks Pasha asked us to send in our opinions in writing. The meeting then dispersed.

At 11-0 a.m. Colonel Farquhar with some scouts and guides went out to look for water on the Serakna road. The Battalion to return to Shatt to guard the water also started at this hour. Shortly after sunset Colonel Farquhar returned and announced that about a day's march ahead there was a brook of water and another brook about another day's march on. At Serakna itself there was a brook which would supply the army with water for two days. Hicks Pasha then sent off a N.C.O. and three men with a letter to the O.C. the force he had sent back to Shatt in which he directed him to return at once and rejoin the army. The letter was delivered but the N.C.O., though leaving his men with the force, foolishly endeavoured to rejoin the army by himself. He never returned and his loss cast a gloom over the men.

October 4th.

The force from Shatt marched in at dawn. The whole army then marched to Um Sadena (the first brook) and encamped in a zeriba. During the day one of our buglers hearing a shot fired sounded the alarm. All the men got into their places and the guns were unlimbered, everyone thinking the enemy were on us. On enquiry it was discovered that it was only our water picquet which had shot two scouts whom they had met near the brook. The dismiss was sounded and our feelings were relieved.

October 5th.

At 12-0 noon we marched to Rahad el Abid where we arrived at 6-30 p.m. Here we encamped for the night.

October 6th.

At 12-30 p.m. marched to Serakna arriving there at 5-0 p.m. Here we spent the night. During the evening Colonel Farquhar came to me and said he had been talking with the Governor General and had told him that he did not consider our camp at all desirable from a military point of view, for we were surrounded by thick woods on all sides. The Governor General had agreed with him so I went to inform Hicks Pasha and propose we should move early the following morning.

October 7th.

Left camp 7.40 a.m. and proceeded towards Khor es Sagh. Met an old woman en route who reported that the Arabs were collecting at Nurabi to oppose our advance.

October 8th.

Left camp at 10.0 a.m. and marched towards Nurabi which was reported to be only two hours off. After marching for an hour and a half we arrived at a thick forest which we could not march through in comfort so Hicks Pasha decided to march round it and commenced issuing orders to this effect. The square then moved on and arriving at Nurabi camped there. While in camp here, some guides were sent ahead to ascertain if there was any water. They were attacked by the Arabs, one was killed and another badly wounded. On arrival at the camp the Governor General sent for Hicks Pasha and myself to consult us about the situation. Hicks Pasha in the meantime had already issued orders for marching on the following day, so the Governor General, having decided to let things remain as they were, went to rest in his tent. Hicks Pasha now came round to see me on the question of an early start on the morrow, and I told him the Governor General was asleep in his tent. Hicks Pasha then said "The Governor General has only to consider my orders. Now here I am ready to confer with him and he is asleep, the result will be that our march will be delayed and all owing to His Excellency." I answered him and said, "You should not blame the Governor General who only heard of your intended march through Hussain Pasha ; it is your duty to inform the Governor General yourself when you intend to move. Furthermore, to avoid any more discussion, I will awaken the Governor General now and tell him of our conversation." I then went and awakened the Governor General who at first said he was quite satisfied with Hicks Pasha's orders, and until I urged him to come with me and see the General, he did not seem inclined to move owing to suffering from a little fever. Eventually I persuaded him and we went to visit Hicks Pasha, who received us very cordially and began to excuse himself by saying. "I hope Your Excellency will only consider orders that issue from me personally." I discovered later that the original march orders for the next day had been issued by Colonel Farquhar with the consent of Hicks Pasha. Hicks Pasha himself had informed Hussain Pasha. Hicks Pasha now denied ever authorising Colonel Farquhar to issue such an order. Colonel Farquhar, who was present, contradicted him, and the two began a heated argument on this subject. I begged them to cease arguing as up to date no harm by reason of this order had befallen the army. The two then kept silence. Guides were called in and questioned about the water on the road we were to proceed by on the following day. The first guide who was questioned asserted he knew of water at Aigella, which was about eight hours march ahead, but said that about four hours march on there existed a brook in which water would probably be found. Various other guides were questioned but they all bore out the

first guide's statement. Hicks Pasha then decided to camp at the intermediate brook and to start early on the following day.

October 9th.

Marched to brook about four hours ahead and camped there for the night finding good water.

October 10th.

Recommenced our march to Aigella which was supposed to be four hours ahead. Our men had only water for one day. The guides now lost the road and finally the men became very exhausted through want of water, their condition being so pitiful that I hardly like to describe it lest the authorities might hear of it and so abuse me for describing it. Having begun I think I had better continue and risk being blamed for doing so. We knew the guides had lost the way and we were rapidly becoming exhausted from heat and fatigue. The men's water bottles were empty and they began to fall out in dozens and, leaving the ranks, to wander about in search of water, the result being that our army was scattered over 2,000 metres. Seeing this disorder we all felt sure it would be impossible to get them on and attributed our plight to our guides intentionally leading us wrong. The Governor General and Hicks Pasha rode round the square urging the officers to keep their men in hand, and remonstrating with the men on their folly at leaving the square and so becoming an easy prey to their enemies. The Staff were all in a state of fury, the men now being little short of maniacs. Hicks Pasha called out that if 100 Arabs attacked them at this moment the result would be a general massacre and each man would kill his neighbour in his frenzy. Also for an army that cannot march for 12 hours without water, I attribute their extreme thirst to excessive eating of Sudan beans. It was a terrible hour for the General. Fortunately we came across some melons and these practically alleviated the men's thirst ; we continued in this state till 10-30 a.m., all the time being followed up by the enemy who killed all the weak men who dropped on the road. At last Captain Herlth sighted a flock of ducks which showed there must be water in the vicinity. Our cavalry went in that direction and finding a large brook, sent back word to the column which was immediately marched towards it. We pitched camp and orders were given to build a zeriba. Colonel Farquhar and myself went down to the water and were just placing a guard on it when the whole army rushed down to it to quench their thirst. Hicks Pasha now came down to see the water and told me to tell Hussain Pasha to go back at once to the camp and collect the army. Hussain Pasha answered, " There is their Commander, let him keep order if he can because I am not able to do so. " I reported this speech to Hicks Pasha who said

"Hussain Pasha quite forgets all this disorder is entirely due to his own mismanagement. I shall refuse to keep him as my Second in Command; he does nothing but disobey my orders, and thinks that I should be junior to him." Hicks Pasha then rode back to camp and endeavoured to collect men to build the zeriba, leaving Hussain Pasha at the brook.

October 11th.

Continued our march to Aigella, the cavalry under Captain Herlth covering our advance. After marching for two hours we received news that the cavalry had found a khor with abundance of water, this news encouraged the troops who marched into camp in good order. A zeriba was formed and the men all obtained as much water as they required. From midnight it rained for three hours and during this time an alarm was given that the Arabs were approaching the zeriba. Everyone commenced firing at the place where the Arabs had shown and continued for some minutes. The men then ceased firing and cheered. The Governor General thanked them for their gallantry, remarking that if this gallantry continued they would be certain of success no matter how strong the enemy might be. During this firing I was nearly shot by one of our own men. This had been the evening before Bairam, our great feast, and the Governor General had at first allowed the band to play but afterwards, thinking we might be attacked, he ordered it to stop. Hardly an hour had elapsed before we were attacked as I have described.

October 12th.

This was the feast of Bairam, and all our soldiers were congratulating themselves on the successful result of their first skirmishes with the enemy. The Governor General held a reception which all officers attended, guns fired a salute and everyone cheered the Khedive, and we all felt very sanguine as to our ultimate victory. After the reception I went to see Hicks Pasha who asked me about the cause of the rebellion in Kordofan. I answered that the causes were as follows: The former Governor General, General Rauf Pasha, having had his troops defeated by the Mahdi several times, at length asked the Government for reinforcements. The Government then removed him and appointed 'Abdal Khader Pasha to be Governor General. Pending the arrival of the new Governor, Geigler Pasha acted as Governor General. The Egyptian Government was informed by him that reinforcements were not necessary as he had quite enough men to quell the rebellion which was fast dying out. The Egyptian Government in consequence did not send any reinforcements and the rebellion spread through unchecked. We then had a talk about Kordofan trade and eventually returning to the subject of the rebellion, the General said that the death of the Mahdi would alone solve the difficulty, and he only hoped we would be able to achieve

this object. I agreed with his opinion. The Governor General informed me he had seen a woman whom the column had picked up and she had promised to take some proclamations to the various Sheikhs in the neighbouring districts. He asked me to get Hicks Pasha's signature to these documents. I did so and explained their contents to Hicks Pasha who said it was an excellent plan and he only wished we had met some of the Sheikhs before. Colonel Farquhar who was present then said, "Can't we communicate with Elias Pasha in El Obeid and say we are ready to offer him twenty to thirty thousand dollars and high promotion if he will join us, and on our entrance into El Obeid surrender the Mahdi into our hands. If we allow the Mahdi to escape all the Arabs will attribute his escape to being a miracle and his prestige will be increased." I answered that we all held these views but as we could not obtain a messenger to go to Dueim it was hardly likely we could find one to go to El Obeid, so it was not much use thinking of such a thing. I then returned to the Governor General with the proclamation and told him of my conversation with Hicks Pasha. The Governor General said that money rewards had already been given but with no result. During the day four of our men wandered from camp without their arms to a distance of about 2,000 metres. Two hundred Arabs suddenly attacked them and they were all killed. An order was now issued by Hicks Pasha forbidding any soldier to leave the zeriba unarmed.

October 14th.

At noon we marched towards Sohan intending to camp for the night half way. Before starting the 1st Battalion was sent out about 5,000 metres from camp to drive off some of the enemy who were supposed to be concealed there. A couple of shots were fired and a few of the enemy bolted but no harm was done to them. One prisoner who was brought into camp said the natives were all afraid of the Mahdi and so had sided with him. At 8.0 p.m. we reached a village called Feki Mohammed Terrbea where we camped for the night.

October 15th.

Left camp early and marched to Sohan, arrived there at 9.0 a.m. and encamped. Loss on road 4 soldiers and 101 camels resulting from thirst. This was a great surprise as on leaving Aigella the O.C. Battalions reported their men had plenty of water with them. Hicks Pasha and the Governor General were very angry and said the consumption of the water in this way was simply owing to the officers neglecting to supervise the water arrangements.

October 16th.

The Governor General spoke to Hicks Pasha about the grave necessity of looking after the camels. Hicks Pasha replied that he had warned all ranks but his orders seemed to be disregarded. Owing to transport being tired we remained to Sohan for the night.

October 17th.

Marched to Balashik where we camped for the night.

October 18th.

At midnight marched towards Abli. After marching for three hours we heard volleys and the Governor General ordered our two Krupps to fire a few shots. I am sorry to say they were found not to be in working order which was entirely due to neglect, and was the fault of 'Abbas Bey, O.C. Artillery. Our march was then resumed and we arrived at a place called Kaducim where we encamped.

October 19th.

We continued our march to Abli and on arrival there found no water so had to proceed to a place called Um Debaker where there were two brooks of muddy water, we encamped there for the night.

October 20th.

Early in the morning we left for Beliab, and after marching for two hours came across an impenetrable bush. Colonel Farquhar said by compass bearing the shortest way was through this bush, and ordered the guides to go that way. Surely the guides knew the best road and how could the Colonel tell by his compass the condition of the road through the bush, and that it would not greatly fatigue the troops to march by it ! Is this what they call the skill of the English to lead us blindly against advice of our guides into a dense bush ? Later in the day Colonel Farquhar once more induced us to go through the bush instead of following the road ; this resulted in troops and transport becoming hopelessly entangled, the Governor General being in one place and Hicks Pasha in another. The Governor General about dark ordered a bugler to sound the assembly and eventually the army was collected and encamped where it was for the night. All ranks from the Governor General downwards felt very much discouraged by this march, and the men began to say that the English General would never have led them through this jungle with high grass all round unless he wanted them to be all annihilated. I thank God the enemy had not fired the grass or the result would have been terrible.

October 21st.

Continued our march towards Beliab. En route I heard from 'Abbas Bey that Hicks Pasha on the previous night had ordered strict watch to be kept over the guides; the guides had gone to see the Governor General about it, and the Governor General was just going to see Hicks Pasha. I heard afterwards that Hicks Pasha denied ever having issued any orders about watching the guides. The Governor General said to Hicks Pasha, "I have obtained the guides, and am quite satisfied as to their loyalty and I do not wish you to interfere with my people." The guides were eventually sent for and pacified, although they declared they were no longer responsible as their advice was not followed and Colonel Farquhar was the only guide, but how could the General justify his conduct of the previous day if he did not imprison the guides so as to give the soldiers the impression that the guides were behaving treacherously. After marching one hour news was brought in that water was ahead and in another hour we reached Khôr Beliab and encamped there making the usual zeriba. As soon as we arrived the Arabs opened fire on us from the opposite bank of the khor and sniped us all day. We could not see them as they were about 800 metres off in long grass and approached to close range and then crawled away. Five of our men were wounded. Hicks Pasha ordered the guns to fire a few rounds in the direction of the firing, and then directed one battalion to cross the khor and build a zeriba on the further bank which they did and the enemy withdrew. During the night the Governor General and Hicks Pasha had a conference.

October 22nd.

The enemy sniped us most of the day, our guns fired at them at intervals. Our losses were—3 killed and 3 wounded. Our cavalry reconnoitred a few thousand yards to the front and picked up a dead Sheikh, evidently one of the enemy's leaders.

October 23rd.

Marched towards Rahad carrying water for two days. After marching for about two hours we came to a high hill from which we could see the enemy at about 2,000 metres away advancing towards us. Hicks Pasha collected the troops and transport on the hill and then opened fire with the guns, which made very good practice and dispersed the enemy who fled. We continued our march but very shortly fire was opened us from three sides. Our rear face of the square behaved most gallantly and continued repelling the enemy until we reached camp. Arrived at Audia about midday where

we formed a zeriba ; our soldiers were much encouraged by their success in to-day's fight and were now full of keenness to meet the enemy. Our losses to-day were one killed and three wounded.

October 24th.

Left Audia for Rahad. Before leaving we found a large number of notices which had been left by the enemy to frighten our men ; these notices were to the effect that the fate of all those who did not at once join the Mahdi would be to die by the hands of the Lord, Who would most assuredly kill them for refusing to adhere to the banner of His Prophet. Hicks Pasha had all these notices collected and burnt.

Arrived at Rahad in the afternoon and encamped there.

October 25th.

Colonel Farquhar came to see me early in the morning and we had a talk as to the advisability of leaving a post at Rahad. I informed him that up to the present no decision had been arrived at upon the subject. During the day our men had various small skirmishes with the enemy. Hicks Pasha was very annoyed with his Egyptian Staff Officer whom he accused of having pitched his tent on purpose in a place exposed to fire from the enemy, and a rampart was eventually built round the tent.

October 26th.

Shortly after dawn our outposts were attacked but the attack was repulsed. Hicks Pasha ordered the Artillery to fire at parties of the enemy who were collecting about 2000 yards away, causing the enemy to disperse. Hicks Pasha came over to see the Governor General and asked his leave to despatch a guide to King Adam of Jebel Tegali and ask him to come to our help, as he had given a promise to aid us before we left Khartoum. The Governor General did not agree to this as he said King Adam was not to be depended on, and if he had wanted to help us he could have met us before now. This discussion was now abandoned and the question of the best road for the army to march by was entered upon. It was decided to start on the 28th and proceed to Alwayah with two days water supply, thence to Kashgil with two days water and finally to Melbeis where a post would be established. The Governor General asked me to go and ascertain from Hicks Pasha if he did not think a reconnaissance in force to capture a few of the inhabitants from the neighbouring villages would not be a good plan, as we were badly in need of information. I went to Hicks Pasha who quite agreed but seemed doubtful if any of the Egyptian regiments were capable

of fighting in any formation except a square, and an attack on a village required more open formation. He said "If I was in command of English troops I should not hesitate, but as it is I will consult with Hussain Pasha and inform the Governor General later on the result of my interview."

October 27th.

We heard that a brigade of infantry with some mounted troops had gone out at 3.30 a.m. and returned without any result. We were surprised to learn that this force had been sent out without the knowledge of the Governor General who knew a force of such composition would never succeed. I was not aware of what Hussain Pasha had decided but heard that he had told Hicks Pasha that it would be dangerous to proceed out by night in square formation, so the expedition was sent out in the morning on a fruitless mission. The Governor General and Hicks Pasha had a conference and the Governor General asked Hicks Pasha to detail two English officers to walk round inside the zeriba at night and see that the soldiers were on the alert. If the Egyptian officers and soldiers know they are being watched by the English officers their vigilance is sure to be increased. We also asked Hicks Pasha to give orders that the troops should live on the country and husband their biscuit rations. Hussain Pasha having brought to my notice a captain of a company who by eating dura had induced his men to follow his example, the Governor General informed Hicks Pasha of this and the captain was promoted major at once.

October 28th.

Started this morning to cross to the western side of the khor. After marching half an hour or so one of our guides came in to say that he had met a Sheikh who wished to come in and surrender and that this Sheikh had gone back to some villages ahead to collect his people. Hicks Pasha collected the army in the form of a square and we waited in expectation but nothing happened so a party of mounted men were sent out towards these villages. They met some men advancing towards them shouting out that they were coming in to surrender. These men when quite close to our troops suddenly opened fire but luckily none of our men were hit and we then knew that a trick had been played on us, but it was foolish to have ever allowed this Sheikh to return to the villages. The army now continued its march and after a short time a heavy fire was opened by the enemy. From an old zeriba Hicks Pasha ordered a zeriba to be formed on the western side of the khor as we had now arrived there. Our artillery opened fire on parties of the enemy who were watering their horses at the khor,

and sniping continued most of the day. There was no doubt that every day the enemy's force round us increased in number. During the afternoon Hicks Pasha visited the Governor General and discussed the situation. The Governor General had also during the day informed Colonel Farquhar that the artillery officers were very dissatisfied and did not like their work being interfered with by Staff Officers.

October 29th.

Hicks Pasha called on the Governor General and again discussed the question of the advance. No traces of the enemy to-day. Hicks Pasha entertained the Governor General to dinner.

October 30th.

Left Rahad by west bank *en route* to Aloba. After an hour's march we were sniped at by parties of the enemy until we arrived at El Bederia at noon. We captured some Arab women on the road who informed us that the enemy were all collecting at El Obeid. The usual zeriba was formed.

October 31st.

Left camp for Aloba, marched about five miles and encamped for the night, sniped at all day on the march.

November 1st.

Proceeded to Aloba, arrived there about midday and formed a zeriba.

Here the diary ends. The rest of the story is well-known—how the march continued slowly until 5th November when the force was heavily attacked by the Mahdi's forces: panic set in, the troops began firing at friend and foe alike until they were completely overwhelmed.

NOTE: The original diary is now in the library of H.M. the King at Windsor Castle, England.

The spelling of place names is left as in the original translation.

THE BIRTH OF A DHOW

By G. R. Millward

Birth-Place :

Ranging from Suez to far Calicut on the western shores of India, dotted down the east coast of Africa, along the barren reef-scarred perimeter of the Red Sea, as far as Quwait at the northernmost end of the Persian Gulf ; anywhere, in fact, where a clear channel in these waters gives easy access to a shelving beach and sheltered inlet : here the tall masts of dhows may be seen slanting this way or that in the various stages of careening and repair.

For building, too, many of these shallow-water harbours are well known among the seafaring fraternity Yanbo, Jeddah, Djibouti, Assab, Bahrein, Muscat, and notably Calicut and Quwait. Occasionally it may happen that someone in a less-known haven may wish to have a dhow built : even Gwiyai, or Flamingo Bay, the little creek some four miles north of Port Sudan where for many years the Sudan's dhow traffic has been mainly directed, has more than once seen a dhow come into being on its beach.

Then, for a few months, the comparative calm is disturbed by a tumultuous hammering and shouting from the reddish-skinned Gehani sailors, big-headed and stocky of body, mostly with bushy black beards, until with the sailing of the new-born ship to distant seas peace once more descends.

The Builder :

In one such case a Port Sudan merchant approached the *Rais* of a dhow he had chartered for several voyages and asked him if he could make the necessary arrangements to have a dhow built at Gwiyai. Tonnage, length, and beam were decided upon and the *Rais*, having sailed laden to Calicut, returned with an ancient, silent Gehani who was the boat-builder, and a cargo mostly of timbers of *Sag*, *Jarrah* and *Fen* wood which the old man had selected for the main timbers from the yards at Calicut, famed for its forests in which trees are trained to the required forms ; ' Y ' shaped for the keel trees, bowed for the ribs, and so forth.

Materials :

For the lesser timbers the boatbuilder counted upon the contents of quite a comprehensive chandler's yard which has come into being at Gwiyai. A first impression of incredible confusion is likely to be modified when it is

seen that whatever is wanted from the junk-heap is forthcoming with but little delay. Most of the space is occupied by a tremendous wood-pile, suggestive of those you see at a farm at home when trees are cut into lengths and piled on end for winter fuel.

Here are logs of every sort of curvature, V-shaped, Y-shaped ; some with single branches, others double. The 'V's and 'Y's are thickest, and may be up to eighteen inches in diameter at the branches, which are from two to four feet long, with a shorter, thicker, butt. The bowed pieces range from a foot to three inches in diameter and from three feet to ten feet in length.

These woods are described as *Sham* (cedar), *Sag* (a sort of teak), *Fen* and *Jarrah* ; while the Sudan provides *Heglig* (or *labob*—*Balanites Aegyptiaca*), *Sunt*, and even *Erkowitz*. *Sag* is the favourite for hulls and main members, but owing to its high cost is often displaced by *Heglig* except for the top strakes of the hull which take most of the wear and tear. *Fen* and *Sham* are used for masts and spars, and often *Sunt* and *Erkowitz* may be used for ribs.

An assortment of planks up to nearly two feet in width by thirty feet long completes the timber range. Logs are often sawn into planks on site ; they are leaned on a trestle about eight feet high, and two men, one standing on the trestle and the other below, between them operate a formidable two-handed saw with a rhythm which is fascinating to watch.

Beside the woodpile is stacked a miscellany of masts, spars, ropes and old sails, and various sizes of wooden blocks and tackles : four pronged grapnels, spikes and rudder fittings abound.

The ubiquitous petrol tin is used for hull dressing, for a selection of bright coloured paints, and for wrought iron nails ranging from six-inch pigmies to giants of two feet or more.

Laying the Keel:

Having made his first selection of timbers, Gabriel, the boatbuilder, had them laid on the beach around the space selected for the building. The huge keel-pieces were then unloaded and brought to the site, about twenty feet from the water's edge.

Five baulks of timber about eighteen inches square and five feet long were placed on the ground, equally spaced, and the keel was laid on them and secured by chocks which butted on to each side of the keel.

The keel was built-up from three solid teak beams totalling about ninety feet long and a foot square, scarf jointed at two points along its length. When this had been done o'd Gabriel looked at it, silently, for an

appreciable time, turning his gaze occasionally in the direction of one or other of the queer-shaped logs which littered the foreshore. His assistants watched with equal silence : this seemed to be a solemn moment, probably Gabriel's next few decisions would decide the seaworthiness of the boat ; he had no blue print, the length of the keel and the knowledge that the dhow was to be 150 tons were his complete terms of reference. Possibly these seafaring men knew this, and respected it.

However, Gabriel came out of his trance, told the men to separate some of the Y's and V's from the others, selected a timber for the stem and set the men to work on it. They worked with a will ; accustomed not only to sailing their boats but also to repairing them, even lengthening them on occasion ; they were skilled in the rough carpentry required, and needed only Gabriel's guiding to be builders.

Stem, Stern, and First Strakes of Hull :

The first day's work was to dovetail the stem and stern into the keel-som at angles roughly of 30 degrees from the ground for the one and 45 degrees for the other.

The next job was to mark lines along the keel by means of a string dipped in coloured pigment, stretched taut and twanged ; and guided by these lines to cut along the entire length of the keel and up the stem and stern posts two vee-shaped grooves. These were two inches wide, three inches apart and about the same depth ; and enormous teak planks with their edges similarly veed were then fitted into the slots, along the whole length of the keel, and butting into the stem and stern posts.

This took several days, and much patience. Planks of that size have a character of their own, and the look of resigned suffering on Gabriel's face, when a last blow, instead of fixing them good and true brought them springing out was more amusing to the occasional spectator than to men who had been at it for days.

At last however they were well and truly laid, and during the next fortnight, with progress which seemed swift by contrast, the lower part of the hull was built, and supporting props were erected from the cross pieces under the keel.

Hull Formers :

The next operation was a tricky one. Gabriel again cast his eye over the set-up, and invoked from the resources of his life's experience the shape of the main ribs, which meant the shape of the hull. These were prepared in duplicate, they were roughly matched for curvature and finally shaped

with adzes with astonishing skill and exactitude. They were not the final ribs, but were the formers, strong enough to define the line of the hull but not sufficiently substantial to be permanent. Even so they were hewn out of logs nearly a foot in diameter.

Three such ribs were set up on each side, one amidships, and the others at points where the beam tended to reduce towards stem and stern. Gabriel took a long time over this operation, repositioning the ribs and altering their flare half a dozen times before they were to his satisfaction.

Warping the Hull-Strakes:

All was ready now for the battle between wood and man which completion of the hull entailed. Most of the available resources, fire, water, leverage, and sheer brute strength were mustered to subdue the unwilling timber into reasonable conformity with the desired contour of the hull planned by Gabriel.

The heat treatment is likely to be of particular interest to boat-builders, and was employed when any considerable or sudden change in curvature was required, or to counteract an undesirable twist which might have taken place during seasoning.

Three stout stakes are driven into the ground, and braced at the top to form a contraption curiously like a huge wicket.

One end of the plank to be treated is passed between one of the two gaps; the other is supported by a rough trestle, usually four or five feet high, and a ten foot spar is braced at right angles to the plank a few feet away from the part to be twisted.

Mud from the sea bed is then plastered along and around the length of the plank where the bend is required, and at the same time a fire is lit beneath it.

Immediately the mud stops steaming the fire is extinguished by throwing buckets of water upon it, and at the same time the lever is pulled upon, and is tied down to a stake when the required twist, plus an allowance for back-spring, has been achieved.

A few hours are allowed for the plank to cool off and set, after which the mud is removed, and the plank brought to the hull for fitting.

Even after this treatment it may require the united, ant-like efforts of up to fifteen men to coax the planks into place, some pulling on ropes attached to levers riveted at right angles along the planks, the ropes being led around stakes driven into the ground at convenient distances, others sweating at tourniquets and all of them without exception adding their full lung power

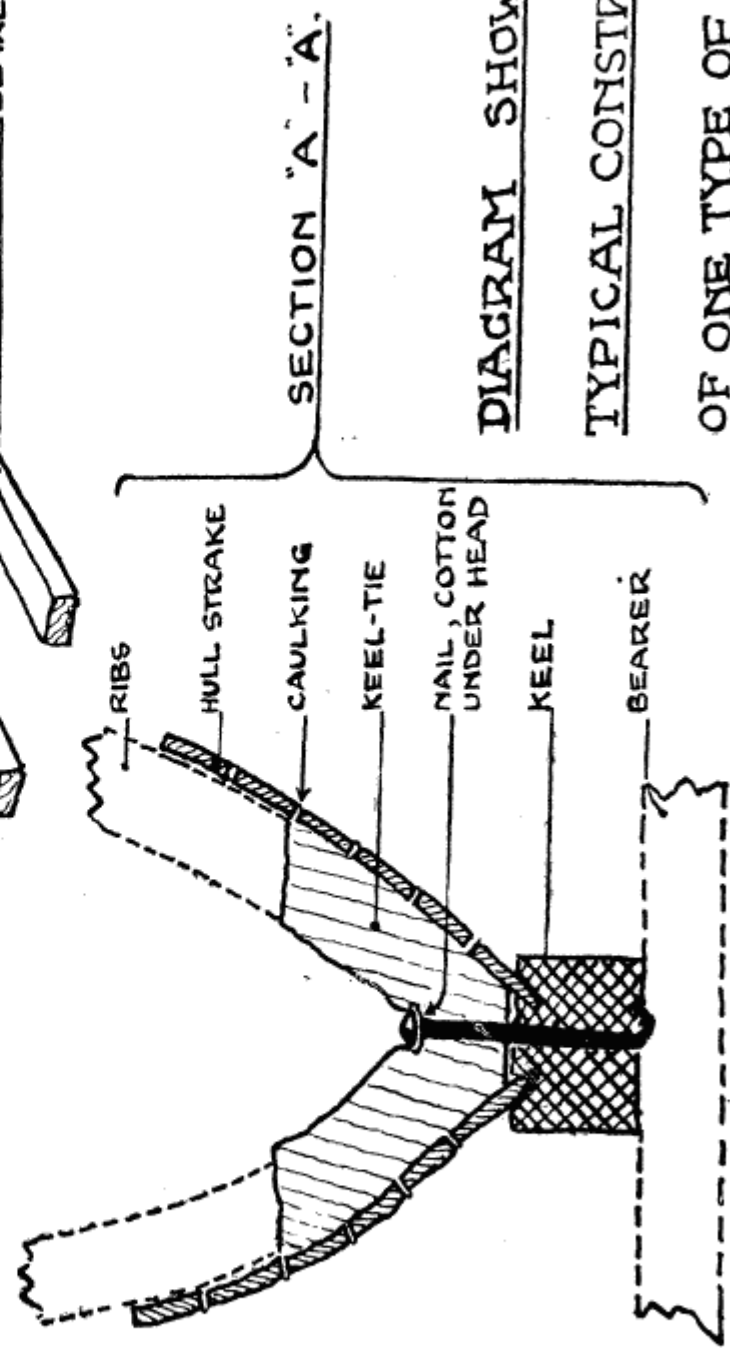
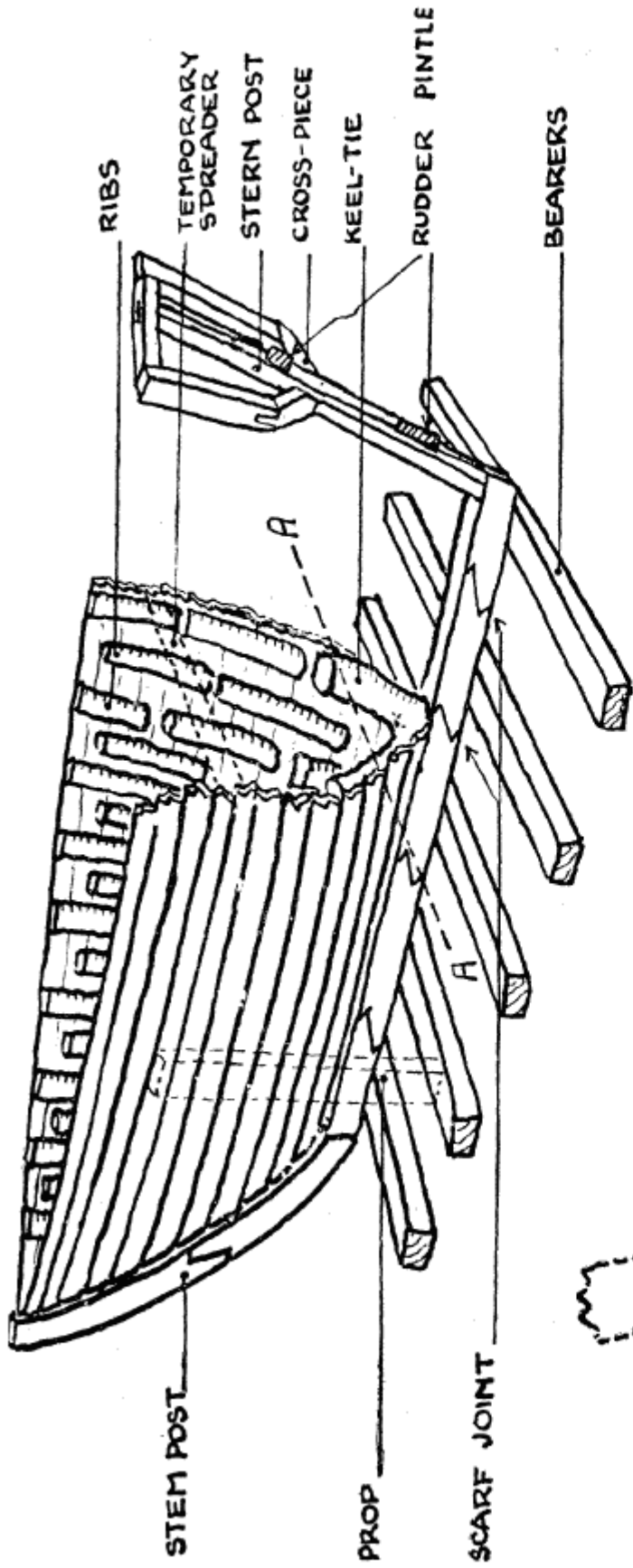


DIAGRAM SHOWING
TYPICAL CONSTRUCTION
OF ONE TYPE OF DHOW.

to the indescribable clamour of hammering, creaking and cursing, but in some strange way all working to the direction of Gabriel.

The keelson planks, as mentioned above, had been particularly difficult subjects. This was because the angle at stem and stern must obviously be vertical, while amidships it must flair out to the projected line of the hull.

After fixing them in position a saw was always passed between the planks to allow a small space for caulking.

The Bottom Timbers:

Two months have passed ; the hull has risen steadily, braced where necessary by temporary thwarts, and the stout timbers which secure hull to keel are now to be put in. It will have been noticed that contrary to usual practice of building the ribs first, here the shell of the hull is first made, and the ribs built into it, under the old man's careful supervision.

At this stage Gabriel produced a long, tattered bag which appeared to contain his more treasured tools. Up to this time the only tools used had been saw and adze. Now, from the old man's manner, we expect something spectacular. But all he produces and handles lovingly is a large leather-thonged bow-drill. Later inspection proved the remaining contents of the bag to be a wooden quadrant divided into sixteen radii with a short plumb-bob hanging from its centre, and an assortment of caulking tools.

A hole was drilled down the centre of the vee of each timber, and through the keel. Into the hole a larger two foot long nail was hammered, until it protruded from the underside of the keel. As always a twist of cotton was wound around the nail head and it was finally hammered home until it was slightly recessed. An iron pad was held beneath the keel to turn the point back into the keel. A formidable log with a square hole cut in it to step the mainmast was keyed roughly amidships to both ribs and keel and a similar pad was fixed aft for the rearmast.

The Ribs:

These Vee or Y pieces having been securely fixed, the work of following the steadily rising hull strakes by the ribs was put in hand. These foot-square timbers, cunningly chosen by Gabriel, overlapped one another vertically by half their length, with foot spaces between them, in all forming an exceedingly strong structure.

An awning of matting on scaffolding was now erected twenty feet or so above the hull.

Completion of Stem and Stern:

The rate of progress was such that a month hence the awning had to be raised still higher, for the time had come to lengthen stem and stern to their final dimensions.

For the stem Gabriel selected a curved timber with a parrot-beak rake, ten feet long.

At the stern a shallow V-shaped eight foot timber was fixed at right angles to the original upright, and the stern strakes, hitherto mating with the stern post, now flared out to meet the underside of the shallow Vee.

Eight feet above, another, but slightly wider, cross piece was jointed to the stern post, the whole constituting the squarish stern characteristic of the *sambuk* (dhow).

Decking in Fore and Aft :

This part of the ship was then decked over, with an eighteen inch hole for the rear mast. The vessel is steered and controlled from this point ; the long narrow rudder, with its heavy wrought-iron gudgeons and pintles, is attached to the stern post, the tiller-arm projecting inboard over the platform.

Forward in the bows another deck was built for the use of men handling the sails, for the look-out, and so forth.

The hull was now virtually complete, the awnings were cleared away, the masts lay ready alongside, ready to be stepped.

Stepping the Masts :

The crews of all the *sambuks* in harbour turn up to help. They seem to enjoy it hugely. Gabriel squats on the top of the pile of matting rolls and watches. He seems content to leave them to it, as though resigned to the inevitable passing of the thing of his creation to other hands. A score of men pull on the ropes, slowly the mast rises above a babel which culminates in a terrific guttural cheer when finally it rests against the beam positioned athwart-ships so as to give the usual few degrees forward cant.

The rear mast, though lighter, is more difficult, for it has to be passed through the hole in the stern deck, but finally this too is in place and the crowd melt away to an orgy of coffee drinking.

Finishing Touches—Sails and Rigging :

The ship at first seems as though she could sail away tomorrow. At a second look it is easy to see from her strangely set appearance compared to that of the other *sambuks* riding the slow wash of the little harbour, that life is not yet in her.

Indeed, there is still a vast amount to be done. Skilled men were culled from wherever they were to be found and set to work upon the sails and rigging. Provision has to be made for making fast the many ropes used for mast, sails, tiller, towing, and anchor ; the matting lately used as

an awning is to be fixed as a lining to the hull, and extended above the sides to arrest spray ; ornamental carving is carried out around the stern and painted with bold bright reds, greens, blues, whites and yellows, and the whole hull has to be caulked with cotton and has to receive its special dressing below the water line and be painted above.

Hull Dressing:

This dressing is of special interest to mariners ; it increases the slip of the hull, is an excellent preventative of fouling, and nail heads as big as pennies show the original blue still upon them when the seeping of dampness inside has rusted the nail's shank sufficiently to warrant replacement. This is remarkable in these corrosive seas. The hull dressing is simply made by heating half a petrol tin of beef suet until it nearly boils, then allowing it to cool until the vessel can be touched without discomfort. An equal quantity of lime made by burning conche shells is then stirred in until the consistency is that of a thick paste. It is smeared on the hull to a thickness of about one sixteenth of an inch. Little attention is necessary during the two-monthly careening when the vessel is taken out of the water for a day or two to kill off the toredo worm, and not for nine months or more is any extensive redressing required.

Launching:

Two more months went by before the vessel was ready for launching ; at last the momentous day arrived. Again, with the entire complement of at least a dozen dhows milling around in a state of excitement Gabriel remained aloof, his face expressionless. He watched the four enormous baulks of timber laid down to the sea and greased, and the stocks taken away so that letting off ropes on the far side would allow the ship to rest upon them on keel and belly, and watched the slow, complaining, ungainly motion of the tilted vessel down to the sea as the men pulled on blocks and tackles.

Once for an instant did a faint smile cross his face, when a boat to which some optimistic person had attached one of the ropes dragged its anchor and came up out of the sea and smote the frenzied mob, oblivious of warning cries, from behind.

But again, when the ship finally left the shore, and with a mammoth heave righted herself to an even keel and became proudly alive, Gabriel gave a slight smile, and a nod, as though to say " she'll do !."

Then he went around and collected his adze, his saw, hammer and caulking tools, and packed them with his drill and quadrant.

He was ready for his next job.

NOTES.

Note 1 : Larger Dhows: The hull of the 150 ton *sambuk* above described is open except for the small deck forward and the tiller deck aft. Above this tonnage *sambuks* may often be decked over with hatches, and will very likely be provided with a bowsprit.

This is by no means a case of *fantazia* for it allows the mainsail to have more over-reach in an area giving that lift which in these vessels tends to raise their bows out of the water.

The impression so often gained by an observer that the vessels are almost literally riding the waves is largely due to the unusual buoyancy arising from this uplift, which also of course increases their speed.

The two hundred tonner may possess a gangway, a binnacle, wheel, windlass, large metal water tanks, and be equipped on the deck aft with an awning under which are comfortable seats with cushions.

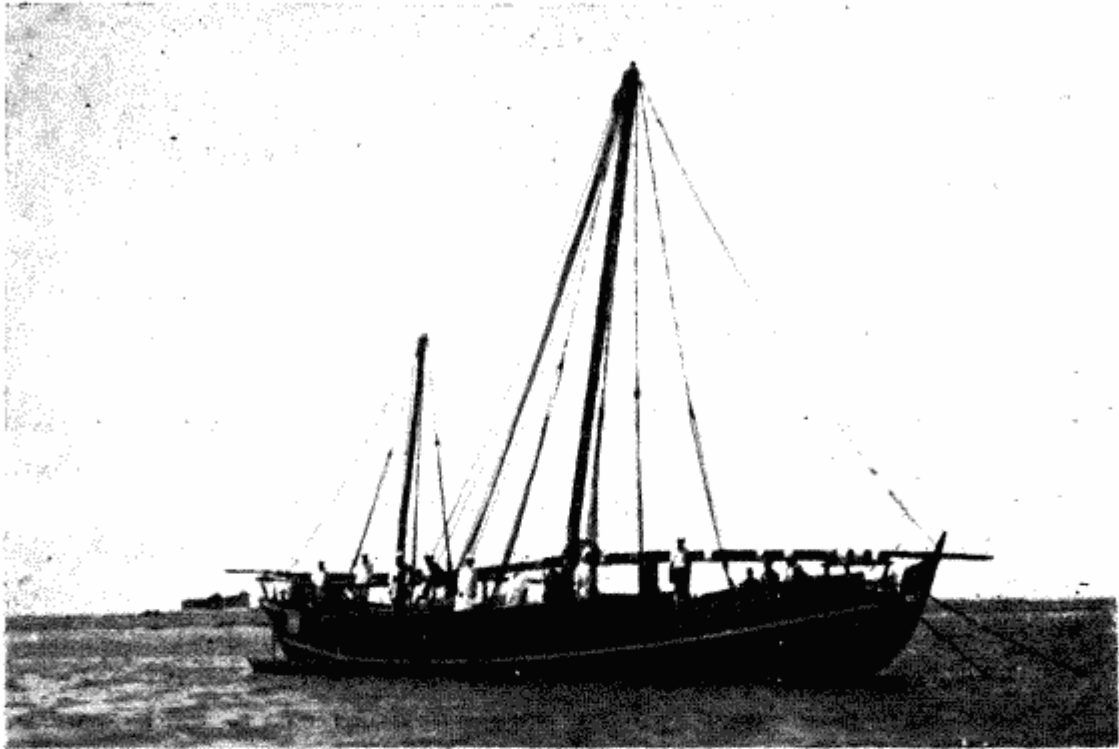
This is the *Rais's* kingdom ; you may be shown, and with pride, one or two cabins down below, but the *Rais* will usually convey an impression that they are for the use of odd people (obviously he thinks them rather sissy) who somehow or other cannot take it on deck.

There will also be a commodious storeroom, and probably a lavatory, or even two, clinging like barnacles to the ship's stern. These are usually waist high, drum shaped, and are provided with a tin can on the end of a long rope over a pulley, which may be dipped into the sea as required.

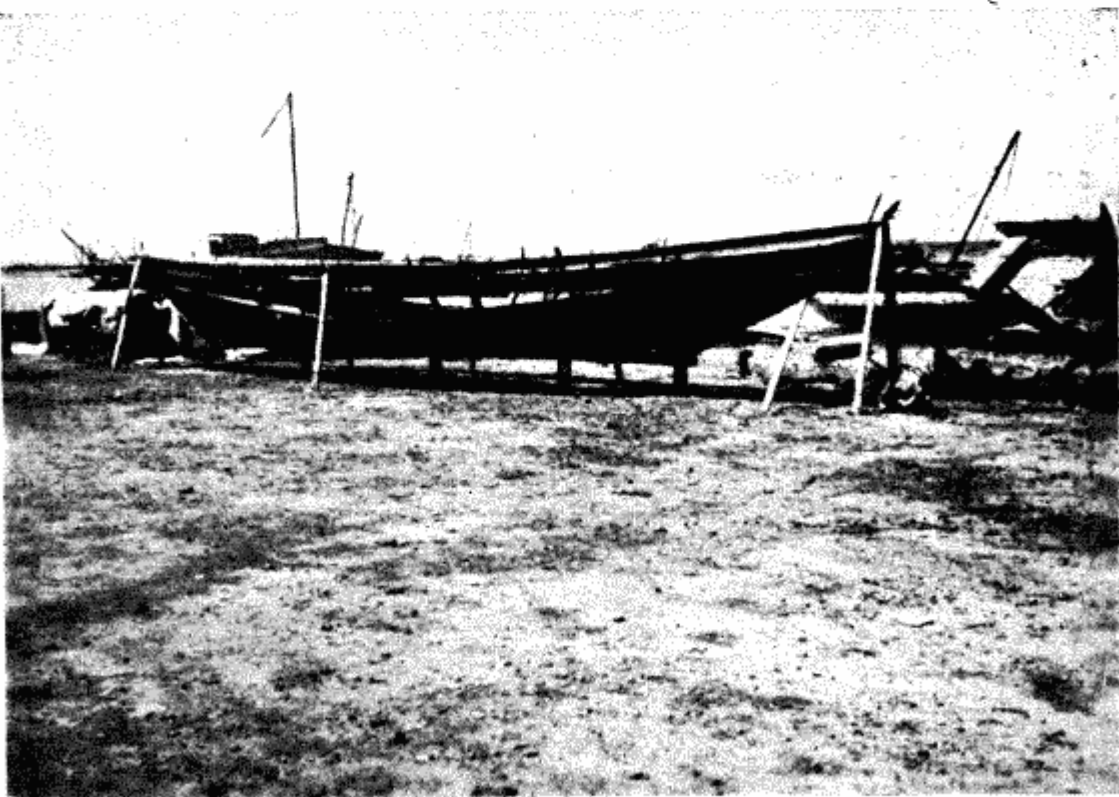
Lastly and perhaps more surprising than anything else, there is usually a heavy eight-oared galley capable of taking the entire crew. It rests upside down on deck and there are no davits. It is difficult to see how it can possibly be launched during a storm, and one can only assume that having been righted by the crew, launching is automatic when the parent ship sinks beneath it.

The pattern of the dhow mostly conforms to a square-stern-sharp-prow type for all tonnages, though there are two notable exceptions ; Kuwait which produces dhows with narrow sterns and Yemen whence come dhows pointed both stern and stem. The *Raises* could give no special reason—seemingly it was the fashion of the place to build them so.

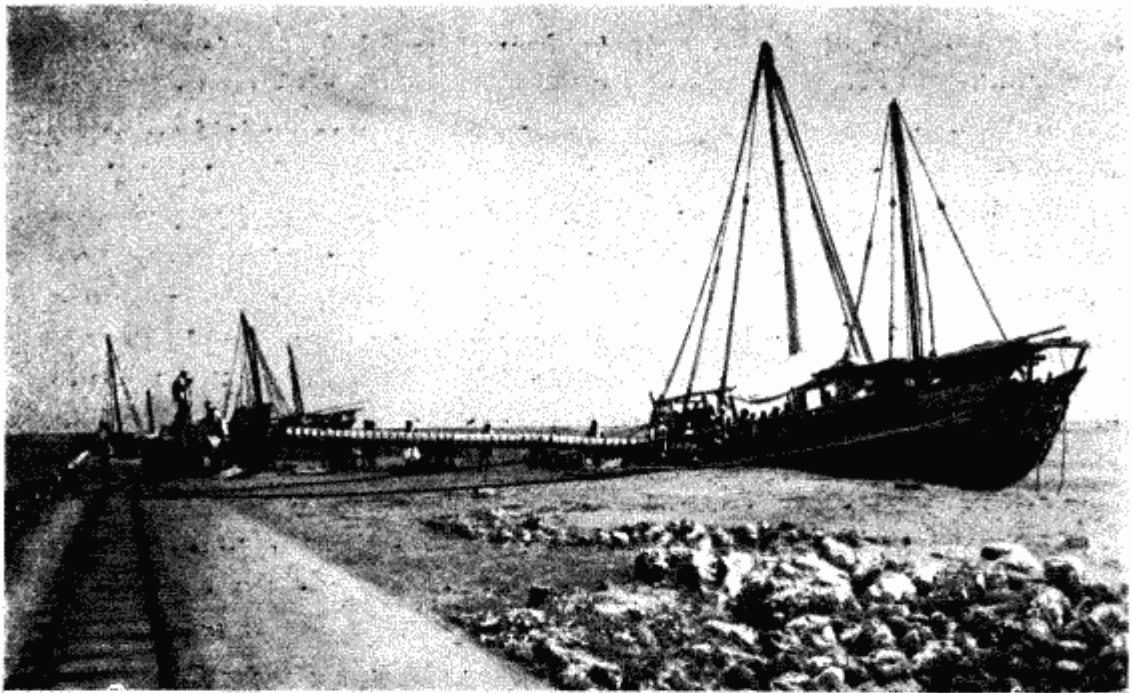
Whatever size these ships may be, one of the most fascinating features of their building is the continual compromise between requirements and materials ; when the material cannot be coerced to suit the requirements of the builders, their ingenuity must discover a practicable solution which may involve many concurrent amendments in design.



A TWENTY TONNER



IN THE SHIPYARD



LOADING PETROLEUM AT QUAY



GENERAL VIEW OF HARBOUR

Note II : Costs: According to enquiry among the various *Raises* a dhow could be built at Gwiyai for about LE. 30 a ton at the present time. This cost includes masts, sails and rigging ; thus the 150 tonner described would now cost about LE. 4,500. A 150 ton dhow making, say, ten trips to Aden in a year with cargo at LE.3 per ton would expect a gross revenue of L.E. 4,500, the cost price. It would thus not require many years, even if half laden, to recoup the capital outlay, and it is easy to see whence comes the urge to build, and also the traditional reluctance of owners to part with these vessels. The insurance quoted on a two hundred ton dhow from Kuwait lost at sea a few years ago was reported to be L.E. 5,180, which scans out with the present day figure of L.E. 30 per ton, allowing a slight rise in prices since that time.

Sails average 500 m/ms. per square yard ; two sails for a 50 tonner cost about LE. 120 and sails for a 150 tonner may cost as much as LE. 400.

Hull dressing costs nearly LE. 2 per tin, and one tin is required per five tons, thus LE. 60 would buy hull dressing for our 150 tonner.

Nails averaging a piastre each are quite an item, for upwards of 5,000 may be required for a ship of this size, but undoubtedly the most serious outlay is for the timber which in the case of inch and a half teak may, the *Raises* say, reach the astonishing figure of LE.1 or more a foot run.

Note III : Sails: The smaller sail for a fifty tonner would be a triangle with a height of seventy two feet and a base about half this dimension. For a 150 tonner the smaller sail may be about 120 feet long. The larger sails are a third longer and higher, all being much the same shape.

The "canvas" sometimes resembles a heavy close-woven *damuria*, though a lighter, and even closer-woven fabric is favoured if procurable, No sail dressing was seen.

Strips of roughly two feet in width are stoutly sewn together, and then to double ropes around the edges. They are roped to spars along their long sides, and the spars are secured to the masts at a point about a third along their lengths. The masts look dumpy by comparison.

Note IV : Cooking: The large dhows may have a small covered fireplace with a clay hearth to serve the *Raises*, and a galley for the crew with several clay fireplaces and huge copper vessels, all substantially protected from the weather though not enclosed. The food, apart from millet, is mostly fish, which is dished up in various ways, such as a fish curry with a predominance of onion. While the actual taste of this is not as bad as it possibly may sound to some people, the fiery aftermath on an unaccustomed palate was such as to remove all sense of taste for hours afterwards.

The smaller dhows make an ingenious and exceedingly safe stove by thickly plastering with clay from the sea bed the inside of a wicker basket

rather like the old fashioned laundry basket, or a large edition of the raffia covering which protects a Chianti bottle, but with an open weave, and extending higher, narrowing to a hole about a foot in diameter.

When the clay has set a fire is lit inside and the clay is baked until it is quite dry. More clay is inserted in any cracks which may appear and the process is repeated until the vessel is sound. A round metal lid just slightly larger than the mouth is then made for it.

Wood is burned, and a draught is obtained, when it is desired to coax up the fire, by tilting the lid partly inside the mouth. Saucepans may be heated on the stove but it is more extensively used for baking millet dough. The still glowing embers of the fire are raked out and dollops of dough as big as two fists are slung on to the hot inside surface, where they adhere. The lid is replaced and after a time the cook has a look to see if any have fallen off. If they have they are ready for consumption. And very good they are.

Note V : Cargoes : Cargoes from the Sudan are mainly coal, benzine, kerosine, barrelled lubricating oil, cocyan shell, and upon occasions cotton from Trinkitat to be ginned at Suakin.

There is considerable traffic to Jeddah, at LE.1.200m/m per ton for the voyage of three days outward and one day homeward. Suez, at LE.2.500m/ms per ton, takes 25 to 30 days outward, and seven to ten back, while cargo to Aden costs LE.3.000m/ms per ton on the eight to ten day journey there and fifteen to twenty days beating homeward up the Red Sea.

(The figures quoted were in most cases obtained early in 1951 from the *Raises* and cross-checked whenever possible, and are thought to be reasonably accurate.).

Acknowledgement : The kindness of R.E. Winnell Esq., of the Marine Section, Port Sudan Harbour, in vetting from a marine viewpoint is acknowledged with thanks.

ملخص

يصف هذا المقال بناء سفينة (سمبوك) حمولتها ١٥٠ طنا بالقرب من بور تسودان في مراحلها المختلفة من وقت اعداد الخشب الى ان اصبحت السفينة جاهزة للابحار ويضيف الكاتب الى ذلك بيانات عن قيمة تكاليف بناء هذا النوع من السفن واجور نقل البضائع فيها

THE HISTORY OF DARFUR 1200-1700 A.D.

By A. J. Arkell.

PART II

CHAPTER V.

The Tungur.

The Tungur have been an interesting problem ever since their empire was first made known to us by Barth. There seems no reason to doubt that their first kingdom was in Darfur, or that they were ruling for a time in Wadai after they had lost their supremacy in Darfur. They were then driven out of Wadai by a rising in which native antipathy to them as foreigners was combined with a religious crusade against them as pagans, and in this crusade the Arabs, who had recently arrived from the east, probably played a part. While those Tungur who had intermarried with the inhabitants of the land tended to stay behind in both Darfur and Wadai, the purer Tungur fled from Wadai to Kanem, where they have been for some time.

Barth¹ states from information collected in Bornu and Bagirmi that soon after Leo Africanus "visited these regions, the pagan nation of the Tungur extended their empire from Dar Fur to the very borders of Bagirmi, The Tungur, of whose original language I have not been able to collect any specimen, and which seems to be almost extinct, are said to have come from Dongola, where they had separated from the Batalesa, the well-known Egyptian tribe originally settled in Bénésé".²

Nachtigal, who studied the Tungur in Kanem, Wadai and Darfur, came, as we have seen, to the conclusion that the Tungur sprang from the Bani Hilal, being apparently led to this decision by the fact that he found this tradition held by the Tungur in Darfur, Wadai and Kanem, and that the pagan Tungur of Abu Telfan in Wadai held that their ancestors came from Tunis ; further their chief in Darfur still claimed the Arabic title of sultan, and wore the *litham*, as was never the case with Sudanic elements.

There is, of course, no question of their being Sudanic ; but though the turban may be an Arab institution, the *litham* is typical of the Tuareg, who are Berbers. There are various reasons for thinking that the Tungur

¹ *Travels*. III. 429, 430.

² This sounds like the tradition of a connection between the Tungur and the kingdom of Meroe (probably destroyed by Axum c. 350 A.D.)

had a Berber (? Tuareg) origin, a possibility which MacMichael mentioned only to dismiss. First and foremost is the black *litham*¹ which was worn by the Tungur sultan, and which was first mentioned by Tunisi, although in Dr. Perron's translation it was called a black turban. Nachtigal is correcting Tunisi who called it a turban, of which the *litham* forms apart in the royal headdress of the west,² as worn to-day (in white) by the Sultan of Dar Masalit. Tunisi says³ that when he asked the Tungur 'sultan' why he wore a black turban, the latter said it was a sign of mourning for the dominion over Darfur that had been lost by his ancestors — an unlikely explanation, but such as might be advanced by an African who had forgotten his real Berber origin and was claiming Arab descent.

The use of black veils by the noble Tuareg is well known. I need only quote F. R. Rodd :—⁴

"The confusion reigning on the subject of the 'Black' and 'White' Tuareg in the minds of the few people in Europe who have ever heard of the race is due to the practice in the north of the servile wearing a white, and the nobles a black, veil. But a 'Black' Tuareg, being a noble, will in the vast majority of cases, have a much fairer complexion and more European features than a 'White' or servile Tuareg."

And Barth⁵, who, in his description of his journey along the Niger towards Timbuctu, writes :

"All the Tawarek hereabouts almost all of them wear round the lower and upper part of their face, a shawl composed of strips of different colours and materials : *only the chief himself uses a black tobe, and a shawl of the same colour.*"

It would thus seem that we have some cause for believing that the original Tungur culture was Tuareg, even if they are not of Tuareg blood. Nachtigal's reasons, therefore, for thinking the Tungur to be Hilal Arabs appear unconvincing, particularly in view of his own footnote to his discussion of the 'Arab' group of inhabitants of Kanem, among whom he classed the Tungur, Aulad Suliman, Magharba and the Arabs proper, the Shuwa,⁶ to the effect that 'Arab' did not here mean that their origin could be traced to Arabia. An aristocratic minority of foreign origin often in the course of time forget their mother tongue, and adopt the language of

¹ *Sahara und Sudan III*, 450.

² *Darfour*, p. 128.

³ MacMichael, *History I*, 114.

⁴ *People of the Veil* p. 139

⁵ *Travels IV*, 350. Compare also *Tunisi Voyage au Ouaday* p. 524 : the chief of the Tibu Rashad had a black *litham*.

⁶ *Sahara und Sudan II*, 302 n. Nachtigal admits elsewhere that he started with the idea that the Tungur were Arabs.

their more numerous subjects, which they hear used around them in every day converse. To deduce a racial origin from the use of a language is always unsound.

Further Carbou has produced some weighty arguments against the Arab origin of the Tungur, although he apparently came to the conclusion that they were a hybrid Arab-negro tribe,¹ and thought that the Arab blood in them was Hilal. He states that the Tungur of Kanem are quite distinct from the other Arab tribes². Although they claim an Arab origin, they never call themselves Arabs when asked to what tribe they belong, but always say Tungur; and they pronounce Arabic somewhat imperfectly, using some words peculiar to themselves.³ They speak Kanembu and Tibu as well as Arabic. They are not good Muslims, being addicted to alcohol. Nor do they practise female excision, as do all the Shuwa Arabs.⁴ (Although Carbou records the Tungur tradition of a time when they lived on the banks of the Nile,⁵ the fact that they do not practise female excision alone indicates that they have no cultural connection with the Arabs of the Sudan, who have practised it for centuries.) Their chief is called by the Tibu title of *foughou*¹; and there is a persistent tradition that when driven out of Wadai they were still pagans. Carbou's description of the remnants of the Tungur aristocracy as they exist to-day in Kanem seems to suit a people of Berber rather than one of Arab ancestry, if only we can account for the general tradition of their Hilal connection.

Some further evidence of the Berber origin of the Tungur is to be found in a modern Wadai MS published by Sir Richmond Palmer⁶ which contains the following passage:

"We have found it recorded from olden times in the *Tarikh al Sudan* as follows: 'The tribes which came to middle Ifrikia after the time of the 'Umayyad, 'Abbasid, and 'Alid dynasties, and the Fatimid dynasty of Masar, rose up in the time of the Seljuk and Mamluk (Ubaidi) dynasties which eventuated from the 'Umayyad and 'Abbasid empires, and conquered the Sanhaja and Andulus, after the fall of various nomad chiefdoms, as also Ifrikia in the west of Masar.

¹ *Tchad* II. p. 1.

² *op. cit.* II. p. 17.

³ *Tchad* I. pp. 82. 83.

⁴ *op. cit.* II. p. 17.

⁵ *op. cit.* I. p. 74.n.

⁶ *Sudanese Memoirs* II p. 54. dated 1928; and in a paper on 'The Kingdom of Geogha of Leo Africanus' published in the *Journal of the African Society* Vol. XXIX. p. 365, in July-1930. As the two-translations differ somewhat, I take it that the later is the more accurate.

' There then pressed into the Sudan, by reason of the constant fighting that was going on, an enormous number of Zenata and others. Among these there came to middle Ifrikiya, and to the capital of the land of Fur, Zaghawa, Bulala, Babaliya, Bideyat, Tunjur, Makada and others. Now the rule in Darfur belonged to the Zaghawa. *From among the Anej and Bideyat came the ancestor of the Tunjur to Wadai, where he established his rule.* "

The Anag, or as they are also called, the Abu Qonaan, are the traditional early Berber inhabitants of Kordofan and the upper Nile Valley, to whom in most of the eastern Sudan are now attributed all pre-Arab remains including those of Christian Nubia, Meroe and ancient Egypt. Their Berber origin is disclosed by their alternative name, the Abu Qonaan, and their name is probably a survival of the Tuareg expression for the 'people of the east,' *Kel annag*¹. The name may have become localized in northern Kordofan in the thirteenth century, (see ch. 10). The expression probably referred originally to an eastern branch of the Tuareg who did much of the carrying trade for the kingdom of Meroe, the remains of whom have either become absorbed in the Kababish and other Arabs, or were driven west of Tibesti to their present homes by those Arabs. Numerous traces of the cultural influence of Meroe may be found among the modern Tuareg². We shall soon see that the Tungur did come from the Bedayat.

I considered for a long time all that was known of the history of the countries around Darfur that might have provided it with the Tungur dynasty; and I found my first clue to what seems to be the truth in the work of the French traveller Lejean who visited the Sudan (1860-64) including El Obeid, the capital of Kordofan. There he collected much valuable information about the ethnology of the country between Kordofan and Lake Chad. He was informed,³ possibly by the Musaba'at, that the Tibu in Darfur were called Tungur as in Wadai they were called Gorān, on which he comments that it is probably more correct to say that the Tungur and Goran are tribes of the negro family of the Tibu. If the Tungur are of Tibu origin, it must have been nearly forgotten eighty years ago, and seems to have been quite forgotten to-day, except that the Tungur of Jebel Hereiz in central Darfur recognize their relationship with the Biriara, the chief

¹ *Annag* or *Innek* in Tamashek means 'east.' *Kel annag* may refer to Tuareg or others. It was pronounced exactly *Kel anag* by some representatives of the Tuareg Kel Ahurma from near Timbuctu, who passed through El Fasher on the pilgrimage. See also F. R. Rodd *People of the Veil* pp. 369 and 441.

² See 'Meroe and India' in *Studies presented to O.G.S. Crawford* now in the press.

³ Lejean *Voyage aux Deux Nils*. p. 189,

section of the Bedayat of Bao, and maintain some degree of social intercourse with them, although their spheres are now separated by more than two hundred miles. The Tungur, presumably in view of their pretensions to Arab ancestry, do not advertise this intercourse, and I discovered it from the Bedayat. They informed me that the Tungur are descended from emigrants from all the four sections, Itinga, Burunga, Kuriara and Urara, into which the royal section, the Biriara, is divided. They say that these emigrants came to Darfur and developed into the Tungur.

The Bedayat call themselves in their own language Tuba, and they look on the Zaghawa of northern Darfur, their neighbours, as composed partly of Bedayat like themselves, and partly of their rulers, foreigners from Bornu, except that they consider the Zaghawa Kobe, whom they call Beri Kubara, to be Daju. They consider that the Bedayat are by origin nomads (Bedu) who came from Arabia before the time of the Prophet. They were camel-owners, and came to their present habitations at Bao and Umm Geras *via* Merga in the Libyan Desert. This supports my belief that the Bedayat and some of the Meidob belong to the same stock as the Beja of the eastern Sudan, *i.e.*, an early branch of the Brown race akin to the pre-dynastic Egyptians. There are various reasons for this belief, but it would be out of place to give them here. The relations between the Bedayat and the Tibu of Tibesti have not yet been fully studied, but it will probably turn out that the Tibu and Bedayat all belong to the same stock. The Bedayat name for themselves, Tuba, indicates as much. The Tibu have, however, unlike the Bedayat, been influenced by the culture of the Tuareg, from whom they must have adopted the use of the veil.

Nachtigal was the first to visit Tibesti and to study its inhabitants. They gave him, however, such an unfriendly reception that he lost all his original notes and very nearly lost his life. He says¹: 'the people of Tibesti call themselves Teda. At one time they spread over the surrounding desert.' The oasis of Kufra was certainly named 'infidels' because they used to own it. 'Later many of them migrated south, and thus representatives of most of the Tibesti sections are also found in Bornu and Kanem, many of them having only recently arrived there. Kawar has long been inhabited by Teda. Two dialects of their language are spoken, and the whole stock, who have no common name for themselves, may be divided into Teda (inhabitants of Tu or Tibesti and Kawar) and Dāza (inhabitants of Borku, Bahr el Ghazal and Kanem). The Arabs call the former Tibu

¹ *Şahara und Şudan*, I. p. 420ff.

and the latter Gorān. The name Tibu (or rather Tu-bu) displays the Kanuri plural ending -bu. The people themselves call their language *modi Teda*. Tedé is the singular of Teda, but it is never used alone without Tu, *i.e.*, Tede-tu, a Teda of Tibesti, which is a proof that the word Teda once included other divisions of the family, (which Nachtigal thinks it no longer does, but possibly the Meidōb of northeastern Darfur, who call themselves Tiddi, are another branch). 'Occasionally the expression Tede-emi is used as synonymous with Tede-tu, indicating that Tu, the old name for Tibesti, means *emi*, *i.e.*, "rock" or "hill."

A more recent writer on the people of Tibesti, Lieutenant Réquin, of the French Infanterie Coloniale, states¹ that Teda tradition remembers a time in the past when there was more rain, better grazing and a correspondingly greater population, until a severe drought emptied the *massif* of most of its inhabitants. No doubt as the grazing and water supply diminished, the inhabitants of Tibesti had to move south to Borku and the western Bahr el Ghazal. Why too should not those living further east along the Wadi Howar, and in the area between J. Teiga and Tegarū, (where there are many traces of permanent human habitation in country that is now desert and only accessible to the nomad after good rains), not have moved south into Darfur? The Zaghawa and Masalit in particular still talk of a time when the southern fringes of the Libyan desert and the oases of Merga and Natrun were inhabited. As life became more difficult for these people due to the advance of the desert, they must have pressed increasingly on their neighbours in more favoured lands. It is probable that this process had not been completed by the time of Leo Africanus, and that it is that to which he refers in the well known passage²: 'The King of Nubia maintaineth continual warre, partly against the people of Goran (who being descended of the people called Zingani, inhabit the deserts, and speak a kind of language that no other nation understandeth) and partly against certain other people also dwelling upon the desert which lieth eastward of Nilus, and called Bugiha.' Till recently the Gorān occasionally crossed the desert, and raided the fertile valley of Qa'ab west of Dongola.

MacMichael clearly recognizes the Tibu influence in northern Darfur. He says: "One might describe the general ethnological aspect of Darfur as distinctly Tibbu in the north and negro in the south."³ Now the royal

¹ In an article entitled 'Les Clans Tedda du Tibesti' published in *L'Afrique Française*, January, 1935.

² Leo Africanus, tr. Pory in the Hakluyt series, vol. II. p. 836.

³ *History*, I. p. 115.

tribe *par excellence* among the Tibu is the Tomaghera, or Tumagera, as it is spelt to-day in Bornu. They are first mentioned in the account by Imam Ahmed of the first twelve years of the reign of Idris Aloma king of Bornu (1571-1603).¹

We learn from Nachtigal that the four families of the Tomaghera in turn provided the chief (*dardai*) of the northern Teda in Tibesti², who alone was entitled to wear the royal turban and *litham* (*qodmula*)³; that they also provided the chiefs of the Teda inhabitants of Kawar oasis⁴; and that in Bornu the princes of Munio in the extreme north and of Mandara in the extreme south are Tomaghera. Barth, who considered that their name was a Berber one⁵, thought there could be scarcely any doubt that they had given their name to the province of Damagherim, of which the initial letter was probably a ط. At Ngimi in Kanem Nachtigal found a settlement of Tomaghera, who were generally reckoned as Kanembu, although their physical characteristics reminded him of the Teda⁶. Nachtigal thought the Tomaghera represented the earliest Teda migrants to Kanem, and said that although they lived with the Kanembu or as Kanembu, their Tibu origin was here and there recognised; while in Bornu proper, they lived as an acknowledged Kanembu tribe, with a certain knowledge of their affinity with the Tibu sections of the same name. In Bornu he noticed that they are scattered round the periphery of the kingdom.

Is it so unreasonable to suggest that a family of Teda origin and of such royal traditions that it still provides chiefs in Tibesti, in Kawar, in Munio, and in Mandara, may also have provided a royal family in Darfur, where Tibu influence is admittedly prevalent, and has almost certainly been even greater in the past?⁷

If it were possible to make the necessary enquiries in Bao and Tibesti, it is probable that a connection could be traced between the Biriara, the chief section of the Bedayat and the Tumagera, the royal section of the Teda, and in that case there would be no missing link in the chain of evidence. As it is this theory supplies the best explanation of Ahmad al Ma'agür, the traditional ancestor of the Tungur. Ahmad the Hamstrung is unknown outside Darfur, and has all the appearances of being a legendary eponymous ancestor. If, however, the Tungur were once the Tumagera, their name

¹ Barth, *Travels*, II. 275.

³ I. p. 442.

⁵ *Travels*, II. 275.

⁷ A Teda connection with Meidob is indicated by the fact that the original royal section, now represented by Melik Abdallahi Hasan, is known as the Tirti. This must be derived from the Teda word *dardai*, meaning chief.

² *Sahara und Sudan* I. p. 440.

⁴ I. p. 543.

⁶ *Sahara und Sudan*, I. 566, 567.

would be arabicized into Tumagerawi, as soon as Islam became the court religion in Darfur ; and it is not difficult to see how Tumagerawi would change to Tungerawi (plural Tungur) for the sake of euphony. We have already noticed an example of the same process in the change of the name Simyar to Senyar.

The Tungur in Darfur are almost invariably called the Tungur Kirāti, particularly by anyone with any claim to authority, when asked to what tribe he belongs. Several other sections of the Tungur are mentioned by MacMichael¹ of which one seldom hears in Darfur. He gives the Kirati as the ruling family at J. Herēiz, and states that the Ingunga are said to be a branch of the Kirāti. Dar Inga was one of the chief centres of the Tungur in Darfur, but it was broken up by later Fur sultans, who made the eastern part into a separate command under the *shartai* of Dar Hamra. Besides the Tungur of Inga, the Omda of Kheriban (north-west of El Fasher) and the people who claim to be owners of the site of the ruined walled city of Uri in northern Darfur say that they are Tungur Kirati. Now Carbou² informs us that the Tibu name for the Tungur is Kirada ; and Barth³ shows that *da* is a common termination for the names of people in Teda (Tibu). If then we are correct in supposing that the name Tungur developed from Tumagera in Darfur, we have an explanation of the phrase *من اهل كرا* in Imam Ahmad's history already referred to, which has puzzled historians ever since Barth discovered the document.⁴

The name Kirati undoubtedly means 'royalty'. The *shartai* of Hamra, on being appointed by the arabicized Fur sultans of Darfur to a slice of the old Tungur Kirati area of Inga, translated the word Kirati literally when he described his family as Dowlunga, which is compounded of the Arabic *dowla*, a 'realm' and the Fur plural termination for 'people.' The name Kirāti may thus be connected with the group of words meaning 'chief' which we met in discussing the name Konjara, the aristocratic or noble section of the Fur ; and it is certainly cognate with *kiri*='sultan' in Zaghawa, and probably with *gere*='king' in Meroitic.

In addition to giving a likely explanation of the name Kirati and the expression *من اهل كرا* applied to the Tumagera in Bornu in the 16th century, the supposition that the Tungur were originally Tumagera offers a plausible explanation of the Tungur claim to be descended from the Bani Hilal. Apart from the fact that the Tungur or their *soi-disant* descendants the Fur Keira have also at times claimed to be Koreish or

¹ *History*, I. 71.

² *Tchad*, I. 249.

³ *Sammlung*, I. LXVII.

⁴ *Travels*, II. 275.

'Abbasids, both of which claims are highly improbable, there are other reasons for discounting the widespread Tungur tradition that they are Bani Hilal, which seemed so weighty to Nachtigal.

In the first place the Hilal invasion of North Africa was likened by Ibn Khaldun to that of a swarm of locusts. Pouring in from Upper Egypt in large numbers, the Hilal and their companions brought the desert with them. It was the worst cataclysm experienced by North Africa. They are said to have given an anarchic example to the Berbers, and to have weakened in them the idea of regular government that had been previously none too strong. The hills of Morocco alone provided a breakwater against this destructive flood. Everything else in Barbary fell to pieces, and many Berber tribes were driven into Saharan regions. Not even in the course of subsequent history did the Hilal found more than one small dynasty and that only lasted a very short time.¹

It is unlikely then that a small party of Bani Hilal should have been the first to introduce well organized government to the negroes of Darfur. It is equally unlikely, as MacMichael realized, that they would have found their way across more than 1,300 miles of desert country largely controlled by Berbers whom they had alienated by their savage behaviour ; yet Tungur tradition is unanimous that they came from the north, from Tunis, and not from the east. There seem to be a few Bani Hilal among the Shuwa Arabs of Lake Chad, who came from the east via the Nile², and their companions the Seleim are represented among the Baggāra Arabs of the White Nile, but to this day these people have no interests outside their pastoral life and their cattle.

Further, as is becoming clearer in the course of this study, there were few, if any, Arab characteristics about the dynasty established by the Tungur, but all that we can discern of their institutions at this distance bear the marks of the pagan Berber. When, after the introduction of Islam to the Tungur court, an Arab genealogist was requested to prove the Arab descent of the ruling dynasty, he would naturally have looked for a name in common use in connection with the ruling family, with which to connect one of the well known Arab tribes. If they, being Berber nobles, were addressed as *ilala* or *ilella*, i.e., 'nobles,' he would be very likely to have picked on the Bani Hilal. The Tumagera having come from the north (Tibesti), and the well known cycle of legends about the Hilal hero Abu Zaid being largely connected with his adventures in the region of Tunis al Khadra, it would be natural to invent the story of their ancestor having come from Tunis to

¹ E. F. Gautier, *Le Passe de l'Afrique du Nord*, I. p. 412, 416.

² The Hilal section of the Isiya tribe.

Darfur. How then explain the earlier form of their name, Tumagera, which was presumably still remembered, if not still in use? There is no word containing the four consonants T M G R in Arabic; but the past participle *ma'qur* i.e., 'hamstrung,' (pronounced *Ma'gur* in the Sudan) provides the remaining details of the story.

A trace of the use of this Berber word for nobles seems still to survive today in the western half of the Anglo-Egyptian Sudan, where an extra fine bull is sometimes described as *tor kilaly*, a 'noble bull.' There is no possible Arabic derivation for the expression *kilaly*, and both the forms *ilala* and *Kilala* occur in the traditional songs of the Bulāla, a cadet branch of the Kanem Bornu royal family, who drove the ruling family out of Kanem in 1386 and held it for 122 years. In these songs the rulers are apostrophized as *Kiyi-ilāla* and *Kelāla*; both forms occur. These songs have been published by Sir Richmond Palmer.¹ In one of them the chief is described as a Tuareg, i.e. 'red grandson of a king, with the black mouth-veil and armlets of black stone,' but I do not follow Sir Richmond in his identification of the Kayi with the Kindīn (the Bornu name for Tuareg, which becomes *Kinīn* in Darfur). His explanation of *ilala* or *ilella* as the plural of *ili*, meaning 'free man' or 'noble' in the language of the Tuareg seems reasonable.²

The amount of coming and going along the great high road from west to east that runs from Lake Chad through Wadai and El Fasher, and in particular in connection with the pilgrimage since Islam became general in this area during recent centuries, is sufficient to account for the widespread nature of the legend that the Tungur were in origin Bani Hilal from Tunis. We have seen that the Tungur are said to have been still pagans when they reached Kanem, but the spread of Islam and the consequent prestige in those areas of having an Arab ancestry would be sufficient

¹ *Sudnese Memoirs*, Vol. I. pp. 7-10., and *Bornu Sahara and Sudan*, p. 181.

² The Kayi must be the same as the Kai, who, in the early days of the kingdom of Kanem, furnished wives for the rulers, as did the Tumagera, and who Nachtigal informs us (II. 336) for a long time in Bornu held a special position, and (II. 418) had previously been Dāza (Gorān) in Borku. There is still a section of the Gorān in Borku known as Gaida, who have the same brand as the Kaitinga of northern Darfur; and a tradition recounted to me by Malik Muhamedain Adam Sebbi, till recently chief of Dar Zaghawa, who recognizes this community of origin of the Gaida and Kaitinga, states that the ancestor of the Kaitinga accompanied Ahmed al Ma'agūr, the ancestor of the Tungur, from the north, and obtained a position of authority under the Tungur.

Further support for the main argument is provided by the claim of the Tama sultans to be Hilālīn, although their Daju origin is generally recognised. I have heard their claim supported by the statement that all sultans are Hilālīn.

to ensure the adoption of the tale by all Tungur, once it had been accepted by the court in Darfur.

It would lead beyond the scope of this history to reconcile the theory that the Tungur of Darfur sprang from the Tumagera of Tibesti with the traditions recorded by Barth and Carbou that they came once from Dongola, or at one time lived on the banks of the Nile. But this Nubian connection of the Tungur, which MacMichael favoured, may date back a thousand years earlier than he thought. It is not improbable that when Meroe, about the fourth century, was sacked by Axum, the fringes of the country between Meroe and Tibesti were more inhabited than they are to-day. We have seen that this desert may have been still drying up and expelling its population in the time of Leo Africanus. If this were the case, is it so very impossible that the royal family of Cush, or some branch of it, after ruling for a period of over a thousand years on the Nile, first at Napata and then at Meroe, may have taken refuge in Tibesti? Even under present day conditions, it would not be impossible. The Tumagera must have been at one time looked on as remarkably royal in nature for them to have provided princes for Tibesti, Kawar, Munio, and Mandara,¹ also perhaps Demagherim, if not Darfur and Wadai as well. Such royalty is bequeathed to men only by descent from the ancient gods. Such a theory would explain the origin of the name or title *Show* for the early ruler of Darfur, for at Meroe the king was identified with Show, who was looked on as a sun god, a later form of Shu, the atmosphere.²

We have already noted the similarity between the Meroitic and Zaghawa words for 'king,' and their probable connection with the Tungur name Kirāti. We have seen too that the later dynasty, the Fur Keira, claim the same descent from Ahmad al Ma'gūr as do the Tungur. It is indeed not improbable that the name Keira derives, as well as that of the Kirati, from the Meroitic word for 'king' (*qere*)³. From Meroe also comes the idea of the divinity of the early Darfur kings (see ch. 7), an idea quite foreign to the Tuareg.

¹ In the recently compiled chronicle of the Tumagera chiefs of Mandara, their traditional move from the east via Darfur, Wara in the land of Wadai, and Bagirmi is related. *Sudanese Memoirs*, II:96. And in his introduction to C. K. Meek, *A Sudanese Kingdom*, p. xxx, Palmer states that these Mandara chiefs claim descent from noble Tuareg.

² F. L. Griffith in *Meroe*, p. 66. When the property marks found on metal vessels etc. in the pyramids at Meroe are published by Dows Dunham in a forthcoming volume of his *Royal Cemeteries of Kush*, it may be found that they are not unconnected with the brands of the Tungur.

³ F. L. Griffith, in *Meroe*, p. 66.

The relation between the Tungur, if they were Tumagera from Tibesti, and the Zaghawa of northern Darfur, who claim that their rulers came from Bornu, and who must have some connection with the Zaghawa who were in Kanem in the ninth and succeeding centuries, is not yet clear. There may be a clue to a solution of the problem in the fact that the area of the senior chief of these Zaghawa has been for some time known as Dar Tuar. It is now said to be named after a small hill for no particular reason, but it is perhaps significant that Dar Tuar contains all the five sections of Zaghawa that claim descent from Muhammad al Bornawi, and that the Tumagera are known to the Kanembu as Tumāri, and to the Kanuri as Tuari.¹ We have seen that the Tungur still acknowledge their affinity with the Biriara of Ennedi. Dar Tuar forms the chief part of the area between Ennedi and the present spheres of the Tungur of northern and central Darfur. It is thus not impossible that the Tungur may at one time have inhabited Dar Tuar; and if they are Tumagera they may have given their name to it. Further a folk-memory of this 'connection' may survive in the tradition narrated in 1936 by the chief of Dar Tuar that when Ahmad al Ma'gūr was left behind wounded by his brother, his sister Al Dōma (an unusual name—is it too an echo of Tumagera—Tumari—Tuar?) stayed behind with him and eventually became the mother of Tuar, *i.e.*, of all the five sections of Zaghawa who claim Bornu descent, being given in marriage by the sultan to Haj 'Ali of Bornu, a learned man who had been on the pilgrimage, and who was put in charge of Dar Zaghawa after the flight of the Mira chief. But whatever may be the exact relationship between the Tungur and the Zaghawa, there seems little reasonable doubt that the Tungur dynasty were Berbers, and further that they were not improbably descendants of that far-flung royal family, the Tumagera of Tibesti.
































CHAPTER VI.

The Evidence of the Brands Used by non-Arab Tribes in Darfur.

Although no historical writings of any age survive in Darfur, letters of a bygone alphabet are still there for us to see every time we see a camel belonging to a Darfur tribe of non-Arab origin. It is no new theory that the brands with which the tribes of North Africa mark their animals are

¹ Informant Muhammad Abd al Rasul of the Dalatoa, from Mao, Kanem. Cp. Nachtigal, I. 403, where the name of Wadi Domar is said to be shortened by the southern Tibu to Doar.

KEY TO CHAPTER VI.

- | | |
|---|--|
| (1)  R | (18)  |
| (2)  R (later form) | (19)  |
| (3)  T | (20)  |
| (4)  or  D | (21)  |
| (5)  D | (22)  |
| (6)  G | (23)  |
| (7)  B | (24)  |
| (8)  L | (25)  |
| (9)  J | (26)  |
| (10)   F | (27)  |
| (11)  or  | (28)  |
| (12)   | (29)  |
| (13) \| | (30)  |
| (14) \| \| | (31)  |
| (15) \|\| | (32)  |
| (16)  | (33)  |
| (17)  | |

in some cases derived from letters of the Berber alphabet.¹ Anyone who knows these letters cannot fail to be struck by the resemblance between them and many of the brands in common use in Darfur. While stationed at El Fasher in 1932-7, I collected as many as possible of the brands used by non-Arab tribes in the province, and just outside its borders. I amassed a total of 150 brands, and was surprised to find that, apart from ten brands, eight of which have probably always represented the swords and throwing-knives after which they are named, the remaining 140 may all possibly be derived from eight or nine of the ten consonants of the Berber alphabet given by Rinn as basic, (See numbers (1) to (10) on Key), while (11) in one or other form may occur among the Bisharin and Ababda of the eastern Sudan, who almost certainly have kinsmen among the Bedayat and kindred peoples on the northwest borders of Darfur. It is not suggested that in every case the similarity must mean that the brand is derived from the letter it resembles ; but the similarities are much too numerous to be purely fortuitous ; and a majority of these brands may with some degree of probability, and in many cases with certainty, be attributed to Berber letters.

Here is another indication that some form of civilization or organization was introduced into Darfur by the Berbers. The nearest survival of the Berber script to-day is among the Tuareg, whose home is in the semi-desert country of Air, northwest of Lake Chad. The Tuareg have frequently during the period under review exercised considerable pressure on the peoples of Lake Chad, and when embroiled by the Sennussi in an attempt to resist the French occupation of Wadai, a small party of them were cut off from their homes and settled temporarily in Darfur. The time when Berber letters were generally adopted as tribal brands must, however, date back to a period when the rulers of the country used the Berber script, and Arabic had not yet come in.

Can we obtain from a comparative study of these brands any other light on the history of Darfur ? The conservatism with regard to brands that still exists makes it certain that they have never in the past been casually altered. When sections of tribes have split off from the parent stock to form new units, they will have jealously kept their old brand, although they may have made minor alterations to it. This study should, therefore, at any rate illuminate the relationships, if not the origin, of the tribes that have played the most important parts in the history of Darfur.

¹ Randall MacIver, *Libyan Notes*, p. 75; Harding King, *Mysteries of the Libyan Desert*, pp. 24, 25, 330-4 ; and F. R. Rodd, *People of the Veil*, pp. 201, 266-271. See also Rinn, *Origines Berberes* ; Oric Bates, *Eastern Libyans*, pp. 84-90, and H. R. Palmer in *Journal of the African Society*, xxxi, p. 293.

For instance we may find some confirmation of the tradition that the royal families of the Daju and the Tāma are connected in the fact that they alone use the sword as a brand.

I found 18 brands composed of, or containing the figure(1) and another ten of which (2) was the chief component. These brands include (see Key):

(1) Tungur Kirati.

(12) Tungur Wara.

(1) used by a small colony of people in southern Darfur who still call themselves Tōra.

(13) Mīma of eastern Darfur (the royal family).

(1) " " " " (the rest of the tribe).

(14) Dāju Togoingi of Dar Sila.

Dāju of southern Darfur (the royal family).

(2) Meidob (the personal brand of the chief).

Altogether of these twenty-eight brands, no less than fifteen belong to different sections of the Daju. (1) or (2), the common basis of these brands, is now usually explained by the tribes who use them as a drum, and the reason for their frequent occurrence seems clear. The drum in Darfur has been since pre-Arab days the chief outward and visible sign of authority. The copper war drums (*nahas*) were the prerogative of the sultan, the symbol of his sovereignty, comparable to the crown in England; and lesser chiefs were allowed by the sultan to have their smaller war-drums, of which, no doubt, they were very proud and which they jealously kept to themselves.¹ Hence the chiefs and their relations would naturally adopt a brand representing their authority, and it is not unlikely that some brands which belong to ruling sections and are now said to represent drums, did arise in this manner. But a square is not the natural way of representing a drum, and the brand (1) seems to be the older form, being characteristic of the Daju, Tungur and Mima, all according to tradition early rulers in Darfur, and all probably of Berber origin. In Berber (*vide* Rinn, *Origines Berberes* p. p. 17 ff), among the meanings of (1) are 'origin', 'to be old' and 'top, summit', so that to a literate Berber (1) would appear an appropriate mark for a chief. In any case (1) was early a royal brand in Darfur, and it is easy to see how, especially if it took the form of (2), it would be thought to represent the drum of the sultan or chief. Brands

¹ These smaller chiefs were therefore called 'drums' after the sign of their rank. Hence the common title *shartai* for such a chief in Darfur, for *churti* means 'drum' in the Daju language. A *shartai* and a drum are both called *kisu* in Fur. Compare *tamberi*, the Tuareg drum chief or war chieftain: see Barth, *Travels*, I. 356, II. 44, etc. Cf. also Nachtigal, *Sahara und Sudan*, III. 320, apropos of the smaller tributary sultans.

frequently bear names which indicate mistaken ideas about their real origin, as for example, those which are now called in Darfur 'reaping knife,' 'bed,' 'donkey's stomach,' 'crow's feet' or 'woman's pot,' and which can all be derived with more or less confidence from Berber letters. It is in any case clearly of historical importance that the same brand (1) is used by Kirati, the royal section of the Tungur, the Mima, many sections of the Daju, and a small section of people who still call themselves Tora, the name under which the Fur of Jebel Marra appear to include both the Daju and the Tungur, as the light-coloured rulers who introduced an extensive civilisation to which the massive stone buildings, cultivation terraces and stone-lined wells still bear witness today.

With this group of brands containing (1) or (2) is to be compared a significant group of seven brands in which a semi-circle or crescent in varying positions is the characteristic common element: viz:—

- | | |
|--|--|
| (16) <i>Bedayat Genigagera.</i>
(N. Darfur) | This section claims descent from Bukur a Kināni, and they now explain their brand as the crescent (<i>hilal</i>) on the flag carried by their ancestor as the standard bearer of the Beni Ummaya khalifa Mohamed Wad el Soda (!), who is said to have followed the Arabs to Darfur and broken the power of the Zaghawa Mira. |
| (17) <i>Meidob Kinana.</i>
(N. Darfur) | We have already seen the chiefs brand. All the rest of the tribe except the Kinana use the brand — —. |
| (18) <i>Birgid Hilali</i>
(S. Darfur) | |
| (19) <i>Daju</i>
(Dar Sila) | used by the descendants of the 'Kināna' dynasty, who were sultans of Dar Sila before the present Guduratki dynasty. |
| (20) <i>Daju Roshungi</i>
(Dar Sila) | This section claim to be Hilāliin on the mother's side. |
| (21) <i>Daju Turuj-ningi</i>
(S. Darfur) | who explain their brand as the drum of the Kinana with the club indicating slave origin. |
| (22) <i>Tungur Dowlunga</i> | the family of the <i>shartai</i> of Dar Hamra. |

In most of them this semi-circle is consciously or subconsciously looked on as the crescent moon, Arabic *hilal*, although in some of them it is called a drum, as in the brand of the comparatively recently created chieftainship the Tungur Dowlunga of Kutum, where it is described as the *dingar* or small war drum with two sticks, *i.e.*, it is looked on as the counterpart of (1), the royal drum of the Tungur Kirāti of J. Hereiz. But in the case of the Tungur Dowlunga, an entity no doubt created subsequent to the propagation of the Tungur claim to descent from the Bani Hilal, the brand was probably from the first looked on as a crescent (*hilal*). Indeed these seven brands may all be post-Islamic. Apart from the fact that both the appearance and the history of these peoples cast doubt on

the justice of their claim to Arab descent, it is unlikely that two Arab tribes of different origin should have used the same brand. On the other hand the tribal sections that use these brands either still rule or have held rule in the past, and those that use the *hilal* and claim to be of Kinana descent probably held sway before the arrival of the Arabs, and it is not unlikely that they used to give themselves the Berber name of *ilala*, 'nobles,' so that when they became converted to Islam and felt constrained to claim Arab descent, they naturally first called themselves Hilāl or Bani Hilal, subsequently varying this to Kināna, through Benāna¹, from ignorance or when political necessity forced them to emphasize their different origin as against that of the Tungur dynasty who had come to be generally regarded as Bani Hilal. The fact that Kināna were the tribe of the Prophet himself must have provided special stimulus for the change. In this case, however, the brand which had already become established as a crescent, would not have been changed.

The Berber letter(3) = T is no doubt responsible for most of the reports of the survival in Darfur of Christian practices, such as the use of the cross,² from which it has been deduced that Darfur was once under the influence of the Christian kingdom of Dongola, or that the Tungur, when they first reached Darfur, professed some form of Christianity. Although I was on the look out for years, I found no evidence for this. It is possible that the use of the sign of the cross may have reached Jebel Meidob from the Nile Valley, as a mere superstitious usage only; but it is probable that its use by the Tungur of Dar Furnung reported by MacMichael was the use of this tribal brand. At any rate at a rain ceremony made by the *ahl al 'awaid* of the Tungur Wāra at J. Masa, the female performers during the ceremony made paste out of flour and water, and with it smeared several rocks near the mouth of the well with their brand (12). I took particular care to note that it was this brand and not a cross.

The simple brand(3) is used by the Berti Simiat and the Sēnyar already mentioned. Its use by the Kirwa section of the Tungur in Northern Darfur is also reported by MacMichael.³ In a slightly altered form it is used by the Zaghawa Mira whom we have also mentioned before.

With the addition of (4) at the base of each ear, it is used by both the Zaghawa Kobe and Kabga of north-western Darfur.

¹ MacMichael, *Tribes of Northern & Central Kordofan*, p. 91.

² *Sudan Notes and Records* III, pp. 31, 32, 224, 226 f., and XV, p. 273.

³ *History*, I, p. 71.

Apart from the Tungur Kirwa, whose use of the brand it has been impossible to confirm, the only element common to all the users of this brand seems to be the fact that they have had, or may have had, some connection with the Daju. We have seen that the Berti Simiat may be the descendants of the serf subjects of the Daju of Simia, and that the Senyar are an offshoot from them. The traditional connection between the Zaghawa Kobe and the Zaghawa Kabga is confirmed by the fact that they have the same brand. Either section is occasionally called the earliest or original Zaghawa. We have already mentioned a tradition that the Kobe or their rulers are of Daju origin, and another tradition that the founder of the Kobe dynasty secured the *nahas* of the Mira ruler when he lost the control of all Dar Zaghawa. The fact that the Mira brand is the same as that of the Kobe, apart from a slight modification, and that the Mira of Anka have a tradition that they once lived in Dar Kobe, thus provides some confirmation for the suspicion that the Mira may have a Daju origin. Further, the common tale to account for the move of the Daju from Darfur to Dar Sila, that 'Omar Kassi-Furok, their last independent sultan in Darfur, was so presumptuous that he would not content himself with riding a horse, and insisted on riding an antelope, which 'carted' him from Darfur to Dar Sila, is also told with the necessary alteration of a certain sultan Terninga, one of the descendants of Ahmad al Kabgawi, the legendary founder of the Zaghawa Kabga. If the Daju connection is thereby sufficiently established, the support given by the distribution of this brand to the theory that the domination of Dar Zaghawa by the Mira represents a Daju domination is of historical importance.

The brands (4), alternative forms of the Berber letter 'D,' either by themselves or combined with one or more strokes, usually two vertical strokes which form the Berber letter L (8), are chiefly confined to the Bedayat and Kaga of western Kordofan. This points to a connection between the Bedayat and the Kaga, which is further supported by the fact that the Meidob Shelkōta still recognize their relationship to some of the Kaga and have a tradition of a migration of large numbers of their people to Dar Bedayat.

The fact too that (23) the brand of the Aulad Dowri, one of the three chief sections of the Zaghawa of Dar Tuar who claim Bornu descent, is of similar form points to the fact that they, like all the other inhabitants of Dar Zaghawa, may be Bedayat in origin ; and that their connection with Bornu, whatever it is, may be rather political than physical.

The Berber letter D (5) is mainly confined to the Berti ; and possibly stands for their old name Dogā or Dogabu. The letter G (6) occurs in the brands of the Tama, three sections of Daju and two sections of Berti, thus

corroborating the Tama-Daju connection. The Berber letter B (7) is confined to the Tungur and its Tuareg form (1) to three sections of Daju. The letter L (8) in its simple form is confined to the Daju and to the Berti, who may have been their serfs.

The most complicated group of brands comprises those composed of the sign (24), commonly known as the 'crow's foot,' but which in view of the preponderance of the Berber letters among the other non-Arab brands of the country may be connected with late Berber Z (25), which occurs in its simple form as the brand of an obscure section of the Berti, the Shillingāto of the Central District.

The form (24) is used by Keira at Dobo, southwest of El Fasher, and appears to be combined in a reduplicated form with (4), the brand usually associated with the Bedayat, in (26) the brand used by relatives of the Fur sultans. To this brand is added the royal drums, in the brand (27) used by the Fur sultan himself.

Some justification for attributing part of this brand to the (4) of the Bedayat is that it is used by the Bedayat Biriara, with whom as we have seen, the Tungur of J. Hereiz maintain relations, and in this connection it is important to remember that the Keira dynasty bases its claim to the throne on its relationship to the Tungur. (Actually (28) as a Tungur brand is reported by MacMichael, though it has not been possible to confirm its existence.)

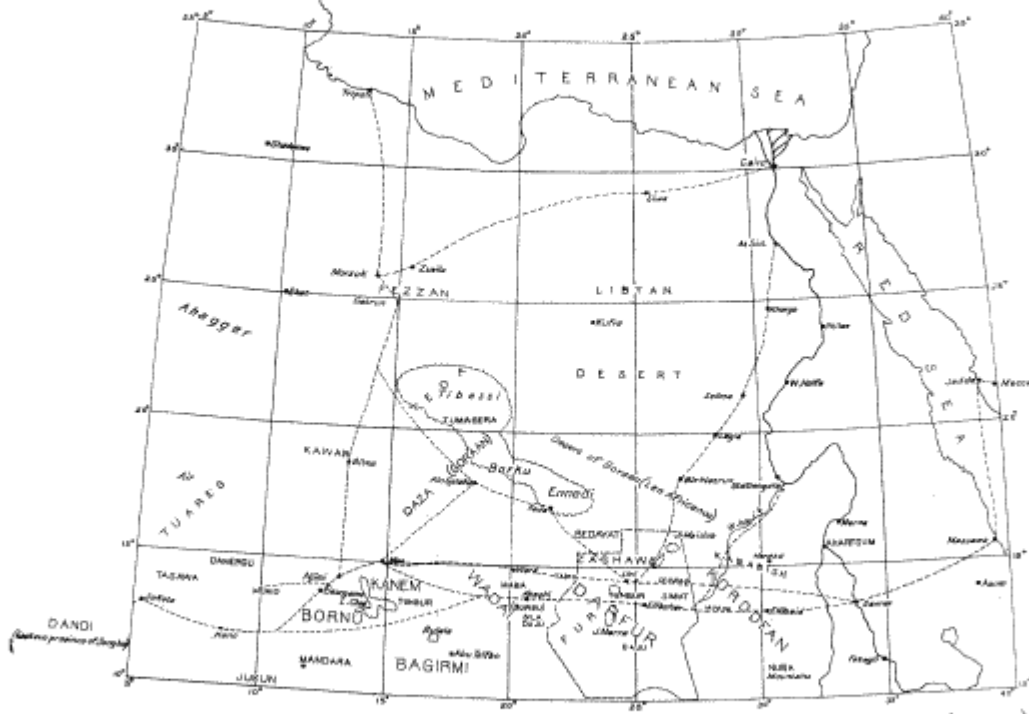
The basic element of (29), the brand of the Konjāra, whom we have seen reason to believe are distant relations of the royal Keira, is clearly (25), which occurs in the brand of the Tungur of Dor in Northern Darfur, and in (30) the brand of the Birgid Tudugi who claim to be Hilaliin in origin, *i.e.*, Keira or Tungur.

Among the Zaghawa of Northern Darfur, (24) is the brand of the Lila section, and it appears to be part of the make-up of the two chief sections of Tuar that claim descent from Mohammad al Bornawi, *i.e.*, the Agaba (31) and the Aulad Dikein (32).

The two straight strokes which seem to be combined with these last two brands, are as we have seen confined in its simple form to the Daju and Berti; the origin of these two Zaghawa sections that claim connection with Bornu, and so perhaps with Kanem the original home of the Zaghawa, must be of historical importance.

The brand of the Gorān Gaida and the Kaitinga of northern Darfur (33) seems to be a combination of (1) and (24), and thus to indicate a cross between Tungur, Daju or Mima (represented by (1)) and ? Tungur or Keira represented by (24). Now the Kaitinga are said to be descended from

MAP SHOWING COUNTRIES THAT MAY HAVE INFLUENCED DARFUR (200-1700 A.D.)



Scale: 1/721,600 or 1/85 miles 1 inch
 Miles 0 100 200 300 400 500
 Inches 0 100 200 300 400 500

Gaida, who were friends of the Tungur and accompanied them from the north, and from their geographical position we should expect them to be a blend of Zaghawa and Tungur.

CHAPTER VII.

The Early Sultans Were Divine Kings.

Yakut (c. 1200) ¹ quotes Al Muhallabi (903-963), as saying : " The Zaghawa are two cities, one called Mānān and the other Tarāzaki (ترازكي). They are in the first clime; and their latitude is 21. The kingdom of the Zaghawa is said to be a great kingdom among the kings of the Sudan. On their eastern boundary is the kingdom of the Nuba who are above Upper Egypt. Between them is a distance of 10 days' journey. They are many tribes. The length of their land is 15 days' journey through habitations and cultivations all the way. Their houses are all of gypsum and also the castle of their king. They respect and worship him to the neglect of Allah the most High ; and they falsely imagine that he does not eat food. His food is taken into his house secretly, and if anyone of his subjects happens to meet the camels carrying it he is immediately killed on the spot. He has absolute power over his subjects and takes what he will of their belongings. Their cattle are goats and cows and camels and horses. Dura chiefly is cultivated in their land, and beans, also wheat. Most of the ordinary people are naked covering themselves with skins. They spend their time cultivating and looking after their cattle; and their religion is the worship of their kings, believing that it is they who bring life and death and sickness and health. From the towns of Bilma and Qusba in the land of Kawar it lies south east."

This important passage appears to refer to the whole area between Darfur (or perhaps Kordofan) and the eastern shores of Lake Chad. We are told that the road through it lay through habitations and cultivations all the way, and apparently that its boundary with Nubia was at a distance of ten days' journey from Dongola. The distances given are inadequate, except for a courier using relays of animals. A caravan travelling from old Dongola by that natural highway, the Wadi Melik, would in ten days get near the site of Zankor, a red brick ruin of uncertain date which must have at some time controlled the trade between Darfur and Dongola along that route. We shall see in the last chapter that Kanem at about this time or a

¹ *Geographisches Worterbuch*. Leipzig 1869. II. 932.

little later claimed that its dominion reached Adu in Sai Island in the heart of Nubia, although there is no evidence that the kingdom of Nubia controlled any territory west of the Nile. To the immediate west of Dongola the country is and probably has been for centuries practically desert, so that the kingdom of Nubia, which was never very powerful, probably did not interest itself in trying to control countries that lay beyond the desert. It probably looked on it as a natural frontier and contented itself with trading with some of the countries beyond it, as for example by this very important route, the Wadi Melik.

Two cities of the Zaghawa are mentioned, Mānān and Tarāzaki. The latter, which sounds like a corrupt reading, may possibly indicate Zankor. Mānān or Matan is frequently mentioned in the medieval Arab writers in association with Kanem, and was perhaps between Njimi and Bilma. The position south-east of Bilma given by Muhallabi to the land of the Zaghawa appears to indicate Kanem rather than Darfur; and the impression given is that his informants were probably two merchants, one who had visited the Zaghawa country from Nubia *via* the Wadi Melik, and the other by the great road from Fezzan *via* Kawar (Bilma). There is a discrepancy between Muhallabi and Yakūbi (891 A.D.), who writes:—

“The Sudanese of the west have divided up the country with its many kingdoms. The first kingdom is that of the Zaghawa who frequent a country called Kanem. Their habitations are merely huts made of corn stalks: They have no kings of cities. Their king is called Kakara. Among the Zaghawa is a race called Hudin, who have a king that is a Zaghawi. Then there is the kingdom called Malal which is at enmity with the ruler of Kanem. Then there is the kingdom of Habash (Hausa) to which belongs a city called Chibīr (? Gobir).”¹

There is little doubt that Yakubi's information as to the kind of houses usual in this area is the more accurate. Circular huts made of dura stalks still prevail in this area to-day. Mud buildings have never been common in Darfur, though numerous in the capital of Wadai. They are unsuitable to the climate, as they are liable to collapse during the rainy season. It is not quite clear exactly what Muhallabi means by جصوص but some form of mud construction, possibly pisé, is indicated.

The importance, however, of this passage from Muhallabi is that it shows that in our area at the beginning of our period and the centuries immediately preceding it, the kingdom of the Zaghawa (?Kanem) was a

¹ Translated by Palmer *Sudanese Memoirs* II 20 from the Houtsman text (Leyned 1883),

divine monarchy ; and there can be no doubt whatever from various ceremonies and institutions connected with the Darfur sultanate that survived down to last century that the earliest sultans of Darfur were typical divine kings. The MS obtained by Nachtigal from the Daju prince from Dar Sila definitely admitted that the first six Daju kings who had reigned in J. Marra had been pagans. We have seen that the barrows at the summit of the highest peak at the southern end of the Marra range may be the tombs of these pagan Daju sultans ; and it is quite clear, from the way in which the still almost pagan Fur of western Darfur make the toilsome ascent in pilgrimage to these tombs, and from the way they behave when they reach the tombs that, in the words of Muhallabi " they believe that it is they who bring life and death and sickness and health." These Fur still to-day " spend their time cultivating and looking after their cattle."

Further evidence that the sultan of Darfur was regarded as the source of fertility is provided by the ceremony with which the sowing season was opened by the sultan. This custom was first reported by Browne,¹ who remarked that the same custom was said to obtain in Bornu and in other countries in the same part of the world. He commented that it called to mind a practice of the Egyptian kings recorded by Herodotus ; and in actual fact it goes back to late predynastic times, being represented on the great mace head of Hierakonpolis.² Browne is supported by Tunisi³ who states that after the rains at the solemn festival of the sowing, the sultan goes forth in great pomp, escorted by more than a hundred young women, the most favoured of his harem, in their richest attire. They carry on their heads baskets of choice food, and walk behind the sultan's horse with the bodyguard and musicians. They sing and play as they go, and when they reach their destination, the sultan dismounts, a slave turns up the ground with a hoe, and the sultan casts different kinds of seeds in the holes. These are the first seeds sown in that part of the country where the sultan is. The importance of this festival to the conservative rustic Fur is shown in the fact that after the Egyptian occupation put an end to the sultanate, it was continued by the chiefs of all the Fur districts ; as is reported by Felkin, who gives a full account of the ceremony.⁴ This custom is still kept up by the Fur *shartai* of western Darfur.

¹ *Travels* p. (283-4).

² Petrie, *Hierakonpolis* 19-10.

³ *Darfur*, p. 169.

⁴ Felkin. *Notes on the For tribe of Central Africa*. Proceedings of Royal Society of Edinburgh 1885, pp. 225, 226.

Down to quite recent times the Fur sultans pretended that they did not eat the food of ordinary mortals. As late as 1844 Pallme, a Bohemian merchant, reported of Abu Medina, one of the younger brothers of sultan Muhammad Fadl, who was living in exile at El Obeid :

"I have frequently dined at his table, and when I, on one of these occasions, observed no bread, and asked the reason, he answered : bread is only for servants and slaves ; but that it had never been a custom of the sultans of Darfour to eat bread"¹. In Wadai the sultan ate nothing made of millet, the ordinary food of the people, and only ate wheat or rice (rareties). The water which he drank was brought to the palace in pots wrapped in cloth ; and the women who carried them from the well to the palace were escorted by three eunuchs, and woe betide those who met them on the way who did not kneel and avert their gaze, until the water had passed.² Nachtigal³ also reports a similar custom as observed by the kings of Bagirmi, where it was attributed to the king 'Abdallah (1568-1608), who had first established Islam as the state religion of Bagirmi. It was said that he had introduced the custom in order to show how different a king was from the people, and how pure externally and internally a monarch must be ; but it is not a Muslim custom, and it is reasonable to suppose that in Bagirmi too it is a survival of the custom reported by Al Muhallabi.

Browne reported of Sultan 'Abd al Rahman in Darfur :—

"When he passes, all the spectators are obliged to appear barefooted, and commonly to kneel. His subjects bow to the earth, but this compliance is not expected from foreigners. Even the Meleks, when they approach the throne, creep on their hands and knees".⁴ This custom was kept up down to the reign of 'Ali Dinar, which only came to an end in 1916.⁵

Similarly the custom of appearing bare to the waist, sometimes modified to baring one shoulder, in the presence of the sultan, which is widespread from Abyssinia to Lake Chad and beyond as far as Benin, is no doubt a tribute to the sultan's divinity.⁶ In Bagirmi,⁷ as with the Fung⁸ it was the left shoulder that was bared. In Wadai the ceremony was enforced in its

¹ Ignatius Pallme. *Travels in Kordofan*. 1844. p. 354.

² Nachtigal. *Sahara und Sudan* II. 225-6.

³ *Sahara und Sudan* II 698, 699.

⁴ Browne' *Travels in Africa*. p. 214.

⁵ A. J. Arkell in *Sudan Notes and Records*. 5. 130.

⁶ See Sir J. G. Frazer. *Golden Bough*, abridged edition, p. 203.

⁷ Barth III. p. 455. Nachtigal S. & S. II 618, 695, 699, however, says they bared the body to the waist.

⁸ A. J. Arkell in *S.N. & R.* Vol. XV. pp. 163 and 207 (also plate 1),

entirety in the time of Tunisi¹. In Darfur however by the end of the eighteenth century the custom had been modified to the extent that it was only the *malhaj*, a muslin or silk shawl which could be worn as a turban, but was usually worn by the more wealthy Fur round the neck with the ends thrown over the back, or tied round the waist with the ends brought cross-wise over the shoulders and fastened in the belt so formed, which could not be so worn in the presence of the sultan. It had to be loosened from the shoulders and worn simply girded round the waist.²

A native chronicle of Wadai, of which a passage has been translated by Sir Richmond Palmer³, contains the following:- 'The inhabitants of Wadai are in origin a people of Nubia . . . Some take one "idol," others another, disregarding God. They worshipped their kings, saluting them in a recumbent posture as does he who prays to God. They also bared their shoulders to them according to the practice in the Hadith of 'Abaya ibn Rufayi 'where he says that the Prophet . . . when he performed the *tawaf* first bared one shoulder and pushed the end of his turban on to his left shoulder ; then tied both ends behind leaving both shoulders bare. The great ones of Wadai borrowed this observance of the "Sunna" from Mecca and adopted it, and made it obligatory on their slaves and subjects.⁴

'Among the hills in the neighbourhood of Wara was a height called Jebel Thurayya (Pleiades) on the summit of which was a threshing floor. Near this was a rock where the heathen kings of the Tungur of old used to build a grass house, and made for it seven "stations," as for instance the station of Thurayya (Pleiades). When they made a sultan their chiefs took him up the hill to this place and made him stay in the "Seven Stations," and his followers encamped round him on the hill. Then they seized the people of the village at its foot, boys and girls, and sacrificed as many as they thought fit—one each day. They also sacrificed a dark-coloured ox, and from the flesh of the ox and that of the children made a pâté from which the sultan-elect ate, what he left being thrown on the rock. Then a huge snake came out. Thus they made food for the sultan for seven days, and they said that any sultan who did not go through this ceremony would have no real power. When 'Abd al Kerim (the founder of the latest dynasty

¹ *Ouaday*, p. 374. By Nachtigal's time this custom had been modified to baring the right shoulder only. See *S. & S.* III 55, and 226.

² Tunisi. *Darfur*, p. 205.

³ *Sudanese Memoirs* II, pp. 24-28.

⁴ This explanation is no doubt an attempt to justify an obviously pagan custom before Muslims, but its observance by the pagans in the Nuba Mountains and Benin is sufficient proof that the custom is not Islamic.

in Wadai) saw this house, he cleared it up, and made a town
 When 'Abd al Kerīm died there was a dispute about the succession
 The people of Wadai made Harut king, because he was their brother (the younger son born in Wadai), and took him up the rock to the place of pagan worship As regards the ancestral custom of making kings on the rock, they have never broken with it altogether, for when Harut's affair was over, Satan suggested to his brother that if he fulfilled the old rites of the rock as practised by the ancient kings, his kingdom would endure.'

Such ceremonies, in which a black bull is sacrificed, and an offering is believed to be eaten by a sacred snake, are common in Darfur. For instance the rites performed at the accession of the late Fur *shartai* of Kerne in W. Darfur, were (1936) described thus by the *shartai*, who had not performed them himself :—

'The ceremony is performed at Gili on a small ridge on which are the remains of a stone building surrounding a rock. A black bull followed by the *shartai* with his people and horses, is led to a large *gemmeiza* tree, under which a shot is fired. The bull is then slaughtered between two other trees, and the *shartai*, his people and horses jump over the carcass. They then approach the "place of customs" from the east, and go round the north side, and enter from the west. There they enter, and the hereditary officiant places water, flour and a little of the meat, and sprinkles water on the ruins, the people and the animals of the *shartai*. Next day the offerings will have vanished, and it is believed that they are taken by short white snakes with human eyes.'

Nachtigal¹ also states that as long as the sultan lived at Wara he had to spend seven days on Jebel Thurayya, where the royal drums were kept, and there sacrifice 100 camels, 100 cattle and 100 sheep in honour of his ancestors at the royal burial places. Even in Abeshr the sultan remained for seven days in his house after the performance of the accession ceremonies, which consisted in seating him on a carpet on a high platform made of mud (*tirja*) and investing him with the royal insignia.

The following account of the rites performed at the accession of the sultan of the Zaghawa Kobe (Kubura) of N.W. Darfur was given (1936) by a number of Zaghawa informants from the Mira and other sections :—

The Zaghawa Kobe are said to have come from Ennedi about eight generations ago, and to have displaced the Mira, who till then had occupied the land together with their serfs the Zaghawa Turéi². Their sacred hill was

¹ *Sahara und Sudan* III. 227.

² The aborigines—compare the name Turuj, which connotes a servile origin and is associated with the Daju in Kordofan and S. Darfur.

Kobei Gwardi. At the accession of a Kobesultan, a pregnant camel that has never foaled before, is taken to the foot of the hill, where a man from a Mira family which has the hereditary charge of these rites, pours water on it and then hits it with his stick. The camel then without further ado proceeds to the top of the hill, which is difficult to ascend. There the officiant stabs the camel with a spear, and the sultan puts his hand and feet in the blood. He then lies on a bed; and the Mira officiant pours water all over the sultan, which falls on the Turei man below. The sultan then puts on new clothes and gives new clothes to the Mira and Turei men. The Mira, who now live round Anka in N.E. Darfur, have a sacred rock which is said to have been brought from Kobei Gwardi, and another hill which they call Kobei Gwardi. The Mira are said by the Agaba *malik* of Dar Tuar to have been the original owners of Dar Tuar, and when the rites connected with the *nahas* (the copper drums of the Agaba *malik*) are performed, the head of the Mira sits on the bed with the *malik* of Dar Tuar. The late Hisabo Tor Jokeil is said so to have sat with both *malik* Muhammedain Adam Sebbi and his father.

With this it is interesting to compare a note by Sir Richmond Palmer on the king lists of Katsina in Nigeria :—¹

“The successors of Korau reigned from about 1260 A.D., but the (Diggera) Durbawa remained electors to the kingship, and were repositories of everything connected with magic. The ruling Sarki was in early times not allowed to die of old age or ill health, but was strangled by the official called Karyagiwa. The new king was elected either by some rite with the sacred snake or by throwing a spear into the ground. If the spear remained upright when the name of the candidate was called, the nomination was confirmed. The new king was then put on a bed and a black ox was slaughtered above him at the Kan-Giwa (centre of the town) so that he was drenched in its blood. The skin of this ox was then taken to the palace and the deceased chief put inside it and dragged on the ground to the place of burial. The body was buried in an upright squatting position. After a while the Durbawa, it is said, lost their exclusive right of nomination, which became vested in three chiefs, Kaura, Galladima and Durubi.”

Now in Bornu, the privilege of choosing a successor from the sons of the deceased king, without regard to priority of birth, was conferred by the nation on *three* of the most distinguished men of the country.² Barth comments that Lucas did not make it clear whether they were courtiers or

¹ *Sudanese Memoirs*, III. 82.

² Information supplied to the traveller Lucas by a reliable Arab informant. *Proceedings of the African Association*. Vol. I, pp. 148 ff.

only private individuals, although the strict etiquette of the court of Bornu makes it probable that they were courtiers.¹ When they had made their choice, the three electors proceeded to the apartment of the sovereign elect, and conducted him in silence to the gloomy place in which the unburied corpse of his deceased father was deposited ; for till this whole ceremony had been gone through the deceased could not be interred. There, over the corpse of his deceased father, the newly elected king seems to have entered into some sort of undertaking to respect the ancient institutions and serve the good of the country. Lucas compared the rule of succession in Bornu with that in Katsina ; and Barth compared it with the ceremony performed at the accession of the head of Munio, who, as we have seen, belonged to the Tumagera :— “ Every newly elected Muniyoma, still at the present day, is in duty bound to remain for seven days in a cave hollowed out . . . in the rock behind the place of sepulchre of the former Muniyoma, in the ancient town of Gammasek, although it is quite deserted, and does not contain a living soul.”²

Tunisi informs us that until the accession of sultan ‘Abd al Rahman it had been the custom in Darfur for the sultan at his accession to remain for a week in his house, without doing any business, or giving any orders. He passed the time in ceremonies and festivals, and receiving visits. ‘Abd al-Rahman broke the custom, as not having the sanction of the Qoran.³ There appears little doubt that this custom of remaining at home and abstaining from business was a relic of an earlier time when the new sultan was kept in strict seclusion. Tunisi also mentions a similar custom to that obtaining in Bornu, whereby at sultan ‘Abd al Rahman’s death, the chief eunuch took the eldest son Muhammad Fadl, and invested him and seated him on the throne, which was in the room next to that in which the corpse lay. He then obtained oaths of allegiance from various important men, before allowing the sultan’s death to be announced.³

I was informed by four old men who had respectively held the posts of Qadi, Abo Gabbayin, Chamberlain and Secretary to the late Sultan ‘Ali Dinar that if there was time before the death of the sultan, the viceroys of the four provinces, Abo Dima, Abo Uma, Abo Tokonyawi and Abo Sheikh, the *shartais* of the western *dars* Fia and Kerne that were excluded from these provinces, the Abo Gabbayin and the Qadi would all assemble to choose the successor ; but if there was not time the Qadi and the Abo

¹ Barth. *Travels*. II 271.

² *Darfour*. p. 89.

³ *Darfour*. p. 122.

Gabbayin, who were resident at court, would consult with the four most important *umana*, the Abo Sarenga, Abo Dadinga, Abo Iringa and Abo Soming Dogola, who were also usually at court, and decide with them on a successor from among the sons of the deceased sultan. The sultan-elect would be summoned secretly to where the body of the sultan lay behind a curtain, and there he would hear for the first time of the death of his father, and be told that he had been chosen sultan, provided he swore to perform justice and respect the existing officers and not dismiss them.

It is important to notice the close parallel between the method of selecting and appointing the new sultan in Darfur and in Bornu, and that the old custom by which the sultan was kept in seclusion for seven days after his enthronement was common to the Tungur of Wadai, the sultans of Darfur and the Tumagiera of Munio. The accession rites mentioned above seem to have an underlying common pattern, or combination of patterns. The traditional Katsina rite suggests a connection with Meroe. It is much to be regretted that more details are not available of the method by which kings were selected and appointed at Meroe. Such details may have been recorded in the works of Agatharcides of Cnidus (2nd century B.C.) and Artemidorus of Ephesus (c. 100 B.C.) the authors quoted by both Strabo and Diodorus Siculus, but all that has survived is the following passage from the latter :—

“As for the customs of the Ethiopians, not a few of them are thought to differ greatly from those of the rest of mankind, this being especially true of those which concern the selection of their kings. The priests, for instance, first choose out the noblest men from their own number, and whichever one from this group the God may select, as he is borne about in a procession in accordance with a certain practice of theirs, him the multitude take for their king ; and straightway it both worships and honours him like a god, believing that the sovereignty has been entrusted to him by the divine providence. And the king who has been thus chosen both follows a regimen which has been fixed in accordance with the laws and performs all his other deeds in accordance with the ancestral custom, according neither favour nor punishment to anyone contrary to the usage which has been approved among them from the beginning.”¹ It is not improbable that the method by which the king was selected at Meroe from the royal priestly caste was that recorded from Katsina, in which as a candidate passed and his name was called, a spear was thrown into the ground, and he was elected whose spear remained sticking upright. Such a rite was

¹ Diodorus Siculus, III ch. 5 Loeb Trans.

capable of the manipulation that was essential if the priests were to secure the accession of the man they desired.

Further evidence that the early sultans of Darfur were typical divine kings is to be found in the fact that till 1916 the sultan usually gave audience behind a screen, and always veiled his face in public. Also there is ample evidence that a sacred fire was lit at his accession, and carefully tended throughout his reign, so that it is still commonly said in Darfur of a family that has lost a chieftainship: 'their fire is dead.' While there is no evidence that the Darfur sultan was ever killed ceremonially¹, human beings were at one time sacrificed at the annual ceremony of re-covering the royal copper drums with leather (see below).

In wearing the veil, making a public appearance on the two feast days, and giving audience behind a curtain, the sultans of Darfur and Bornu were following the example of the king of Kanem, of whom Qalqashandi (d.1418) quotes the *Masalik al Absar* as saying :

'Their king No one ever sees him except on the two festivals in the morning and evening. During the rest of the year no one speaks with him, not even an emir, except behind a screen.'² The sultans of Bornu continued this practice down to the nineteenth century, as is recorded by Denham, Clapperton and Oudney.³ Tunisi records that the sultan of Darfur in addition to his turban 'wraps up his face with a piece of white muslin which goes round his head several times, covering his mouth and nose first, and then his forehead, so that only his eyes can be seen. The Urundulung and the Kamni and the male children of the royal family also cover their face ; but in the palace only the sultan has his face concealed. The others are not allowed to veil their faces in his presence, except when they are riding with him.'⁴ At El Fasher Nachtigal found sultan Ibrahim sitting behind a curtain, behind which he was as a favour allowed to go and greet the sultan face to face.⁵ To the end of his reign, the late sultan 'Ali Dinar never appeared in public without his face veiled, and the sultan of Masalit continues that practice to-day.

¹ Abu Kheirat, one of the puppet sultans who arose in Jebel Marra during the Mahdia was unpopular with his subjects, because directly after his appointment there were two years of severe famine. (He was in fact actually killed by his rival 'Ali Dinar.).

² Cp. Ibn Bātuta, quoted by Barth. *Travels* II 270.

³ Denham, Clapperton & Oudney. *Discoveries in Africa* 1828. I. p. 233 and plate opposite p. 230.

⁴ *Darfur*, pp. 203, 204.

⁵ *Sahara und Sudan* III. p. 347.

The sacred fire was first reported from Darfur by Browne, as an old custom of the Daju 'of lighting a fire on the inauguration of their king, which was carefully kept burning till his death.'¹ Nachtigal however reports that in his time the chief eunuch, the Abo Sheikh, had to maintain in his house a sacred fire, which was only allowed to go out on the death of the sultan, and that a similar fire was kept burning in the sultan's palace.² There is no doubt that his statement is correct, although some attempt may have been made to keep secret this obviously non-Islamic custom.³

Browne also first reported a rumour that in Darfur at the ceremony connected with the re-covering with leather of the royal copper drums, which is described at length by Nachtigal, 'they put to death in the form of a sacrifice a young boy and girl.' Tunisi also reported this as a rumour, stating that many pretended that a young boy and a young girl, not yet arrived at puberty, were slaughtered, cut up and mixed with the meat of the oxen whose skins were used for covering the drums. The ceremonial eating of this meat by all sons of the sultan, *maliks* and other officers was compulsory, and it was believed that if anyone was unable to eat it, he was disloyal to the sultan. Tunisi added that he could get no confirmation of this rumour, for foreigners were not allowed at the ceremony.⁴ Nachtigal apparently believed from what he was told that in pagan times, *i.e.*, prior to the reign of Suliman Solong, a young girl was slaughtered and mixed up with the ingredients of the meal; and he also recorded that some people asserted that this custom had been followed down to the beginning of the nineteenth century.⁵ I was inclined to believe that the report was true, for there seemed no point in the meal as a test of loyalty to the sultan unless there was some powerful magic about it; and any doubts I may have had were removed when I discovered in 1937 that the Dāranga section of the Fur in south-eastern J. Marra is traditionally bound to provide the boy and girl sacrificed in the accession rites of the Abo Uma (or Umangawi),⁶ once Viceroy of the South, and that in 1936 the new Umangawi performed these rites, blood being taken from the arm of a boy and a girl from this section and mingled with the blood of a slaughtered sheep, and smeared on his face.

¹ *Travels*, p. 306.

² *Sahara und Sudan*, III, p. 424.

³ See Seligman, *Egypt and Negro Africa*, p. 53. There is a representation of the lighting of a fire at a *sed* festival of Amenhotep III at Sulb south of Wadi Halfa.

⁴ *Darfur*, p. 165.

⁵ *loc. cit.* III, p. 440.

⁶ The Meirenga section of the Fur, from whom the Abo Uma is appointed, claim descent from the Bani Hilal, and are therefore possibly Tungur in origin.

Seligman¹ quotes C. K. Meek as giving the best description of a typical West African divine king in his study of the Jukun. Among the Jukun the main duty of the king was to secure a successful harvest, so that he could control the rain and the weather, and if he became ill or was in any way unsuccessful he was secretly strangled. He was not a leader in war, and if in extremity he went to the field of battle, it was not to fight with material weapons, but shrouded from head to foot and grasping a sacred spear believed to confer invincibility. During his lifetime it was improper to imply that he had an ordinary human body. At the accession of the new king, he was invested with the regalia, and admonished to rule justly; after which there was a period of seclusion during which he learned to receive his food ritually and was bathed ceremonially. Later he was acclaimed by the people and formally entered the palace. Every detail of the above can be paralleled in Darfur, down to the sacred spears which formed part of the regalia, being known as *kor domi*, and kept in the *Bait al Nahas*. The only difference is that no evidence has survived that the sultans were ever ritually put to death, although we have seen that human sacrifice did take place at the 'leathering of the Drums,' and among the Jukun they took place at certain ceremonies for prolonging the king's life. Other Jukun institutions which all find a parallel in Darfur may be quoted from *A Sudanese Kingdom*. The Jukun king does not appear in public, he has fans and a sacred stool, he initiates the cultivation season, he is fed by young boys (compare the *tuweirat* or 'young birds' of Darfur); people appear bare to the waist in his presence, and clap their hands in salutation² (as they do in Dar Masalit to-day). We have indeed striking confirmation here, and in the parallels between the Jukun and the Daju quoted in previous chapters, of the Jukun tradition that they came originally from the region of Kordofan.³ In fact not only are we justified in concluding that the early Daju sultans of Darfur were divine kings of the Jukun type, the latter having preserved the early pattern comparatively undamaged by contact with Islam; but also that further investigation may show that the Jukun kings are the descendants of some of the early Daju kings, who were expelled from restricted kingdoms in Kordofan and Darfur in some such upheaval as that caused by the coming of the Arabs. It is not unlikely that all the examples of divine kings between Meroe and the Great Lakes, and between Lake Chad and the west coast, enumerated by Seligman⁴ derive

¹ *Egypt and Negro Africa*, p.p. 37 ff.

² pp. 123, 152, 449, 146, 155, 157, 172, 163.

³ *A Sudanese Kingdom*, p. xv.

⁴ In *Egypt and Negro Africa* passim.

from Egypt via Meroe, especially since our examples from Darfur, Wadai, Bagirmi and Bornu, provide the connecting links between Meroe and Lake Chad ; while there seems little to support Seligman's suggestion that the Divine King was a very old widespread Hamitic idea which underwent some degree of development and transformation in ancient Egypt.

It appears probable that the pattern of the divine king, who at least theoretically is put to death when his human powers begin to fail, has been diffused from Meroe throughout much of Africa. It may well have needed a violent catastrophe such as the destruction of Meroe by Christian Axum-c. 350 A.D. to scatter the royal family of Meroe, and produce kingdoms such as those founded by the Daju and the Tumagera in which there is no evidence that king-killing was ever the rule, although the king was still treated as divine and much of the old ceremonial was retained.

There is another institution connected with the Darfur sultanate that appears to be derived directly from Meroe. Diodorus Siculus¹ reports of the Ethiopians of Meroe : " they say also that it is customary for the comrades of the kings even to die with them of their own accord, and that such a death is an honourable one and proof of true friendship. And it is for this reason, they add, that a conspiracy against the king is not easily raised among the Ethiopians, all his friends being equally concerned both for his safety and their own."²

Now it would seem that the explanation of the curious official who was known in Darfur as the Abo Kamni or Abo Fori³ can only be that it is a survival of the custom practised at Meroe in order to ensure the safety of the king. At El Fasher the Kamni was a kind of shadow sultan who had almost all the privileges of the monarch himself, and no obligations except that of being put to death if the sultan was killed. Tunisi⁴ recounted the popular explanation of the names of this and other old ranks at the Darfur court as meaning various parts of the sultan's body. As we shall see in the next chapter, there was nothing in the popular explanation except that the Kamni's alternative name Fori may have been derived from the Fur word meaning ' beard.' It is certain that Kamni does not mean ' neck ' or ' neck of the sultan ' in any language used in Darfur, as Tunisi says it does. Nachtigal repeats the explanation ' neck of the sultan ' and has a full and accurate description of the Kamni. He was informed that until the

¹ III 6.7. (Loeb trans.).

² Cp. also Strabo. *Geography* XVII, 2.3.

³ See MacMichael. *History* I. p.95 n. Abo is a courtesy title,

⁴ *Darfur*. p. 172.

reign of sultan Ahmad Bukr the Kamni was killed as soon as the king died. Tunisi says that the Kamni was put to death if the sultan was killed in battle, but tradition in 1916 held that the Kamni should die in whatever way the sultan died.

(to be Continued)

ملخص

هذا هو الجزء الثاني من تاريخ دارفور افردده لبحث اصل الشعب المعروف باسم « تنجر » وللأدلة التي تستخلص من وسم الجبال الذي يستعمل بين قبائل دارفور في الوقت الحاضر والذي يحتمل ان يكون اصله احرفا هجائية قديمة ثم يدعى الكاتب انهم كانوا يؤهون السلاطين القدماء حتى بعد دخول الاسلام

**NOTES ON THE NGORK DINKA OF WESTERN
KORDOFAN**
By P. P. Howell

CONTENTS.

INTRODUCTION

SOCIAL AND POLITICAL ORGANIZATION

The Age-Set System : Internal Warfare and Political Structure

The Problem of Authority : The functions of the *bany de ring*

CUSTOMARY LAW.

Homicide and Bodily Injuries

Procedure in Blood Feuds

Hurt

Marriage and Marriage Laws

The Social and Ritual Processes of Marriage

Forms of Marriage

The Distribution of Bridewealth

Divorce and the Dissolution of Marriage

The Violation of Rights in Women

FROM the point of view of Local Government organization, the Ngork Dinka of Western Kordofan are something of a problem. Situated as they are between the Baggara Arabs of the north and the main body of the Nilotic peoples in the south, they are in a peculiar position and the problem is whether they should be included in a Rural District Council in which Arabs must always predominate or whether they should be joined to kindred tribes further south. Should tribal and racial boundaries remain intact or should territorial associations be created in which tribe or race is of no consequence? There are purely practical arguments in favour of both such lines of political development. In the notes which follow I have made no attempt to answer this question, but merely to put on record something of the main characteristics of Ngork Dinka society; something of their social structure, of leadership and authority and customary law, and the way in which all these things have changed under the influence of Government. These changes are not at first apparent and it requires close scrutiny to reveal them, but as elsewhere in the Nilotic world, they gather momentum as the years proceed. We do not, perhaps, realise how rapid this process is and it is therefore all the more important to record now such of the past as can be discovered by interrogation and deduction and as much as possible of their way of life as it is at present.

My acquaintance with the Ngork is limited to short visits during two years in a predominantly Arab district, and a very large one at that. Added to this, these visits were naturally largely taken up with purely routine administrative duties. Having had previous experience of the Nilotic peoples, Dinka, Nuer and Shilluk, I had at least the advantage of knowing the broad principles common to all of them. Since, however, my experience among the Nuer far outweighs my experience of other Nilotic peoples, I may with some truth be accused of looking at the Dinka through Nuer eyes. I was aware of this danger at the time and though I have often drawn comparisons, it is noticeable that this method has revealed, in the main, differences rather than similarities.

Orthography.

With the exception of the Nilotic sound *Ch*—rendered as *C*—phonetic symbols have not been used in this article. Tribal names and sections have been spelt as they are in administrative correspondence, though this is not always consistent; *arweth* is sometimes *arueth*, *bioork* sometimes *biok*, and so on.

INTRODUCTION

The Ngork¹ Dinka, whose population is estimated at between 20,000 and 25,000, occupy an area along the middle reaches of the Bahr el Arab. They border the Rueng Alor Dinka in the south-east and the Twij Dinka to the south, and with both of these peoples have close cultural affinities. To the south-west are the Malwal Dinka. North of the Ngork are the Baggara Arabs of the Messiria Homr with whom they have direct and seasonal contact and they are therefore on the most northerly extremities of the western Dinka block, lying between the Nilotics of the south and the Muslim peoples of the north. This fact must be taken into account when we come to consider their social and political systems, though closer analysis shows that the influences of the north are but superficial.

There is a branch of the same tribe living along the River Sobat and centred on Abwong (Lat. 9° Long. 32.°) and Ngork of Western Kordofan sometimes refer to them as their own people, but there has been no contact between them for many generations. In the eastern area, tradition, both Nuer and Dinka, holds that they once occupied the northern part of the Zeraf Island and were split and driven out by Lou Nuer.² It is not possible to give an accurate date to this event, but from a comparative study of generations and age-sets (among the Nuer) and the maps of early travellers, the Nuer invasion of the Zeraf valley must have taken place early in the XIXth century. The Ngork do not mention this Nuer invasion of their original country and it may be that they migrated earlier. It is clear too that there were Dinka living in the present country of the Ngork long before the Nuer invasions eastwards started. We are told that the Baggara Arabs came into contact with Dinka in that area about the year 1745,³ but they may have been Dinka of different origin with whom the Ngork have now fused. Moreover, those Dinka coming from the east did not find the country empty on their arrival. There were other unspecified Dinka inhabitants at the time, but as among all Dinka tribes with whom I am acquainted, genealogies are unreliable and confused and the origins of the present tribe must remain obscure.

¹ Various spelt Ngok, Ngork.

² Who first occupied the Zeraf Island, but were later driven out by the Thiang and Lak Nuer.

³ See Henderson, K.D.D. 'Migration of the Messiria into South-West Kordofan—*S.N.R.* Vol. 22 pp. 57 & 76,

The Ngork say that they were led to their present country by Jok and his son Aiwel de Jok¹ (ancestor of Deng Majok, the principal *bany de ring* or "Chief of the Spear" and now President of the Court). They say that they lived in the east, but were forced to move because grazing was poor and their country was subject to floods. Their leader was Jok who had four sons and a daughter; Aiwel, Bulabek, Dhion, Biar and the daughter Acai. On their way westwards they came face to face with a river which they feared to cross. Jok, with creditable self-sacrifice, pushed his own daughter Acai into the river where she was carried off by the Spirit of the Water and in return the latter caused the waters to part and the people marched across dry-shod. Biar became leader of the Twij, Dhion of the Reik and Aiwel and Bulabek of the Ngork. Aiwel's son Adongbek, usually called Kwal Dit, had remained in their original country, but when Aiwel died, the age-set called *kiec* (or *kic*) of the Ngork went to fetch him to be head of the tribe.² His successors were Alor, Biong, Aruop, and Kwal³ all of the main Pajok lineage. The graves of these leaders still exist and are carefully tended today. This Pajok lineage who are *bany de ring*, 'Chiefs of the Spear,' hold a leading position in Ngork society. They are not numerically very large and do not have representatives in all sections of the Ngork. Numerically, the most powerful clan is that of the Dendior, also Chiefs of the Spear, who have lineages in nearly all Ngork sections. This tradition of migration from the east is, however, essentially associated with the Pajok clan, but is now part of the traditions of the whole tribe. Clearly the ancestors of the present Ngork tribe did not migrate at one period. Some were already in possession of Ngork country, others came later.

The Ngork Dinka occupy the area between approximately Long. 27° 50' and Long. 29° on the Bahr el Arab, extending northwards along the main watercourses of which the largest is the Ragaba Um Biero. The definition of a tribal group among so large a congeries of people as the Dinka is difficult. The Ngork claim close association and relationship with those Rueng⁴ Dinka called Alor who live in Western Nuer District north-west of the Bul Nuer, and it might be argued that the two are primary

¹ Aiwel, Ayueil etc. see Ibrahim Bedri, 'Notes on Dinka Religious Beliefs,' *S.N.R.* 22, 1939 and Howell 'Pyramids of the Upper Nile Region.' *Man.* 1948. There appears to be some connection, but the mythology of the cultural hero Aiwel is common to nearly all Dinka tribes.

² *kic*—*kiec* is a term often used to denote the common people among the Dinka as opposed to Chiefs of the Spear.

³ Government Chief and Court President: died 1946.

⁴ Sometimes spelt Ruweng.

segments of one tribe. They say "they are all Ngork,"¹ but there is no definite tradition of common action either in defence or offence between them and the distinction between the two has been increased by administrative action which has placed the Ngork in Kordofan Province and the Alor in the Upper Nile Province. Although there is clearly no bar to social or economic contact, artificial divisions of this sort imposed by the administration often tend to destroy previous political co-ordination and to create new alliances. In such circumstances it is usually difficult to test the validity of traditional claims to unity.

The Ngork are rich in cattle² though possibly less so than their southern Dinka neighbours. The country north of the Bahr el Arab is heavily wooded, and afflicted with disease-carrying flies (Tabanids, *Stomoxis* etc.) and, in recent years at any rate, their herds have been much depleted by trypanosomiasis as well as by rinderpest and contagious bovine pleuropneumonia. Permanent villages, and cultivations are set along the higher ground north of the Bahr el Arab, while dry season grazing grounds are for the most part in the open grassland (*toich*) south of the river.³

Villages are usually built close to the river or to one of the main water-courses, since water is more easily available during the early part of the dry season, either in pools or shallow wells dug in the river bed. Clusters of homesteads each consisting of several living-huts (*ghot*) and one or more cattle byres (*luak*) are built in an almost continuous line along these rivers. The Ngork are partially migratory like the Baggara to the north and their Nuer and Dinka neighbours to the south, but they are not compelled to move very far. Dry season pastures, even at the end of the dry season when water supplies are running low, are sufficiently close to the areas of permanent habitation to allow the elder people to remain there, provided there is enough grain to feed them away from the cattle. The majority of the younger generation spend their time during the dry months of the year in the cattle camps to the south, returning from time to time to assist

¹ Though this is not admitted by all sections of the Alor.

² Bridewealth average seems to be about 30 head of cattle. There are no accurate statistics available, but the ratio of human to cattle population probably compares favourably to the average throughout the Nilotic area.

³ "*Toich*" Baggara "*Sahala*"—or open grassland—is mainly in the area south and south-west of the cultivation area. In the latter region there are many outcrops of sand-soil with wide spaces of harder less pervious soil, mostly cotton soil. There is thick bush and forest with large shady trees on the banks of the Bahr el Arab and water courses. The grasses are mixed with a heavy growth of flood grasses—*Vossia cuspidata*, *Echinochola stagnina* etc., etc.,—in the *khor* beds.

in the repair or rebuilding of their houses or in clearing the ground for the cultivation season.

The Ngork recognise four main seasons which are associated with specific economic activities :—

(1) *ker* (May—June—early July) : the early rains when the cultivations are cleared and planted and the herds are gradually brought back to the permanent villages. Since there is little grain left at this time of the year, part of the herds must be brought in to provide food for those who are engaged in agriculture, although there is no real need to return until July when the mosquitoes begin to increase and the cattle must be protected at night in the cattle-byres.

(2) *ruil* (July to October) : the period of heavy rains and permanent habitation in the villages of all the tribe. This is the time for agricultural processes and the period ends with the harvest. They also speak of the end of the rains as *anyoic*, a period when the cattle first leave the villages for grazing further afield, though they are brought back during the actual harvest.¹

(3) *rut* (November—February). Period of the early part of the dry season. *rut* is associated with, and comes to mean, the prevailing north wind which starts to blow in November. The older people usually remain in the villages at this period, to complete the processes of the harvest, while some of the younger men start to gather wood and wattle for the repair of their homes and thatching materials are cut before the grass is burnt off. In addition, the younger able-bodied men are occupied in road-making and other tasks now demanded of them by the Government. The pasture, in this area, mostly annual grasses, is soon exhausted and cattle are driven out in small herds to grazing areas in the forest and along the upper reaches of the watercourses, but are later, about the beginning of January according to the climatic conditions of the year, driven southwards and across the Bahr el Arab to the summer camps. Generally speaking there are two migrations, the first northwards in small groups,² the second southwards, when herds begin to concentrate in larger numbers, finally forming the main cattle camps which do not break up until the early rains.

¹ There are in fact two harvests ; that of the first crop (*rwath*) sown in the early rains and cut in September and the second crop (*angwal*) arising from the stubs cut in the first harvest which is gathered in November or sometimes later.

² There is usually plenty of grazing in that part of the country, but not sufficient to support large concentrated herds over a long period. Moreover water supplies dry out early and the Baggara herds from the north begin to enter the area about this time, occupying the remaining water points which they regard as theirs.

(4) *moi*¹ (January—April and May). This is the period when the final concentration of cattle into big camps takes place during the hottest time of the year and the bulk of the population are away from the permanent villages. Water supplies (except from shallow wells) are scanty and there is little green grazing left near the villages. It is also a period of intense activity in fishing, since the rivers and water-courses are drying up into pools and shallow lakes. Fishing takes place at most times of the year, particularly in November when the fish are following the dropping flood water into the main perennial river and can be trapped and speared from dams built across the stream, but in February and March collective fishing by large numbers of people takes place.

I have summarized these activities in the briefest form possible. In their dependence on seasonal change, the rhythm of dry-season activities followed by rainy season activities, the Ngork are no different from other Nilotic cattle-owners, nor indeed in general principle from the semi-nomadic Baggara Arabs who live to the north of them. For cattle their country is not of the best owing to the prevalence of biting-flies, and agriculture is precarious owing to the uneven distribution of rainfall from month to month². The Ngork are not enthusiastic agriculturists. This is partially due to their intense preoccupation with cattle like other Nilotics, but I suggest, and I think this is sometimes ignored by those who seek to analyse the Nilotic way of life, that preoccupation with cattle and the complex social system which it involves, is the result of climatic conditions rather than an inherent dislike for agricultural activities. The vagaries of rainfall and the endless chapters of disaster which are the result, are sufficient discouragement even without the counter attraction of cattle and are enough to inculcate an almost instinctive dislike for back-breaking agricultural processes which often give little in return. Grain is necessary for beer and for existence, but the Ngork cut the effort involved to a minimum, for there is no point in clearing the ground for a surplus which rarely materializes. In lean years the Ngork buy any grain they may require from the Baggara who,

¹ I have heard this pronounced *mai* in some parts of *Dinkaland*. Ngork deny that it has any connection with Nilotic root *mzi* meaning 'fishing' or *mai=mac* meaning 'fire.'

² The overall annual rainfall is probably fairly consistent and adequate, but periods of drought when the young crops are starved of water and perish or periods of heavy rainfall and hence flooding cause many set-backs. In this the Ngork suffer a disadvantage common to most Nilotics, though their country is on the whole better drained than the areas further south.

if they have not surplus themselves, purchase it from the Hamar agriculturalists who live north of them, for export to the Dinka.¹

The Ngork have been subjected to external influences which may account for cultural differences when compared with other Dinka tribes.

I. Arab influences:

As we have seen, the Ngork, or at any rate those elements of the Ngork who originated in that area, have been in close contact with the Baggara for at least a century and a half. Contact has been more or less consistent throughout that period and although the Dervishes and Arab-slavers undoubtedly raided the Dinka at one time, relations have not been continuously unfriendly. Since the establishment of the present Government, the Ngork have continued to live peaceably with the Messeria Homr. The leaders of the latter tribe have a friendly though somewhat patronising attitude towards them and the Ngork are sometimes jokingly referred to as the "Messeria at tawil"; the "tall Messeria." During the dry season, and sometimes in time of famine, the Ngork migrate in large numbers to Muglad, a small market town which is now the administrative centre of the Homr Baggara, seeking work of some sort. They are often employed by merchants and the sedentary population of Muglad town on a variety of jobs; carrying, cultivating, cutting grass and so on, for which services they are paid in cash. With the Baggara tribesmen, however, a peculiar form of relationship is often established in which an impoverished individual or even a whole family of Dinka will attach themselves to a Baggara *ferig* (cattle camp) giving their assistance in herding the cattle and in cultivation in return for food. This attachment may be for the dry season only or for the rains only, but sometimes lasts continuously for several years. In some cases the motive is to earn enough cash to purchase a few cattle to start a herd, in others the bare necessity for some sort of subsistence.

Intermarriage between these people is rare. In the past undoubtedly the Baggara took a fair proportion of Dinka slaves as concubines and produced offspring from them.² There was no intense social barrier between Baggara of older Arab stock and the sons of slave women, for the son took the status of his father, but this form of union had no influence on the main body of the Dinka because no social relationship was established between the Baggara and the womens' relatives. Similarly, nowadays

¹ The Ngork sometimes have a small surplus which is sold or bartered and there is, in fact, a considerable and perhaps growing trade between the two peoples.

² To the Baggara, sons of Dinka mothers are not necessarily debarred from political equality or high position. This form of descent is not perpetuated and the fiction of pure descent from Arab stock is maintained.

Baggara will sometimes "marry" Dinka girls from those impoverished families who live with them, but they do not pay cattle for them in sufficient numbers to be called bridewealth and a social relationship is established between the Baggara and the immediate family only of the girl, not with her more remote relations living in Ngork country. A Baggara man married to a Dinka girl in this way might give special hospitality to any of her relatives visiting Baggara country, but the social ties established by the union in no way even approximate to those raised in marriage between Dinka and Dinka or, indeed, between Dinka and Nuer. Hence such marriages as do take place are not likely to have a far-reaching effect. Such unions are not marriages in the true sense to the Dinka because no bride-wealth is paid and because the social and ritual processes are not performed. The Dinka system is exogamous and involves a reciprocal system of obligations and cattle payments, both then and in future generations, set up by the transference of bridewealth. There is no theoretical exogamous bar to marriage with the Baggara for there is no kinship relationship, but the Baggara world is outside that of the Dinka and it cannot be spanned by inter-marriage. To the Dinka reciprocal marriages with other Dinka tribes, with Nuer or with Shilluk, are possible, though perhaps not desirable, but are not possible with the Arab. Arab society is segmentary in almost the same way that Dinka society is segmentary, but the social structure is maintained and indicated by an entirely different system. The Arab system is essentially one of preferential mating and a man should only marry, in a full social and religious sense, a woman to whom some form of kinship relationship, real or fictitious, can be traced.¹ Thus with the Arab's sense of superiority derived from religious tradition and an inherent arrogance and with the Dinka's independence of spirit and inherent suspicion of the Arab, no marital association approximating to normal union in either society is possible.

Apart from a necessary reliance on Arab resources in time of famine, economic exchange is not great because of the Dinka's limited desire to trade. There are small sales of hides, skins and sometimes even cattle to the Arabs, but the Ngork do not have any great desire to earn money except in years when their crops have failed or, at any time, to earn enough to buy cattle. There is a common system which persists at all times in which the Arabs barter cow-calves for full-grown oxen which they sell in the main markets at Nahud or el Obeid.²

¹ Cousins and more distant relationships, but not within the degrees forbidden by Islam.

² This system of exchange between Arabs and the northern Nilotics is almost universal, though the introduction of northern stock into areas further south is rarely successful.

To the casual observer seeing them at Muglad or even in their own homes, the Ngork Dinka may appear deeply affected by Arab influences. Closer observation shows that the so-called process of "Arabization" is only skin deep. In deference to Arab custom, they like to adorn themselves with any old rags they can procure on the way to an Arab market and some certainly have acquired a desire for clothes. A few of their leaders like to wear the *gallabia* of spotless white and even, to the horror of Dinkaphils, to perfume themselves with cheap scent. A smattering of Islam is sometimes acquired of the kind which is easily displayed; occasional genuflection or even the reading of the *Fatha* at a marriage feast which to them appears to be some form of magical blessing quite divorced from the text; but even a soulless imitation of the main tenets of Islam is unknown except to those Dinka who have been completely absorbed into Baggara society. 99 per cent of the Ngork, despite generations of contact with the Arab, are quite unaffected by any form of Islamic traits and are as completely Dinka as their Dinka neighbours to the south. Yet all adult males are circumcised, and have been for several generations. To them circumcision represents only a physical mark in the normal process of growing up and perhaps has far less meaning than the usual cutting of the forehead with the tribal mark. Circumcision has not been accompanied by even the most modified form of the Mohammedan religion.

II. Nuer Influences.

The Ngork are not now in close contact with the Nuer, although intermarriage in the full sense of the word sometimes takes place between them. Like other Dinka in the area, they have from time to time been subjected to large-scale raids by the Nuer, particular from the Leik and Bul Nuer, and it is clear that these raids have been going on for some generations.¹ The Ngork are now marked on the Nuer pattern called *gar* which consists of six horizontal cuts across the forehead, unlike the method further south which consists of cuts branching like the rays of the sun from the centre of the forehead. The Ngork say that two generations ago, in the lifetime of some of the older men, no tribal markings were employed at all, but that the custom called *gar* was brought in by those later sections termed generally the *Pancieng* (as opposed to the *Koic*). Some Dinka say that it was employed for protective reasons, for Dinka thus marked are not

¹ It is said that the Nuer had a rude shock when they first came up against the Baggara, for in those days the Baggara men wore their hair long in the form of pig-tails and the Nuer took them to be women. This is told by the Baggara themselves, but is scarcely founded on fact for Nuer women have their hair shaved while the men wear their hair long. Long hair to a Nuer does not necessarily indicate the female sex.

easily distinguishable from the Nuer, at any rate at a distance.¹ The Ngork are in no sense bilingual like some Dinka tribes deeply affected by Nuer influences, though a small proportion of them, particularly those who have marital connections with the latter, can understand Nuer. It is possible that the *Koic*, the original Ngork, had no Nuer affinities at all. The *Pancieng* clearly had considerable contact with Nuer (or with Dinka deeply affected by Nuer) as adoption of the Nuer tribal markings would indicate, but other cultural affinities, Nuer in origin, are not easy to locate.

SOCIAL AND POLITICAL ORGANIZATION.

Divisions, Sections and Sub-Sections.

The Ngork speak of certain sections who are *koic* or 'original migrants,' while others are spoken of as *pancieng* or 'new comers.' This distinction does not appear to have any great functional significance either in everyday usage or in the political structure of the tribe. All sections other than the ALEI, ACAK, BONGO, (who are *Pancieng*) call themselves *Koic* and are also called collectively AKOK which amounts to the name of a tribal division. The word for a tribal division or segment is *wut* and is relative like the word *cieng* in Nuer or *podh* in Shilluk, although the structure does not seem to be identical. *Pancieng* and *Koic* are in no sense the names of tribal segments and the words merely refer to their origin. It is probable that the Nuer equivalent is *diel* and *rul* (meaning "original" and "new comer"), but whereas in Nuerland these terms are relative to the position in the social structure of the persons concerned, this is not true of the Ngork terms. Nor can those who call themselves AKOK be called a primary segment of the tribe because the remaining segments are not grouped together in opposition and have no tradition of any special political alliance or any sense of corporate unity. I suspect that the position would be clearer if a full analysis of the Rueng Alor could be made, for the Ngork allege that they are one and the same

¹ This is often given as a reason by Dinka who employ Nuer markings. It is difficult to believe that this was an effective disguise, for a Nilotic can usually tell a man's nationality, and even his particular tribe, at a glance.

people. "We and the Alor are all Ngork"¹. It is possible too that those sections calling themselves AKOK should be regarded as Ngork proper and as such a primary tribal segment, to which a counterpart may be found among the Rueng Alor.

I cannot answer this question without knowledge of the latter, but under these circumstances, those sections classed as *Pancieng* must be regarded as late-comers living alongside, but not entirely absorbed into the political system. We await further information on the subject of political systems of other tribes, but I believe that this kind of situation is to be found elsewhere in Dinkaland because the warlike upheavals of the XIXth. century have so disorganized the Dinka and caused so many migrations in search of refuge. One finds the remnants of a balanced tribal system to which new-comers are attached in the form of an alliance and people thus loosely allied will call themselves by a common name in opposition to other peoples. In Nuerland this process of assimilation of incoming accretions has always been on a more or less individual basis or at any rate on a small scale. The structure of the dominant lineage has been maintained without disruption and new-comers are absorbed into the system without unduly disturbing the balanced opposition of groups, which is characteristic of the Nuer system, and without overmuch confusion caused to the fiction of common descent which runs right through the structure. In Dinkaland, however, following the tremendous upheavals caused by Nuer invasions, whole segments of tribes, or groups of people from one tribe, have been forced to move and take refuge with other tribes or with segments of tribes in similar circumstances. Common sentiment has

¹ The main sections of Alor are MAJWAN, THEINYIR, AMAL, MANPENG, NGONGCIL and ABANG. They say that those people who now call themselves Ngork are JOK ALOR, while the ALOR are RUENG ALOR and all of them are Ngork; in other words two primary segments of one Ngork tribe. It must be remembered that until comparatively recently both peoples were administered in Western Kordofan district and that Kwal Aruop was recognised leader of both. Woic de Micar (also of the Pajok clan from the Alor) was chief of the THEINYIR, MANTENG and NGONGCIL sections, while a brother of the present Alor president, Kur de Kwot, was considered Kwal's assistant and responsible for the whole of Alor. Kur de Kwot is of Dendior extraction. These claims, which may well be denied by the Alor themselves, are not above suspicion. Political aspirations of a modern kind are involved, since the Ngork, or rather the Pajok clan, would like to extend their power beyond their present boundaries. A section of the Twij Dinka of Gogrial District are also said to be Ngork. The section is called KWAC.

emerged in the course of a generation or two and an attempt is made to find some tradition of common descent to explain the existing association. There is a feeling that they should all be linked by a tradition of common descent, and, when approached on the subject by strangers, Dinka like to pretend that this is fact. Closer analysis of their genealogies reveals only confusion. Genealogies three or four generations back can be remembered and quoted, but beyond that a jump must often be made to the founder ancestor of the group to which the speakers lineage is attached. Among the Nuer, the genealogy of the dominant lineage is known and creates a stability in political structure now unknown to many Dinka tribes. In Nuerland the pattern is widely known and remarkably consistent, so that a knowledge of one Nuer tribe gives the clue to all other Nuer tribes and the key in each case is the genealogy of the dominant lineage. There is as yet insufficient evidence available to generalize on the Dinka tribes in this respect, but there are indications of greater differences than among the Nuer tribes.

Each of the main tribal segments is termed *wut* in Dinka, for the word is relative. Given that, MANUAR, AWET, DUL, ABYOR and ACWENG are primary segments of AKOK, MALUAL, MATIANG, and MIYAR are segments of MANUAR and secondary segments of AKOK and so on, but the use of these terms which so accurately describes the Nuer system, only leads to confusion if applied to the Ngork Dinka. We are faced with the usual difficulty of describing the component units of segmentary societies. The AKOK do not combine as a whole and have no definite tradition of collective action. Nor do they have a common territory. Similarly the AWET division (of AKOK) have no more than a vague tradition of a common bond.

The main sections (again called *wut*) are now administrative units and have clearly received extra emphasis for that reason. Within them are the sub-sections also called *wut* which have the same characteristics as the larger sections with certain exceptions. If I employ the terms primary and secondary segments, there will be confusion both in comparing Professor Evans-Pritchards accounts and my own of the Nuer already published and with those of Mr. Leinhardt's accounts of Dinka tribes to come; so for the purpose of this short account I prefer to call them "main divisions," "divisions", "sections" and "sub-sections" of the Ngork "tribe."

Territorial sections (*wut*) are explained by the Ngork in terms of age-sets rather than in terms of kinship. The names of territorial divisions or sections—ALEI, MANUAR, ANYEL etc.—are said to be those of former age-sets and, in explaining the system, the Ngork seem to visualise a series of definite age-divisions. They will say, for example, that MAREANG was originally an age-set and from this another age-set called MANYANG split, leaving two divisions—the MAREANG and MANYANG. They talk of MANYANG as a 'younger' age-set of MAREANG and refer to a phenomenon of especial significance which they call *bioork*. *bioork* means an institutionalised battle between a younger age-set and a senior one, and it seems that when the latter are about to retire from the active pursuits of the young warrior into a status which approximates to a more stable existence as married man and father, a form of ordeal is necessary so that the younger men can prove their worth. The initiative does not necessarily come from the junior age-set, but usually does, and in the form of rude songs which cast reflection on the waning popularity among the girls of the age-set senior to them. Fighting often follows, though clearly of a rather stylised form and since spears are not usually brought out, there are rarely fatalities, though often severe injuries. Several such fights occurred in 1946-47 and were penalised by the Dinka Court of the area.

The Ngork say that after a fight of this sort, the younger age-set, representing a younger generation, would break away to form a camp (*wut*) of their own and this would develop into a more permanent division of the tribe. In this way in the example quoted, the MANYANG age-set split off from the MAREANG age-set and formed a distinct section, being settled in a definite area and, during the dry season, using a distinct grazing area within that usually regarded as the right of the whole section called collectively MAREANG. I do not think that a collective move of a separate age-set to form a camp and settlement of their own was ever actually carried out, but that the formation and evolution took place in the usual Nilotic manner by the men of a younger generation moving away from their fathers' homesteads to form their own, and possibly migrating to another part of the country. Since a collection of such family groups are not in the initial stages linked by clan ties, the bond of a common age-set running through their generation emphasises their unity and among the Ngork the age-set system (see p. 258) seems far more developed than among the Nuer, and perhaps Dinka tribes elsewhere, and of greater functional significance. As we have seen age-set nomenclature does not extend beyond

the tribal 'section' and the section is also a political unit of society and, indeed, the largest effective political unit in the past. For this reason, when they talk of an age-set by name, they are also referring to a territorial division of society, for the name does not usually extend beyond that division. It seems that the dominant age-set at the period of formation of a tribal section gives it its name. In the case of the BONGO section, age-set nomenclature is restricted to the sub-sections,¹ and in this sense at any rate the BONGO as a whole must be regarded as a division of the tribe on the same scale as AWET (which includes ANYEL and MAREANG) and the AKOK division (which includes MANUAR, AWET, DIIL, ABYOR and ACWENG).

Age-set nomenclature is not common to all these people collectively, only to those groups which I have defined as "sections," and AKOK as a group have not the same political reality nor any sentiment of co-ordination sufficiently strong to inspire common action in the face of opposition from without. Thus there are no traditions of common action by *all* the AKOK sections against the BONGO, or by the ANYEL and MAREANG, combined under the name of AWET, against other such combinations of groups. I can say, and clearly the matter requires further investigation, that what I have defined as the 'section' is the largest political unit of Ngork society which actually functioned as such in the past. Beyond that there exists only a vague tradition of alliance and combination of certain sections as opposed to other sections. One cannot define these groups accurately because they are 'unbalanced,' unlike the Nuer where sections are 'balanced' and can be easily defined as primary, secondary and tertiary sections and so on. Beyond the 'section' there are tribal 'divisions' which clearly had significance in the past, but which do not actively function as such today. The matter is complicated by the fact that the new-comers, the *pancieng* people have no common bond, whereas the "koic" or "originals" are at least all collectively known as AKOK. On this basis the tribal divisions can be set forth in diagram 1.

¹ As will be seen later, the latest age-set of the Bongo has been unified under one name. The BONGO are now united and can *now* be defined as a section. This may be a natural process, but it has clearly been accelerated by the fact that they are treated as one section by the administration.

Diagram I.

UNITS OF NGORK DINKA.

MAIN DIVISIONS.	DIVISIONS.	SECTIONS.	SUB-SECTIONS.	
AKOT	All referred to as <i>Koic</i>	AWET	MANUAR..... { Malual Matiang Miyar (3874)	
			ANYEL..... { Anyel Jongyom (2340)	
			MAREANG..... { Mareang Manyang (2119)	
				DIIL..... { Ajiej Nuer Adur Joklei (4149)
				ABYOR..... { Mateang Abek (3204)
				ACWENG..... { Nyor Dwor (1620)
No special name and not classed as a Division.	All referred to as <i>pancieng</i> .		ACAK..... { Beghot Yungkor (1125)	
			ALEI..... { Amar Guil (1804)	
			BONGO..... { Kwac Awet Adar Yom (3988)	

Figures given in brackets show the population of each section ; Estimate based on adult males registered for taxation multiplied by 4.5

Each section is therefore characterised by :—

- (a) A common name.
- (b) A distinct and effective sentiment of a common purpose both for offence and defence. This was a reality, for sections often combined against each other, and there is still an active attitude of political rivalry.
- (c) A common area of permanent habitation, though, nowadays at any rate, the boundaries are far from distinct.
- (d) A common grazing area which includes rights in fishing and hunting. A section would combine to protect their rights to this area and would fight if necessary.
- (e) A common system of nomenclature in age-sets, e.g. age-set names run through the section and not beyond (except, in the past, in the case of the BONGO section).¹

Sub-sections have these same characteristics except that they do not represent the limits of age-set nomenclature. Within them there is no further territorial division, but a lineage system ; the lineage within the sub-section being territorial in basis and an off-shoot of a clan which may have representative lineages in many sections.

Clans and Lineages.

Clans, which are theoretically exogamous and can trace descent to a common ancestor, are thus divided into a large number of lineages resident in widely separated parts of the country. In other words clans are not resident in any one *wut* or section, but have representative lineages in most of them. Clans are called *dhin*, a term which would also be applied to a lineage resident in one area. A *dhin* or clan is usually preceded by the suffix *pa* or *fa* which is a relative term meaning 'home' of, 'people of' (as in most Nilotic languages). There are people of the same clan living in different sections. For example the FAJING clan have lineages in the Abek sub-section of the ABYOR section and in the Matiang and Miyar sub-sections of the MANUAR section and so on.

The section is therefor an alliance of lineages who are bound by a strong sentiment of co-ordination. There is usually a dominant² lineage within each derived from one of the main Spear Chief clans—Dendior or Pajok,

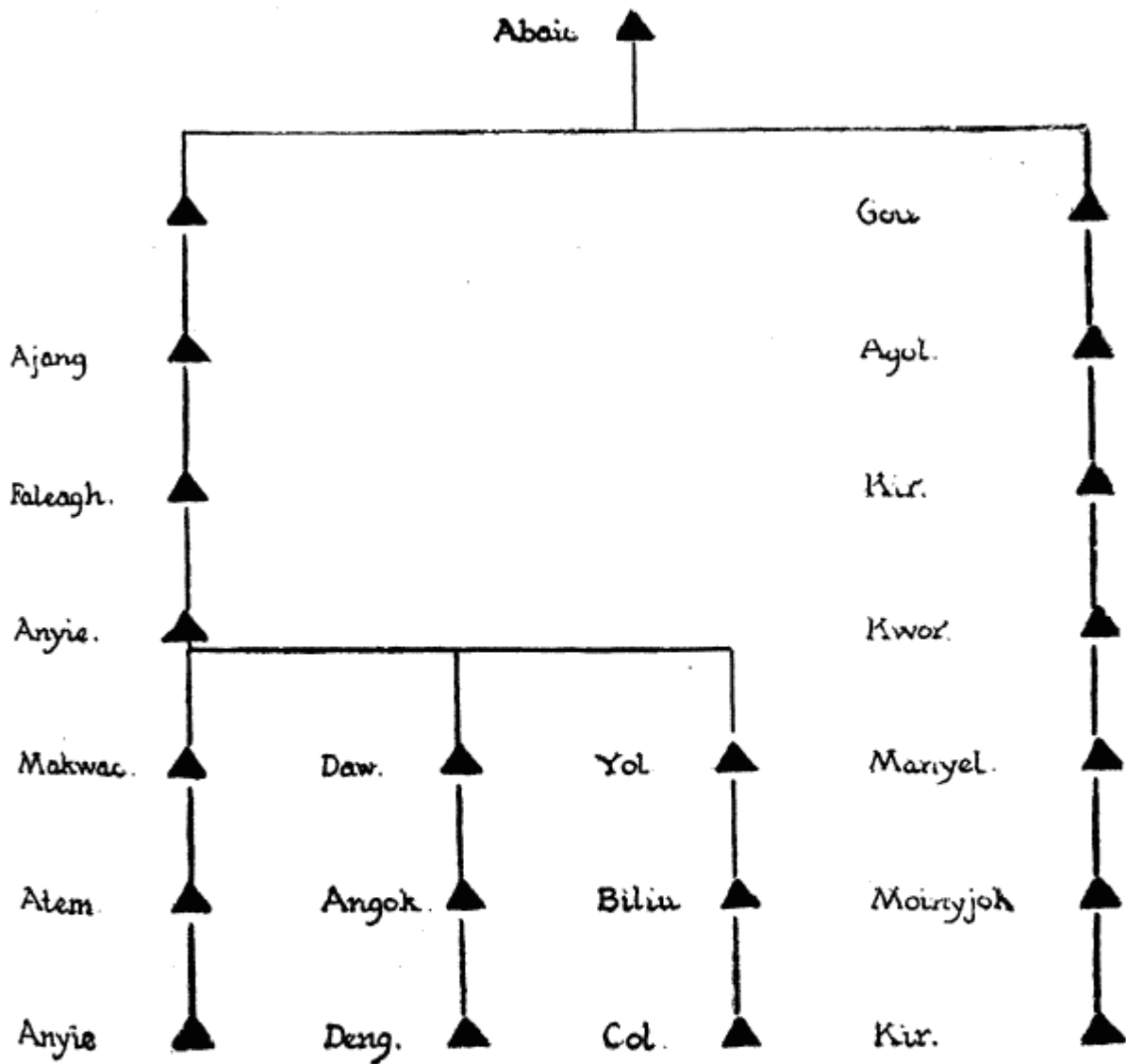
¹ See p. 258

² Dominant in a somewhat different sense to 'Dominant lineages' of the Nuer as described by Professor Evans-Pritchard. It is significant, however, that leaders and representatives are usually drawn from this lineage in each case, as will be seen later,

but there is no clear-cut pattern of genealogical relationship involved. For example in the MANUAR section, the Dendior lineages are descended from Bakat (Akot de Bakat) and in a sense all people of MANUAR will call themselves 'sons of Bakat,' but they appreciate that this is only a fiction and cannot trace true descent from Bakat; nor do they usually attempt to do so even through the female line. This fiction of relationship within the section is maintained in connection with blood-feuds and, although in the composition of a blood-feud compensation cattle (*puk*) will be paid only to the lineage (*dhin*) of the deceased, all others of his section may, in the final event, consider themselves involved. Theoretically genealogical relationship can be traced between the members of all lineages of one clan, but in the fact the genealogies are vague, tend to omit intermediate ancestral links, and rely more on possession of a common totem spirit and possibly a common founder ancestor.

As examples, the genealogies of a few lineages of the Pabaic clan are recorded in the diagram opposite. The intervening links in some cases are forgotten and confused, but members of this particular kinship group, whatever their distance apart, consider themselves one clan and do not intermarry. Clearly, however, the members of one localised lineage are more intimately associated and, in the balance of loyalties involved, a lineage of one clan resident in one section or sub-section will have considerable corporate unity. Seen in this way, a conflict of loyalties seems bound to arise. A section or *wut* is considered to be a fighting unit and closely allied in political affairs. In a conflict between section A and section B, would members of clan C in section A fight against members of clan C in section B? I have put this question to the Dinka many times and it is clear from their answers, that the conflict does not arise. One does not fight one's relatives and hence, theoretically at least, they would try to avoid one another in battle, but clearly in fact the members of one lineage in section A will not know personally all the members of their clan in section B. In moments of opposition between territorial groups, ties of kinship relationship, in any case remote, are temporarily forgotten.

The clan only operates on a plane where marriage is involved and only in the sense that intermarriage between members of one clan is theoretically forbidden wherever they may live. Even in marital affairs relationship between clan members resident in different areas is far too remote to involve reciprocal obligations in the collection and receipt of bridewealth cattle. This is not always so, for sometimes a man will migrate with his family to another part of the country, and his family will retain for a generation or two sufficiently close contact with the lineage of their origin to maintain



ALEI : Amar

BONGO
Kwac Yom

ALEI : Gull.

such reciprocal payments. Clans are apparently fully exogamous.¹ A man from the Pabaic clan living with the ALEI section will not marry a Pabaic woman from the BONGO. The bar to marriage is sometimes extended between two clans. For example the Pabaic clan do not intermarry with Fawany. Sometimes the connecting link is a remote one through the female line. Pawok do not marry from Padol ; Falil do not marry Pabaic and so on. In the individual family, recent descent in the female line precludes intermarriage, but the prohibition does not extend to all members of the lineage and certainly not to the whole clan.

The Ngork are therefore, divided territorially and politically into "main divisions" "divisions," "sections" and "sub-sections." The term used to denote all such divisions and sections is *wut* which is therefore a relative term. The Ngork themselves could not analyse their tribal system in this manner. If you asked a man his *wut*, he would probably quote the same of his "section." He would do so to a representative of the Government, for the section is of administrative significance and he would be thinking in administrative terms. He would say ANYEL, or DIIL or ABYOR etc. as the case may be. Pressed further, and within the context of the section, he would give the name of his sub-section and within that his lineage or homestead. Beyond the section he would not go except in unusual circumstances. It is unlikely that he would say that he is AKOK except in a historical discussion and he would not refer to himself or his people as *koi* or *pancieng* unless the conversation concerned tribal origins. The divisions have no functional significance today any more than the terms used to describe them form part of every-day conversation. Nowadays the individual Ngork thinks of himself as NGORK, ABYOR and of the ABYOR, ABEK. Beyond that he is a member of a local lineage : He is Pathiang or Patwor, resident in the ABYOR section. The position, when analysed, may seem confusing. It is not confusing to the Dinka. His status is defined in a number of different ways according to the context of the situation : his general position in society is classified by his membership of a section, or sub-section (*wut*) ; his individual position is classified by age according to his age-set (*ric*) ; by kinship according to his lineage (*dhin*).

¹ This statement is admittedly made with some misgivings. Ngork Dinka say that all members of a clan are forbidden to inter-marry. Theoretically this may be so, but one suspects that, as among so many Nilotic peoples, it is the lineage which counts, and bars to intermarriage depend largely on the relative degree of relationship in the lineage structure. The matter requires further investigation.

**THE AGE-SET SYSTEM :
INTERNAL WARFARE AND POLITICAL STRUCTURE.**

Before turning to the subject of Customary Law in the past and as administered in the Ngork Courts today, something must be said about the age-set system which appears to have a greater functional meaning to the Ngork than any other Nilotics, Dinka, Nuer or Shilluk, of whom I have had first-hand experience.

The age-set system among the Nuer stretches across a whole tribe and nomenclature sometimes crosses tribal boundaries.¹ Among the Ngork, as we have seen, nomenclature is limited to the tribal section or *wut* as defined for the purposes of this article. The name of the junior age-set among the ALEI is *TOR*, among the DIIL, *ANYAR*, among the MANYUR, *AJUONG* and so on, and although a man of *ANYAR* will know that his equivalent among the MAREANG is *COL*, the system is essentially a sectional affair. In this the Ngork are similar to the Shilluk where age-sets are confined to the settlement.² This fact emphasizes the distinction between one tribal section and another and also, since the age-set system is a military one, their potential hostility. Initiation takes place every few years, and consists, as we have seen, of the ceremony known as *gar* at which the foreheads of the youths are cut. This usually takes place early in December when the north wind begins to blow so that by exposing their foreheads the wounds will cicatrize and become clearly marked.

At this time of the year the cattle are already in the dry season camps and since the initiates are not allowed to leave their permanent homes, there is no chance of their coming into contact with the herds. Initiates are temporarily deprived of ritual status and it is considered dangerous for them to approach the cattle. There is no institutionalised camp where they are segregated from the rest of the community, but since they are restricted to the permanent villages while the bulk of the population is away, they have little contact with the main body of their fellows. At the end of about two months, when their wounds are healed, the initiates appear in public and move about in groups, but only at night and wearing the tall head-dress made of palm fronds which is a special symbol of their condition. Finally a large dance is arranged which is attended by all initiates of one section. A bull is sacrificed (the colour name of the bull is often adopted as the age-set name) and beforehand the initiates are bathed and ritually purified.

¹ See Evans-Pritchard : *The Nuer*. Clarendon Press 1940.

² See Howell. 'The Shilluk Settlement.' *S.N.R.* Vol. 24. 1941.

Apart from warfare and defensive organization, the principal function of the age-set system concerns the division of meat at marriage ceremonies and other communal gatherings. There is a conventional method of distribution, the meat being divided according to strict rules. Disregard for these rules is likely to cause grave offence and may lead to a clash between age-sets. For example a man called Juac de Can of the *WORKWEI* age-set of ALEI recently made a sacrifice of a bull to the spirit of his dead father. His paternal uncle distributed the meat according to the rules. Members of a junior age-set (*TOR*) objected to the system of distribution and after much bickering, a youth of the *TOR* age-set seized a piece of meat to which the *WORKWEI* considered he had no right. He was instantly knocked off his feet and a general fight started, but was stopped by the intervention of elders present. Police were called in and twenty-five head of cattle held by the administration as a pledge of good behaviour. Despite this, hostilities were renewed and when the men of ALEI went off to clear the roads later in the year a further clash took place which was again stopped by the police after several wounds had been inflicted, though none of them serious. It should be noted, however, that spears were not brought out and only sticks were used.

At the same period fights took place between the *ANYAR* and *TAYAR* age-sets of the BONGO Awet section and again between the *KIEC* and *ANYAR* sections of *bongo* Kwac. As we have seen such fights are called *bioork* in Dinka and express the latent rivalry between junior and senior age-sets which finally results in the juniors usurping the status and functions of their elders.¹ Sticks only are employed and fighting helmets often worn and, although there may be many broken bones, there are usually no fatalities. Dinka authorities, however, frown on the practice and say that it should be stopped, an attitude which is not entirely derived from the influence of the Government. This form of fighting is clearly something quite different from hostilities which take place between the lineages resident in the same section. Hostilities of this latter kind can easily develop into a serious fight in which spears may be brought out and, if between two lineages resident in different sections, may become a general conflict. Age-sets play no part in the fighting organization of the groups concerned if they are within one section, but if two or more sections are involved, the warring parties may be organized into their respective age-sets. There thus seem to be three different forms of fighting.

¹ Mr. Leinhardt has suggested to me that such fights mark the division between the sub-sets who have been recruited over a number of years and the inclusion of some into the senior age-set the remainder forming a new age-set. This is certainly in keeping with both the Nuer and Shilluk system. Cf. Howell, *S.N.R.* 24, 1941 & *S.N.R.* 28, 1947.

- (i) *bioork* or clashes between a junior and senior age-set within the section. This is a conventional expression of opposition between them and normally restricted to the use of clubs and protection from helmets. This is part of the institution and is necessary in order to emphasize the distinction between age-sets, to teach the younger warriors how to fight and finally to enable them to assume the responsibilities of their elders.
- (ii) Clashes between kinship groups within a section which are normally restricted to stick fighting and are often stopped by the joint action of the more responsible elements and by the efforts of the Spear Chief of the section who arbitrates between them and is backed by public opinion.
- (iii) Clashes between kinship groups of the different sections which may lead to a general clash between the latter and large numbers of the tribe may be involved. In such cases the sanctions derived from common residence and economic co-operation are clearly less effective and there is no articulate body of public opinion which expresses disapproval. It is at this stage that the major Chiefs of the Spear whose functions extend through the tribe come into operation. The family of GEFUR ALUR (Dendior) or of KWAL ARVOP (Pajok) represent those which operate on a tribal scale. All other Chiefs of the Spear operate on a sectional basis.

It will now be seen that the political structure of the Ngork is maintained in a number of different ways. In the first place the tribe is divided into divisions of considerable proportions, but these are not nowadays of any real political significance. These are further divided into sections and again into sub-sections. Such groups are essentially territorial in basis having a common name, common territory, common pastures and a strong sentiment of mutual co-operation. Each is in Dinka termed *wut*. Society is again divided into clans (*dhin*), but these are in no sense consistent with territorial groupings, for lineages (again called *dhin*) of most clans are resident in more than one section. Hence there are loyalties based on kinship affinity which cut across territorial divisions, and although a conflict of loyalties might arise, the existence of such extra-territorial links is a factor making for stability and peaceful relations between sections. Territorial sections are of greater reality to the Dinka than clan ties which extend beyond those sections, and sections as a whole are potentially hostile to one another. Again, within the section the potential opposition of different kinship groups is modified by a system

which classifies the population according to age ; an age-set system which is expressed in local nomenclature and does not extend beyond the limits of a section. Kinship loyalties are modified by loyalty to age-mates.

It is particularly interesting to note that the BONGO section is now united by age-set nomenclature which extends across all sub-sections, while names of previous age-sets are different in all four sub-sections :—

BONGO SECTION

Sub-section	KWAC	YOM	AWET	ADAR
	AYOORK	LITHLONG	KWANYJIGOK	AYIAL
	YIOU	KWACGORK	JONGLITH	AIYOU
	KIEC	GOC	TAIYARA	MALEK
	ANYAR	ANYAR	ANYAR	ANYAR

This common nomenclature of the junior age-set indicates a greater degree of integration than before, no doubt due to the recent cohesion brought about among the BONGO by administrative action. Age-set names are sometimes, though rarely, repeated in more than one section : the junior age-set of *DIIL* is also called *ANYAR* for example and there is a *JONGLITH* age-set in *MANUAR* equivalent to the *JONGLITH* of the BONGO AWET.

THE PROBLEM OF AUTHORITY :

THE FUNCTIONS OF THE *bany de ring*

We have seen that the Ngork are divided into a number of "sections" which have a considerable sense of corporate unity, have a common territory and grazing grounds and combine to resist infringement of their collective rights in land and cattle against other sections. In numbers, these groups vary from about 3800 persons (*MANUAR*) to about 1100 persons (*ACAK*). These sections are now regarded as administrative units placed under the authority of 'Section Chiefs'. Communal labour and other commitments, road-work, repair of Government buildings, the collection of taxes, are organized on this basis and each section is represented in the Court.

Scattered throughout all these sections are the main lineages of the *bany de ring* or Chiefs of the Spear. The most numerous are the *Dendior*,¹ the most important are the *Pajok*, while there is a third

¹ Their ancestor, *Gwel*, is said to have come across the river with *Aiwel* and emerged on the other side covered with grass. For this reason he was nicknamed *MYOK PIU*, "the man who milks the water." The clan is restricted to the *ACWENG* section.

clan called Pamyok Piu who also consider themselves Chiefs of the Spear, but are not of great importance.¹ All members of these clans are potentially Chiefs of the Spear but, as in the case of the Nuer ritual experts, all individual members do not practice as such. Moreover, among the Ngork it seems that in each lineage it is the eldest son of the direct line who should hold office and in some cases the eldest son of the senior wife. This strict rule of primogeniture² is not generally a Nilotic characteristic and is unknown to the Nuer.³

The Pajok clan are restricted to the sections of the AKOT Division of the tribe and are exogamous, while the Dendior have representative lineages in nearly all sections, are more numerous, and certain lineages of the clan are permitted to intermarry. The Pajok are all considered direct descendents of Kwal Dit,⁴ while the Dendior claim descent from Bakat Akonan⁵ himself a descendent of Longar, father of Aiwel Longar, the Dinka culture hero. In a sense the Dendior and Pajok are also a class. They are all *bany*⁶ and it is clear that they have special functions to perform in society, but they are not distinguished from the main body of the people by anything which approximates to social superiority in everyday contacts with other members of the tribe.⁷

The *bany de ring* have certain recognised functions to perform for their people. The principal one is that of arbitration between hostile parties within the groups, the composition of homicide cases and the settling of disputes which are too bitter to be composed by the elders concerned. The *bany de ring* is therefore a ritual expert who undoubtedly has political influence within the orbit of his own group and is expected to arbitrate between the members, but like the Nuer *kwar kwac* cannot impose his authority without the consent of the people. In this sense he represents the 'voice of the people' and articulates their wishes. He does not impose his authority; he is invited to arbitrate and by patient persuasion leads the disputants to reach a compromise. This attitude is still

1. Presumably *DHIEN* or *DHIN DIOR* — 'descendants of DIOR' though DIOR is not mentioned in their ancestral tree.

2. Discussed later in connection with the Pajok Clan.

3. Not among the Shilluk.

4. The genealogy given is: JOK — BULABEK — DONGBEK — KWAL DIT MOINY DANG — ALUR — BIONG — ARUOP — KWAL — DENG.

5. The Genealogy given is: LONGAR — JIL — JUIC — AKONAN — BAKAT — MATHIANG — AJNONG — AJING — ALUR — GEFUR.

6. cf. *mendior* and *kec* among the DUNJOL and PALOIC Dinka. I. Bedri. *S.N.R.* Vol. 29. Pt. 1.

7. *bany*, *beny*, *beng* — variously spelt, commonly translated as "Chief" (of the Spear), but more correctly as "ritual expert" and similar to *kwar* in Nuer.

apparent in the workings of any Dinka Court just as it is among the Nuer. The *bdny de ring* has, of course, ritual powers which strengthen and emphasise his function in society as a peace-maker. He articulates moral values inherent in the social system. He has the power to curse, but is not expected to use his powers to his own ends and certainly does not impose his authority by threat of a curse unless, in so doing, he is in fact representing the opinion of the more level-headed elements. His spear is his insignium of office and the material symbol which is handed from owner to successors. This function is carried out by the Dendior, in all sections of the tribe (Pamyok Piu excepted) except where they are superseded by the Pajok clan. The head of the Dendior clan, Gefur Alur, has influence nearly as great as the head of the Pajok clan, though today he is recognised as only second in importance in the Court. There is in fact a traditional division of function where arbitration is concerned. The Dendior are called in to deal with fatalities and injuries caused by sticks and clubs, while the Pajok arbitrate in disputes following fatalities and wounds caused by spears. This distinction is, I think, significant. Spears are not used in fighting except on a large scale where two hostile sections are involved. One is not expected to use spears against persons who are closely related by blood or closely associated in the social system. The distinction of functions indicates that the Dendior only arbitrate in localised incidents, while the Pajok can, theoretically, be called in when the dispute reaches a tribal scale. We are here really referring to the past, but the division of functions still operates in the sphere of ritual. Although cases of homicide are first settled in the Court, the actual payment of compensation (*puk*) by the kinsmen of the slayer to those of the deceased and the accompanying ceremonies are conducted by the Dendior in cases where the fatal blow is inflicted by a club or stick and by the Pajok when inflicted by a spear.

The Ngork have not been subjected to an intensive system of administration. Their country is practically inaccessible during the rains from May to November, the nearest point which can be reached by car during that period being at Muglad 130 miles away. As we have seen, at one time the Rueng Alor (now in the Upper Nile Province) were included in Western Kordofan district, but administration consisted mainly of occasional visits by the District Commissioner rarely totalling more than a few weeks in the year. For this reason, and because of their remoteness from any of the main lines of communication, the lack of a permanently navigable river and the absence of commercial enterprise by merchants from the north, the Ngork have been subjected to less external influences than most Nilotic tribes today. Moreover administration, essentially in the form of personal

visits from the District Commissioner, has for the most part been conducted by men who had relatively little experience of Nilotic peoples and did not speak the language.¹ This has had a definite result in the political organisation of the tribe. The principal *bany de ring* of the tribe has acquired powers which are undoubtedly greater than would have been the case in the past. An administration must in its initial stages demand some form of indigenous leader through whom orders may be transmitted. There was therefore an attempt to find some institution equivalent to the Baggara 'Nazirates'², or the 'Sultans' or 'Meks' of the Nuba and Daju of the District. One reads early reports which describe the most important *bany de ring*, as the 'Nazir,' 'Sultan' or even 'Mek' (King) of the Ngork.

The principles which characterise these institutionalised authorities among Baggara, Nuba and Daju in no way even approximate to the political functions of the Dinka *bany de ring*. Since, however, there has been an attempt to read a preconceived idea of a 'Chief' into the existing functionary himself, a Chief with considerable autocratic powers has been in the process of evolution over a number of years and if Kwal Aruop³ was not a Nazir to begin with, he soon became the Dinka equivalent. His son Deng Majok has carried the evolution a stage further and has a burning ambition to pattern himself on the Ali Gulla 'Nazirate' of the Homr (Baggara) with all the pomp of State visits to Khartoum, tribal gatherings, and in addition the Dinka ideal of wealth, a company of wives. There is no serious danger in this except that former administrative policy has tended to build up an effective autocracy in an essentially democratic society; a system which might ultimately prove a stumbling block to the introduction of a democratic system of Local Government. I do not wish to over-estimate this point. Clearly, the *bany de ring* had religious functions which gave him political authority out of the ordinary and, as will be seen later, such political power as is backed by the Government in the present system of administration was naturally accorded to the Chief of the Spear by the Ngork themselves and not only to the principal Pajok family, but also to the minor leaders who are in fact all Chiefs of the Spear, either of the Pajok clan or the Dendior. Without a wider knowledge of other Dinka tribes I have little basis of comparison, but I suspect that the main effects

¹ The Ngork have been included in an essentially Arab District and are now only about 8% of the total population of that District.

² *Nazir* — principal Sheikh.

³ The first recognised Government Chief.

of administrative policy among the Ngork have been on the role and status of the Chiefs of the Spear. The introduction of organised legal procedures with penal sanctions behind them, the administrative machinery for the enforcement of administrative obligations, not only in the execution of judgments, but also in collective tasks, is the main innovation and one which must have had a profound effect on political systems and political structure. It is the *bany de ring*, as chosen representatives of the Government, who supervise these things. In other respects the Ngork have been little affected.

THE PAJOK

The President of the Ngork Court is now Deng Majok of the main Pajok lineage, resident in the ABYOR section. The position of principal *bany de ring* has been held by this family for several generations and their history is essentially bound up with that of the Ngork tribe. We have seen that one Aiwel de Jok, together with his father, is said to have led the Ngork to their present country and that his nephew Adongbek or Kwal Dit was subsequently called over from the east to act as leader of the tribe. After the death of Aiwel, the position has been held in this line ever since and according to strict primogeniture, the office descending to the eldest son of the eldest wife in each case. Kwal Aruop was made President of the Ngork Court and leader of the tribe until he died in 1945. His death was followed by a dispute over the rights of succession, for he had two sons, Deng Majok and Deng Abot. In his latter days Kwal Aruop had fallen foul of the Government. In the words of a contemporary District Commissioner "His long period of power had corrupted his integrity and he had become a tyrannous old magician, grossly favouring his own ABYOR section to the detriment of the tribe as a whole. He was allowed to spend the rest of his days in his own land provided he did not interfere in tribal affairs." It is clear from this that the authority acquired by Kwal Aruop from his association with the Government had enabled him to impose his will on the Ngork, especially through the agency of an established tribal Court, in a way which would not have been tolerated in the past. His utterings were dictatorial, his judgments obviously biassed. Meanwhile the tribe was controlled by a triumvirate consisting of Kwal's two sons Deng Majok and Deng Abot and the leader of the Dendior, Gefur Alur. There is no doubt that despite his official retirement, Kwal Aruop continued to be a great influence throughout the tribe. In the meantime he had conceived an entirely unreasonable dislike for his son Deng Majok and clearly

hoped to establish the succession of his son Deng Abot instead, an appointment which was not in accordance with Government policy, since Deng Abot had proved himself the less able of the two brothers. On Kwal's death an attempt was made by a large fraction of the ABYOR to thrust the sacred spears into the hands of Deng Abot, which was considered by the administration to be tantamount to proclaiming him President of the Court. The events are described by the then District Commissioner, as follows :—

“ On his return from Kordofan in December '44 after the conferring on him of a robe of honour, Deng Majok was given a great welcome by his people. There was much singing and dancing and slaughtering of bulls. Old Kwal Aruop refused to congratulate his son or join in the celebrations. Deng Majok eventually called on his father, who refused to speak to him, gave him two fingers and then turned away. The snub was observed with satisfaction by the old man's household.

At the end of January '45 Kwal fell dangerously ill with stricture complications. On 7th February I reached Abyei and visited him in his hut which was closely surrounded by a large concourse of his own Abyor section to the exclusion of light and air. A brace of medical dressers were in attendance and their combined efforts had brought some relief. I had the crowd driven away and the old man got a night's sleep which rallied his strength, and when I left on the 10th there appeared every chance that he might partially recover.

In the meanwhile, I sensed an atmosphere of suppressed excitement. Deng Abot was unable to conceal it. So, before leaving, I summoned a meeting of the elders. They unanimously agreed that the magic spears were the insignia of kingship and could not be separated from the office of Chief, that when the tribe had accepted the leadership of Deng Majok three years before it was understood that the spears would come to him on the death of Kwal, and that if they were handed to Deng Abot the tribe would be hopelessly divided. The elders undertook to endeavour to persuade Kwal and his close relations, who were known to support him in his hopes to impose Deng Abot on the tribe, to see reason. They also expressed themselves willing to have it out with Deng Abot. Subsequent events have shown that their efforts were extremely feeble. Old Kwal was held in such awe that none of them dared to tackle him. He was also so well protected by a *junto* of his close relations that they could not get near him. Before I left Abyei I made it clear that the spear business was to be settled

once and for all after the Alal Dinka Meeting early in March.

I returned to the Abyei area on 1st March for the annual Dinka Meeting to be held this year on the Alal about 20 miles south of the Bahr el Arab. Kwal was still very sick, but there appeared to be no immediate danger that he would die. A fresh meeting with the elders was held and they confirmed their earlier opinion. It was decided that a deputation should go to have it out with Kwal Aruop. At the same time Deng Abot was categorically warned that he could not succeed to the magic spears, that it was bad luck on him, but that in the interest of the tribe as a whole there was no other solution.

That very night news was brought by a runner that Kwal was dying. Deng Abot woke me to tell me at 5 p.m. I agreed to send the two brothers off at dawn in my lorry. Deng Abot did not wait, but mounting a horse went for all he was worth back to Abyei. Deng Majok went by lorry at dawn.

About 2 p.m. on the 4th March Kwal died in the presence of the two brothers and most of the Abyor section. He was buried with all the ceremonial of a Ngork Chief, though fortunately not alive, like his grandfather Biong. The Abyor were the only section present and when they had filled in the grave they began the ritual dances. The two brothers sat side by side on the ground. After a while a party with Kwal's close relations at their head came and lifted Deng Abot, who at first made a faint show of resistance, twice into the air and then placed him on an *angarib*. They then heaped on him all the insignia of Kwal's office, bracelets of iron, a crown of cowrie shells, necklaces of blue beads and what not, and the magic spears were given him.

Meanwhile Deng Majok sat in his place forgotten in the general excitement. Bye and bye braver spirits began to taunt him and when he got up to go to the river to wash he was mocked with running away.

My lorry as usual breaking down, I did not get to Abyei until the morning of the 5th March. I visited Kwal's grave and found about three hundred of the Abyor section assembled there but no one else. I told them nothing except that I would hold a tribal meeting on the morrow. On returning to Abyei Post I spent the rest of the day finding out the true state of affairs and making a plan of action.

I soon became convinced that the whole plot was a manoeuvre by Kwal's brothers and other near relations to secure the succession of Deng Abot who would serve their interests as Kwal had done. For since the succession of Deng Majok, the Abyor had not had it all their own way and this they bitterly resented. The *coup d'etat* had been

rushed through because it was known that if the matter was referred to the whole tribe they would not get away with it. They hoped that by presenting a *fait accompli*, the tribe would abide by it through fear and that Government would not interfere in a matter of tribal custom.

They were unable satisfactorily to explain why they had rushed the business through. They excused themselves by saying that other sections of the tribe had not turned up, so they had proceeded on their own.

At 11 a.m. a meeting was held of all Ngork sectional leaders, the two Dengs not at first being present. Eight spokesmen from the Abyor section came to present their case. The meeting was extremely orderly, typical of such Nilotic proceedings. It was clear from the outset that public opinion was whole heartedly against the Abyor section. Briefly the points made by the elders were :—

- (1) At the 1942 meeting when Kwal was allowed to retire and Deng Majok chosen to succeed him, it had been clearly understood that Kwal could only keep his spears during his lifetime as an act of grace, and that they must be handed to Deng Majok, at his death.
- (2) The spears had been inseparable from Ngork Chieftainship and there was now no reason to tamper with this accepted tribal custom.
- (3) They were very satisfied with Deng Majok and to go back on the 1942 agreement would hopelessly divide the tribe.
- (4) They pointed out that other sections of the tribe, had not turned up at Kwal's funeral to perform the customary rites because he was no longer Chief. The Abyor spokesmen were clearly hard put to it to make a defence and lamely averred that they would not go back on what they had done as it would bring death and calamity on the tribe.

By 4.30 p.m. a point in the discussion had been reached at which the elders demanded that representatives from the Abyor section should go and get the sacred spears and hand them over to Deng Majok, and that in two days time the tribe would assemble and perform the full rites. The Abyor spokesmen refused to go and get them, fearing terrible consequences, if they should go back on their previous action.

I then stepped in with a short summary of the main facts and stated that it was quite clearly the wish of the tribe as a whole that the spears should go to Deng Majok. I gave the Abyor section a short interlude in which to decide whether they would fetch the magic spears

voluntarily, but if they refused to deliver them, that I would get them myself. As I had clearly guessed, this called their bluff, and Mahdi Aruop, one of Kwal's brothers, volunteered to fetch them. An hour later he returned with them and they were handed over to Deng Majok."¹

The action taken over this matter has been criticised in other Dinka areas on the grounds that it is not essential that a Government "Chief" should also hold the sacred spears. This is not disputed, but the controversy among the Ngork themselves is not so much whether the President of their Court, itself clearly an alien institution, cannot carry out his duties as leader of the tribe without the sacred spears, but which of the two sons of Kwal Aruop is the true successor to their father's ritual status. There is, in fact considerable doubt and the Ngork themselves do not know. Some say that succession must be from eldest son to eldest son of the senior, that is, first married wife. Others say that the matter rests with the dying father and that his will must be obeyed and point out that the tribal hero, Kwal Dit, was not an eldest son. If this is the rule, then Deng Abot was certainly favoured by his father in his later days. If primogeniture is the rule, then the position is still ambiguous because no one is quite certain which of the two, Majok or Deng Abot is the son of the senior wife, though it is known that Deng Majok was born first.

Aruop, father of Kwal, had two sons—the eldest of which was Koijanum. This son died as a youth. Later, when Kwal grew up, according to Dinka custom it was incumbent on him to marry a "ghost-wife"² to Koijanum with the cattle which would normally have been the latter's inheritance. He therefore married a girl called Nyan Ghar Kit of the DIIL section, but she refused to live with him and his cattle were returned, all except one. Kwal then married Abiong Malek, of the ALEI section, with these same cattle. Meanwhile Nyan Ghar had been persuaded to change her mind and therefore Kwal remarried her, using this time his own cattle. Because there remained one cow of Koijanum's in Kwal's marriage to Nyan Ghar, the question as to whether she was Kwal's wife or Koijanum's arose. A ritual test was performed in the presence of all, including Aruop himself, and after slaughtering a white goat, it was agreed that Nyan Ghar was Kwal's wife and the senior, while Abiong was Koijanum's. Both women conceived by Kwal and before giving birth, the sacred fighting spear was placed against Abiong's hut so that she might produce a girl child, while the fish-spear was leant against Nyan Ghar's hut in order that she might produce

¹ Unpublished Government Report by Mr. J.W. Scamer,

² See "Ghost-Marriage" — p284

a male child to be Kwal's successor. This came to pass and Abiong bore a girl, while Nyan Ghar bore a boy who is Deng Majok. Later Abiong bore Deng Abot and after him Nyok. It must be understood that although Kwal was *genitor* and guardian of Deng Abot and would in normal usage be referred to as his father, he is not the *Pater* or legal father at all. Deng Abot is the legal son of Koijanum. The argument therefore becomes very involved. Although Deng Majok's mother must be considered Kwal's eldest wife (since Abiong was not his wife at all), it is quite possible for him to claim that Koijanum was Kwal's eldest brother and therefore his heirs could claim to succeed Kwal. Ultimately, I think, the matter would have rested with Kwal's own word, though this is a personal opinion. It would seem that at first he favoured Deng Majok—but latterly came to prefer Deng Abot.

The genealogical picture can be expressed as diagram opposite

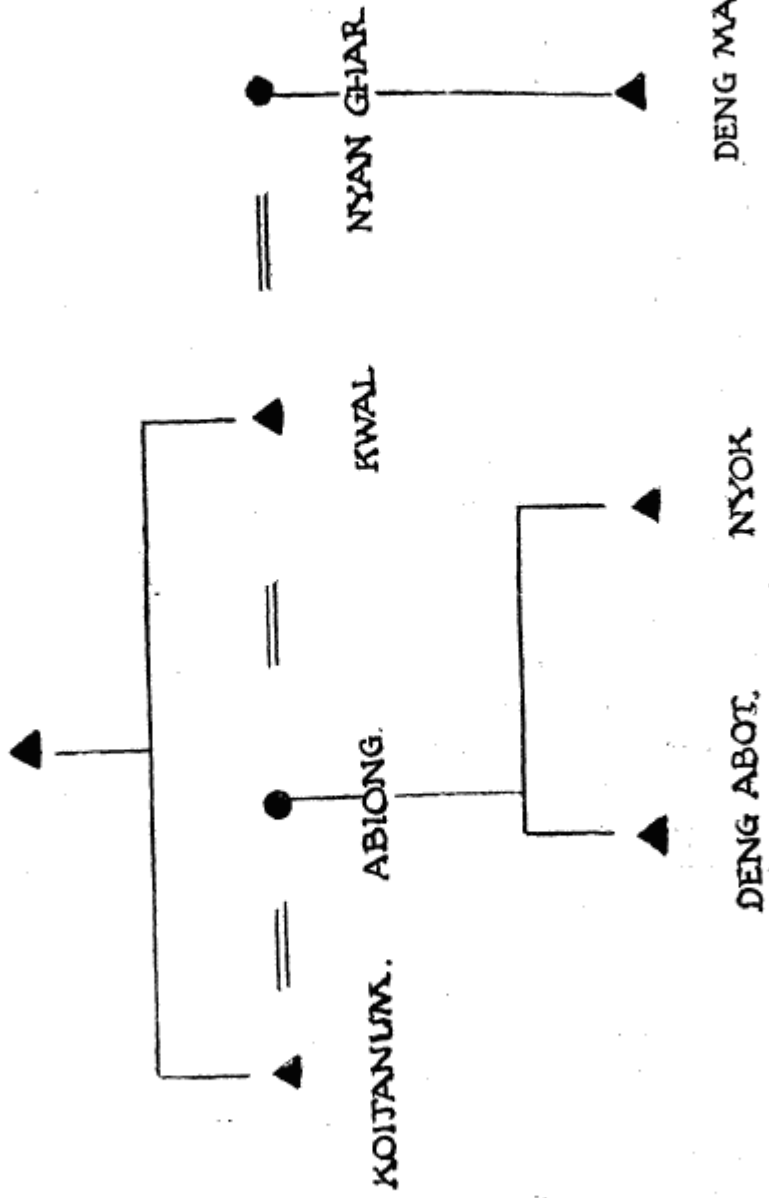
It is difficult to say what would have been the result if there had been no Government intervention (or if there had been no Government at all). It is probable that Kwal's decision in favour of Deng Abot would have been respected. Nevertheless, Deng Majok certainly has an equal claim, if not a better one, and I do not think his position will be further disputed (except by some of the Pajok leaders and Deng Abot himself) unless he makes himself generally unpopular. His position and the fact and theory behind this problem of succession have been mentioned here in some detail because light is thrown thereby on the whole question of the status and function of this lineage in Ngork Dinka country.

It is clear that the Pajok family are of paramount importance in the tribe and have been for several generations, and it seems too that they have acquired these powers comparatively recently in tribal history; tradition states that the privilege of leadership was accorded to Kwal Dit by the Dendior, and this leads me to believe that they have acquired their position by the interaction of a number of factors operative on Ngork society in the course of the last century or so :

- (1) The tradition of astonishing magical powers attributed to their ancestors Aiwel and Kwal Dit.
- (2) The potential threat from Arab slavers from the north and Nuer tribes from the south-east which necessitated a high degree of tribal co-ordination in the face of opposition and therefore a tribal leader as the focus of opposition.

This has now been intensified by the acceptance of the Pajok family by the Government and perhaps in the exaggeration of their political functions by the need of that Government to find an established authority to

ARUOB



act as its representative. This works both ways. To the Dinka, the imposition of ordered administration is also a threat to which a reaction of opposition is the natural outcome. A political filter between an alien Government and the people is required, so that a degree of autocratic authority is accepted from the person chosen to be the "filter." This is characteristic of the relations between Government and the people of all Nilotic tribes whose indigenous political system is essentially a democratic one. A degree of autocracy is tolerated from someone who acts as a convenient buffer between themselves and something which is even more autocratic. This is to diagnose only one aspect of the Nilotic attitude towards authority, but it is an important aspect.

There is a tradition among the Ngork that in the old days the *bany de ring* of the Pajok were buried alive when they reached the end of their days. This throws further light on their ritual status in the tribe. Biong, grandfather of Deng Majok, was so buried according to Ngork tradition. There is evidence also that the life of the principal *bany de ring* is considered intimately associated with the welfare of his people.¹ It will be noted that in the account of the accession of Deng Majok and the controversy which followed the author says "they would not go back on what they had done as it would bring death and calamity on the tribe." They (the pro-Deng Abot party) were clearly bound by the obvious fear that a false step in the transference of the spears would bring disaster to the Ngork.

I do not wish either to exaggerate or underestimate the importance of the Chiefs of the Spear. Clearly their position has been much enhanced by the executive authority accorded to them by the Government and upheld by the threat of penal action. It is, however, important to note that in nearly all sections of the Ngork tribe, and in many of the sub-sections, there is not only a representative of either the Dendior or the Pajok clans in existence, but that he is invariably chosen by the people themselves to represent their interests in the Court established by the Government.² The choice in this matter is theirs, not that of the District Commissioner, for in Western Kordofan district the latter has had neither the time nor the

¹ See Seligman — *Pagan Tribes of the Nilotic Sudan* 1932 and *Egypt and Negro Africa* 1934, etc.

² It must be remembered that the Court is not only a Court of Law, but also a unit of administration responsible for all matters in which the Government has a hand. There was, at the time, no separation of the judiciary from the executive.

knowledge to make these selections himself.¹ It is therefore significant that they should chose the Chiefs of the Spear to act as arbitrators in their disputes now settled in the Court, which is certainly an alien institution, but none the less an essential feature of Ngork society today. The Pajok clan appear to be the dominant one within the tribe as a whole and its most important member, who holds his position according to the strictest of hereditary rules, that of primogeniture, is responsible for dealing with disputes on a tribal scale. The Dendior clan which is highly segmented and has representatives in nearly all sections is responsible for disputes on a sectional scale.² We may conclude that the Chief of the Spear, on any scale and whatever the extent of his influence, although he had no executive authority in the past with the power of compulsion behind it, had, to varying degrees, considerable influence as arbitrator in affairs likely to cause political friction, and perhaps more influence than the Leopard-Skin Chief among the Nuer. Among both these people these functionaries were essentially arbitrators, both had religious sanctions behind them, both had what may be called a respectable status well founded on tradition. Yet, with both, the effectiveness of their powers depended largely on other sanctions prevailing ; the actual need for co-ordination in the face of external aggression ; the need for integration because the lack of external security was a threat to the very continuance of social and economic existence. That these sanctions must have varied according to historical circumstance is abundantly clear.

Whether these observations can be extended beyond the Ngork Dinka to the Dinka as a whole is a problem which must await further investigation. Throughout both published literature and, naturally enough, Government reports and correspondence, there are references to these functionaries, but we are not yet able to estimate the accuracy of the statements made, nor whether a right interpretation has been given of their political importance. Throughout the history of the administration there has always been a tendency to seek for rulers where no such rulers exist and by doing so to create them. In the early stages of administration this is a matter of expediency and this observation is made not as a criticism of Government

¹ The procedure is simply for the District Commissioner to ask the section concerned to choose its leader and after considerable public argument of a highly democratic nature, a leader is thus chosen. Although the District Commissioner may exercise his power of veto if a candidate is put forward who is known to be undesirable, this rarely happens.

² With the exception of the lineage of Longar of which Gefur Alur is the leading representative. There are in fact traces of traditional rivalry here, though, as we have seen, the functions are distinct.

policy, as to point out how difficult it is to judge now what were the true functions, the true status and the true position in society of these persons. What evidence exists indicates that the Dinka Chiefs of the Spear, at any rate those who operated on a tribal scale, had a greater religious importance and we may perhaps infer that as a result they had a greater political influence than the Nuer Leopard-Skin Chief.¹ Whether this was so or not, there is no evidence that either of these functionaries were authorities who had the force of "politically organized society" behind them. Moreover, the customary law to which they referred during the process of arbitration was essentially private law.

CUSTOMARY LAW.

By 'Customary Law' is meant the body of 'Native Law and Custom' nowadays administered in the Court under the Chiefs' Courts Ordinance of 1931. Such expressions are themselves something of an anomaly if any strict definition of the term 'Law' is applied, but they are sufficient to indicate generally those customary rules governing human relationships which in the past were subject to sanctions too indeterminate to be called legal, but which are now applied in the courts with the consistency and organized force sufficient to turn them into 'law' in a more exact sense. Ngork Dinka law was essentially Private Law subject to retaliatory or restitutive sanctions. Social aberrations and disputes were settled by the intervention of the elders and in more serious cases by the mediation of the *bany de ring*. This does not, however, mean that there were anything in the nature of organized tribunals nor that all disputes were settled amicably. Nowadays such disputes are brought before the Court established by the Government. Penal sanctions are now applied to offences which in the past were in no sense criminal, for punishment is a concept entirely alien to the Ngork. Further, the scales of indemnities for wrongs have now acquired a certain rigidity unknown in the past. The Law now administered is at basis derived from customary procedures in which arbitration

¹ The fact that the Chiefs of the Spear—those of tribal rather than sectional importance—have a special association with the welfare of the tribe as a whole, and that their physical condition must not be impaired, is evidence of their religious importance. There are many references in literature to the custom of 'killing' the Chief of the Spear before he expires naturally. This is a fact, not a mere tradition, as was demonstrated recently among the Paloic Dinka.

and compromise prevailed and has evolved from processes of case law derived from precedents established in Court. The account which follows, by no means complete, covers most of the situations which are dealt with by the Ngork today.

The Ngork Dinka have only one Chiefs' Court and in this they suffer a disadvantage. In administrative isolation from the main body of the Dinka further south and south-east, appeals against its judgment are not seen by a panel of neutral chiefs formed into an Appeal Court, a sound practice which is followed elsewhere.

Homicide and Bodily Injuries.

We have seen that hostilities between various units of Ngork society were common in the past and often resulted in homicide. The institutionalised fighting called *bioork* between age-sets rarely led to fatalities and usually concerned only one *wut* or section. Other kinds of fighting, internal to a section, concerned only the members of two lineages, though others might join in, usually along the line of kinship cleavage. Finally there were frequent fights between sections and often feuds which might last over a very considerable period. Sometimes, too, there was a combination of two or more sections on one side against two or more on another. Such feuds do not appear to have followed any traditional combination of sections nor the lines of what we have called the divisions or main divisions of the Ngork tribe, but took place according to the spirit of the moment.

The basic obligation to avenge follows the lines of kinship, but may sometimes extend to people bound by ties other than kinship. For this reason a whole section might remain potentially hostile to another section irrespective of kinship relations of the participants. If, however, a blood-feud is settled by payment of blood-money, it is not incumbent upon all members of the section to assist, but only on persons who can trace actual relationship to the killer in the paternal line, more rarely in the maternal line and sometimes through direct intermarriage. For this reason the obligation to avenge is not necessarily co-extensive with the obligation to assist in the payment of blood-money.

The concept of "Ghost-Marriage" is found among the Ngork Dinka as among other Dinka tribes and among the Nuer, and "Ghost-Marriage" is a fundamental obligation of kinship. To the Dinka, as well as the Nuer, the main purpose of 'blood-money' (*puk*), which is paid in cattle, is to provide bridewealth with which to marry a "Ghost Wife" to the dead man. Hence, in theory at any rate, the rate of blood-money in cattle should be approximately equal to the average bridewealth. In fact 'blood-money'

among the Ngork is fixed at twenty head of cattle, while bridewealth is on average about thirty. This disparity may be due to some agreement reached in Government times, although the Ngork themselves say that it was always so. Bridewealth among the Dinka and Nuer peoples always tends to vary with economic conditions. It will automatically drop after a serious epidemic and in the past blood-money may have varied too, but the latter has tended to be fixed by Government action and by consistent application.

It must be remembered that in the past there was no conception of individual punishment inflicted upon the person of the killer because there was no organized authority with penal sanctions behind it in existence. An act of homicide requires the restoration of equilibrium between the groups involved and this can be done only by pursuance of a feud, and by killing either the killer himself or one of his male kinsmen. In fact any reaction of indignation is restricted to the dead man's kin alone and demands revenge on the person of the killer or any of his agnatic kinsmen. Neighbours of one party or the other may, of course, join in to assist, with the result that hostilities are by no means confined to the kinsmen of the killer and his victim, but may involve the members of whole sections.

The more positive way of dealing with the situation is to pay the recognized 'blood-money' to the family of the deceased. The Ngork themselves suggest that feuds on a large scale were not often settled in this manner, but those between local lineages or groups were rarely sustained for long and were usually composed by the payment of compensation. This is only another way of saying that the main sanction for composition of a feud was expediency, in the sense that it was both inconvenient and dangerous to live in enmity with one's immediate neighbours. Their good will was needed and often their assistance in resisting external aggression. Hence it can generally be assumed that the closer the relationship of the parties concerned, both in the social structure and in territorial association, the more likely that a dispute of this sort would be peacefully settled. In other words the sanctions for amicable settlement were relative to the social relationships of the two groups involved. Should these sanctions be strong enough to enforce a settlement, the mechanism by which such settlement was achieved was always available in the person of the *bany de ring*. There is clearly an inherent wish to come to terms, for feuds can only lead to social disintegration and in view of opposition from Arabs in the north and Nuer and other Dinka tribes in the south, a high degree of political co-ordination must always have been necessary.

We have seen that the *bany de ring* had no executive authority backed by organized legal sanctions. He was simply the 'focus' of public

opinion and was able to operate only when the situation was such that his activities as a mediator were both expedient, convenient and in demand. It is true that a *bany de ring*, like the Nuer Leopard-Skin Chief, can draw a line in the ground between the warring parties with his spear, across which they dare not pass. This merely means that actual hostilities are unlikely to take place in the presence of a *bany de ring*, but does not prevent the parties from continuing hostilities later.

Procedure in Blood Feuds

When A kills B a state of feud arises automatically between A's kinsmen and B's kinsmen. A must first undergo personal ceremonies of atonement which are carried out secretly by his own kinsmen (not by the *bany de ring*.) This ceremony is known as *cuil*. A sacrifice is made and the killer's shoulder is scratched with a fish spear so that blood flows, essentially an act of spiritual purification. As among the Nuer, the kinsmen of the killer and those of the dead man are not allowed to partake of food together. To do so would cause spiritual contamination in the form of physical disease which might well lead to death. This taboo on eating together continues until final settlement has been reached and often long afterwards. The services of the *bany de ring* are then sought. He goes off to B's kinsmen, spears a bull as a sacrifice (*mior de kweng*) and calls upon them to take the oath (*kweng*) to keep the peace and take no vengeance.

Cattle are then collected by A's kinsmen and handed over to the *bany de ring*. These cattle (*puk*) are twenty in number and consist of eighteen cows and two bulls. On the appointed day the two parties assemble and the *bany de ring* sacrifices one of the bulls—the *mior de yuom* ('the bull of of the splitting'.) He then takes the bones of the right hand legs of the beast, splits them in two and throws one half to the killer's party, the other half to the relatives of the deceased. The *bany de ring* takes one cow as his fees, the *weng de riem* (the cow of the blood), the rest being handed to the deceased's brother or son or other legal heir. It is usual among the Ngork to keep the compensation cattle as a herd for two or three years until they have increased.¹ Twenty or more are then used to marry a 'Ghost-Wife' (*ting de koic*) in the name of the dead man, while the remainder are distributed among his relatives, although the Ngork can quote no conventional distribution.

¹ This may account for any disparity between 'blood-money' and bridewealth

In cases where an unconfessed killing occurs, the *bany de ring* may put all parties concerned on oath (*kweng*). Should the killer himself take such an oath of innocence, it is believed that he will die. His offence is a serious one because unless the killer is known, his relatives may inadvertently partake of food with those of the deceased and call upon themselves the consequences. For this reason alone, the killer usually confesses without delay and in any case he must perform the ceremony of blood-letting (*cuil*) with some of his kinsmen present.

In straightforward cases in which spears are used, the man who inflicts the first wound, however trivial, must pay the compensation in full. He is known as *ran aci kiet*, the 'first spearer' as opposed to the *ran aci ber*, the 'second spearer.' For this reason it sometimes happens that a man sentenced to death or imprisonment for culpable homicide under the Sudan Penal Code may be different from the man who pays compensation. This obviously rarely arises because (under the Penal Code) in many cases of the sort, both would be convicted of a joint act in pursuance of the common intention of all. In cases where sticks are used and a man lingers on for a while between life and death and then dies, all persons who inflicted wounds are held equally responsible. In theory, since the main object of payment of blood-money is to restore the balance between the two opposed groups and to marry a wife to the dead man, full compensation should be paid whatever the circumstances and whatever the intention of the killer. In fact the Ngork Dinka, like other Nilotics, do make a distinction.

In cases where a man dies fairly soon after the infliction of his injuries, full compensation is paid, but if he lingers on, partially recovers and then has a relapse and dies perhaps after several years, only six head of cattle are demanded, provided at the time of the incident the guilty party has paid a form of insurance — *atiol* (a sheep) and *niem* (a cow-calf). If this has not been paid, half the traditional compensation rate (ten head of cattle) is demanded and known as '*tok ther aci cak*'. Accidental killing, known in Dinka as *waic*, demands only six head of cattle as compensation.

There is no distinction in the number of cattle paid in compensation for the death of women or uninitiated boys, but since a man has already paid bridewealth for his wife, he will not be expected to pay full compensation if he kills her, though he will be expected to pay something to her kinsmen to re-establish peaceful relations with them. These cattle — usually only two or three — are known as *ghok riem*. Similarly if a man kills a close agnatic kinsman he will not be expected to pay more than

ghok riem. Indeed, in such circumstances, if full compensation were paid, those persons who normally assist in the collection of blood-money would also be the recipients. If a woman kills someone, her legal husband will be held responsible, although her own kinsmen may be expected to assist him in the provision of compensation cattle.

The main principles which emerge from this very brief account of homicide among the Ngork Dinka are clear. In the first place homicide is essentially a private delict requiring restoration of the equilibrium. Relatiatory sanctions are operative since the first obligation of the kinsmen of the dead man is to take vengeance upon the killer or upon one of his kinsmen. Since, however, the continuance of a feud is often not only dangerous but precludes to freedom of movement and the pursuance of everyday life and is therefore intolerable, a system exists whereby the feud may be amicably composed. The balance is restored and future hostility avoided by payment of compensation (*puk*), the object of which is to marry a Ghost-Wife (*ting de koic*) and thereby assure the continuance of the dead man's line in posterity and the future of his kinship group, thus appeasing the reaction of indignation which his kindred are bound to display. Retaliation is replaced by a system of indemnity which is effective according to the prevailing relations within the group concerned and generally speaking this is relative to their position in the social structure.

The killer is believed to be in a condition of ritual impurity, and between the killer's group and the dead man's group there arises a condition of spiritual danger expressed in a prohibition on eating and drinking together and indeed on any form of social intercourse. These difficulties are removed by a series of ritual processes conducted by the Dinka *bany de ring* who is also called upon to conduct the precarious negotiations over the payment of compensation. He is the mediator, but he is in no sense the executive representative of organized authority and cannot compel the people to come to an agreement even though he has spiritual powers in the form of a curse. These he may be expected to use in a conventional manner as the spokesman of a general moral sentiment which condemns the killing of kinsmen, however remote, and also of neighbours.

We may sum up by saying that the Ngork Dinka, and possibly all Dinka, treat homicide as a private delict in which the groups of the killer and the slain are ranged against each other and that the matter may or may not be composed by the payment of an indemnity. This indemnity, since it has as its primary object the 'marrying of a wife' to the dead man, thus assuring the continuity of his group, is theoretically the same whatever the motives of the killer or the circumstances of the incident, but an actual

compromise which springs from these distinctions has usually been reached. Moreover in the past the actual relationship and status of the persons involved not only conditioned the possibility of peaceful settlement or otherwise, but also the number of cattle acceptable. The form of compromise, reached in each of these circumstances, has now a considerable rigidity owing to consistent application in the Courts.

Hurt.

Among the Ngork there are traditional rates of compensation for various forms of physical injury. These are clearly not part of a rigid code, but serve at least as a basis for compromise between the parties concerned, for the real test, based on the logical principles of equilibrium mentioned above, is the actual physical effect on the injured party. Nowadays, the Court is inclined to refer blindly to established rates of compensation, but in the argument which follows, they will find out how the injuries have affected the victim as an economic asset in his family group, how much he has become a mere liability to them, how much his fighting powers are impaired and so on.

I do not propose to digress further on this particular aspect of Dinka law. There is plenty of recorded, though unpublished, evidence throughout Dinkaland that similar customary scales, though variable in extent, are referred to as a basis for compromise in disputes. O'Sullivan says "all bodily injuries are compensated by cattle," and again "injury compensation must be made formally" and "the peace sacrifice must be made, the offender supplying the bull or the number of sheep required, both parties making a feast and dividing the meat equally."¹

It is clear that bodily injuries less than death are treated as private delicts and composed by a system of indemnity, the indemnity being paid in reference to definite scales recognised in the past as customary. That these scales had no exactitude of application in the past, but have now, in some areas at any rate, acquired a certain rigidity due to consistent enforcement by the Courts and have therefore become precedents, in no way alters this argument².

Marriage and Marriage Laws.

The next aspect of Customary Law among the Ngork Dinka, includes marriage, legitimacy of children, divorce and finally the violation of rights

¹ O'Sullivan Capt H.D., "Dinka Laws and Customs." *J.R.A.I.* 40, 1910.

² See also O'Sullivan. "Dinka Laws and Customs" *Man.* Vol. 40. 1910.

in women. This entails a summary account of the main essentials of the kinship system. We have already seen that the clan, which is usually an exogamous unit, is dispersed throughout the territorial sections of the tribe. The members of the local lineages of these clans within one section are more closely related to one another in the kinship structure and can usually trace their descent from an ancestor more recent than the founder of the clan as a whole. The inter-relationships of lineage members are maintained by a reciprocal system of bridewealth distribution and the obligation to assist in the collection of bridewealth, and, as we have seen, a common duty to avenge in cases of homicide, or in the collection of the cattle of indemnity, though this duty appears to extend beyond the limits of collective rights and duties in matrimonial affairs.

Bridewealth payments among the Ngork Dinka vary considerably, not only according to the increase or decrease of the cattle population, but also according to the social and political importance of the bride's family. This variation, however, is not due to any formal gradation according to social status, but merely to the fact that a man is usually willing to pay more bridewealth for a woman who comes from an important and influential family. In paying bridewealth a man gains not only a wife and eventually children, which is the primary objective of marriage, but also the privileges and other advantages which alliance with her family will bring. A man may hand over as many as forty, fifty or even a hundred head of cattle for the daughter of an important man, but the average appears to be between twenty-five and thirty. This is on the whole higher than the Nuer average, but we must bear in mind that the Ngork have a definite system of what I have called "reverse payments"¹ so that in paying a large number of cattle, he may expect eventually to get at least a third of that number in return².

A man will collect the cattle required for bridewealth from those of his father's herd which, by his position in the family, by inheritance and the rules of distribution, are his right. He will also do so from paternal relatives, maternal relatives and even relatives-in-law.³ Further, it is an accepted principle that brothers should marry in strict order of seniority of age, though the status of the mother, as first wife or second wife and so on, is often an important factor.

¹ Reverse payments. See page 287 Called in Dinka *arueth* or *arweth*.

² In numbers only and not necessarily the same cattle.

³ The cattle called *akoiny* from his brother-in-law. This is discussed later *Akoiny* also comes to mean merely 'outstanding' as in a debt.

The Social and Ritual Process of Marriage.

Dinka girls are sometimes betrothed when quite young, though this is not a general rule. This is called *amac* (betrothal : *ce nya mac koh*) and a few cattle are sometimes handed over as surety, but later included in the bridewealth. A man will meet his bride at the usual social dances and the flirtation parties which follow, but he will also probably make private overtures to the bride's family beforehand to see whether he is an acceptable suitor. A party consisting of himself, his father or elder brother and one or two other men of his immediate family then go to the bride's family to make the first official overtures. The bride's family will entertain them and a sheep or goat will be sacrificed and eaten. This procedure is called *athoic* and it is considered proper that the bridegroom himself should remain in the background, for at this stage it is held that only the elders are concerned. It is essentially a private affair between the two immediate families involved and guests are not invited, but is a meeting which is carried out with considerable ceremony and with a high regard for the etiquette of such occasions. The main object is to find out whether there is any possible bar to marriage through common descent and to discuss the approximate number of cattle to be paid. At these and later negotiations, the bride is represented by her *nyal thoude* — a girl of her lineage, and the bridegroom by his 'Best man' or *thut*. These assistants are principally concerned with the relations of bride and bridegroom and not with legal negotiations.

Shortly after this another meeting takes place known as the *kweth athiek* in which a wider circle of relatives are concerned and discussions reach a more formal stage. Genealogical trees of both families are quoted publicly so that anyone knowing of kinship relationship between the couple, which would be a bar to marriage, can speak his mind. A sacrifice is made and part of the bridewealth may be handed over. The young men are present for the dancing, but again the legal negotiations are restricted to the elders.

The third ceremony is called *kwen athiek* and is attended by a large number of people of all ages including wedding guests. Feasting and dancing takes place and beer and meat is provided for them all. There are further negotiations over the number of cattle to be paid and a few more cattle may be actually handed over.

The final ceremony is called *thok de thiek*¹ and the remaining cattle are handed over. The bride herself is handed to her husband and

¹ *Thiek* means literally "Marriage," — There are therefore the *kweth athiek*, "the negotiations of marriage," the *kwen athiek*, "the counting of marriage" e.g. cattle negotiations and the *thok de thiek*, the "completion of marriage" e.g. confirmation.

after he has made a suitable sacrifice, (*mior de thiek*),¹ returns with him to his home. Either then or very shortly afterwards the bride's family will hand over the *arweth* cattle to the bridegroom. These 'reverse payments' are in numbers approximately one third of the total cattle paid by the bridegroom. Among the Ngork therefore, the marriage is confirmed by the payment of cattle on both sides. The bride may then proceed to her husband's home. As among most Nilotics, a wife always goes home to give birth to her first child, and it is usual for the husband to provide a cow in milk to feed her during this period, though the cow may subsequently be returned to him.

Bridewealth affirms the legality of Dinka marriages. It implies a material symbol which legalises the union of man and woman and above all establishes the legitimacy of children and their lawful inheritance. The bridewealth is not a payment in the sense of a commercial transaction as is abundantly illustrated by the payment of *arweth* by the bride's family to the bridegroom. In addition there are, contained in the institution of bridewealth, certain important factors which may be summarized briefly as follows :—

- (i) An emphasis on the convention and patterns of behaviour and reciprocal obligations which are raised between the kinship groups concerned in the marriage and which must be observed if the union is to be a successful one.
- (ii) An attempt to ensure stability of union, particularly in the initial stages when marriage has not been confirmed by the birth of children.
- (iii) Religious concepts are involved. The interest of ancestral spirits is invoked. Cattle represent symbols of continuity and ancestral spirits are therefore thought to be interested in cattle exchanges and will bless the union.
- (iv) A legal indemnity for the loss of the woman's services to her own family and kin, particularly her domestic and economic services and also as compensation for services rendered in bringing the bride up.
- (v) In an exogamous patrilineal society a woman cannot bear children to her own kinsmen. Her bridewealth provides them with the means to marry a woman outside their own lineage and to raise children to their own name. The social equilibrium is thus maintained, the patrilineal identity of the lineage continued and its continuity in posterity assured.

¹ "The ox of the marriage."

Forms of Marriage.

The Ngork Dinka, like most Nilotic tribes, attach great importance to continuity in the lineage. A man's life, both in this world and the next, is not fulfilled unless he has children who will carry on his line. This is clear when we come to consider the various forms of marital union possible in Dinka society.

(i) Normal Marriage : (' Simple legal marriage '). Between a man and a woman, achieved as we have seen through the performance of recognized rites and social processes, confirmed by the transference of bride wealth cattle (*ghok thiek*) by the husband to his wife's family and equally the payment of cattle (*arweth*) by the bride's family to her husband. Such a union is further confirmed and stabilized by the birth of children who take their father's name and are legally his heirs, but form also a real link with the mother's kinsmen because the fact of relationship on the maternal side is not ignored and indeed carries with it certain legal implications as well.

(ii) Ghost-Marriage. (*koic*). If a man dies without issue, it is incumbent on one of his male kinsmen to marry a wife to his name with the cattle available. The marriage is a legal reality although he is dead and any children born to the woman are legally his and entitled to legal rights through him. Their relationships with other persons are traced through him, for he represents a known point in the lineage structure. The kinsman who marries the woman to his name acts as father to the children in every sense but the legal. In legal terminology it can be said that the dead man is *pater* while the pro-husband is *genitor* and foster-father.

(iii) The Levirate. It is usual for a man to take on his brother's widow to raise children to the latter's name ' *caci la ghut ting de mene.*' There is no question of remarriage and no bridewealth cattle are returned or paid again. Legally the woman is still the wife of the dead brother whose legal rights are unalienable except by dissolution of the union and the return of bridewealth cattle. He is still *pater*; any children born subsequently are legally his issue, although his brother is *genitor*. The legal principles involved in the levirate and in ghost marriages are not different. The actual difference is that in the ghost-marriage system, the union is made subsequent to the husband's death and the ceremonies of marriage are carried out by the dead man's brother (or other kinsman), while in the levirate the union is already in existence and simply carried on without further ceremonial or payment of bridewealth by the dead man's brother or kinsman as " pro-husband." In some cases a more remote kinsman, sometimes even a maternal kinsman, will perform

the functions of the brother within the meaning of this definition of the levirate.

(iv) Widow Concubinage. Sometimes a widow may be allowed to live with a lover of her own choice who acts as pro-husband, but is, of course, never legal husband of the woman or *pater* of her children, nor even legal representative of the dead man.

(v) Unmarried Concubines. Finally in rare cases, a woman of independent and wandering temperament may live with a man without payment of bridewealth. This usually happens when a woman has been divorced so many times that her family despair of a stable and legal marriage, have no hope of anyone paying the bridewealth and hope to get what they can from her lover. This is really not marriage at all and certainly not a legal union. Her lover is in no sense *pater* of the children upon whom he has no claim unless he pays special legitimization fees for each.

The Distribution of Bridewealth.

We have seen that among the Ngork Dinka the legality of marriage is emphasized and assured by the payment of bridewealth cattle (*ghok thiek*) by the kinsmen of the bridegroom on the one side to the kinsmen of the bride on the other, and is distributed among the latter according to an accepted pattern of rights. The distribution covers relatives, not only on the paternal side, but also on the maternal side, though the majority of the cattle go to the former.

The accepted pattern of distribution among the Ngork is as follows :—

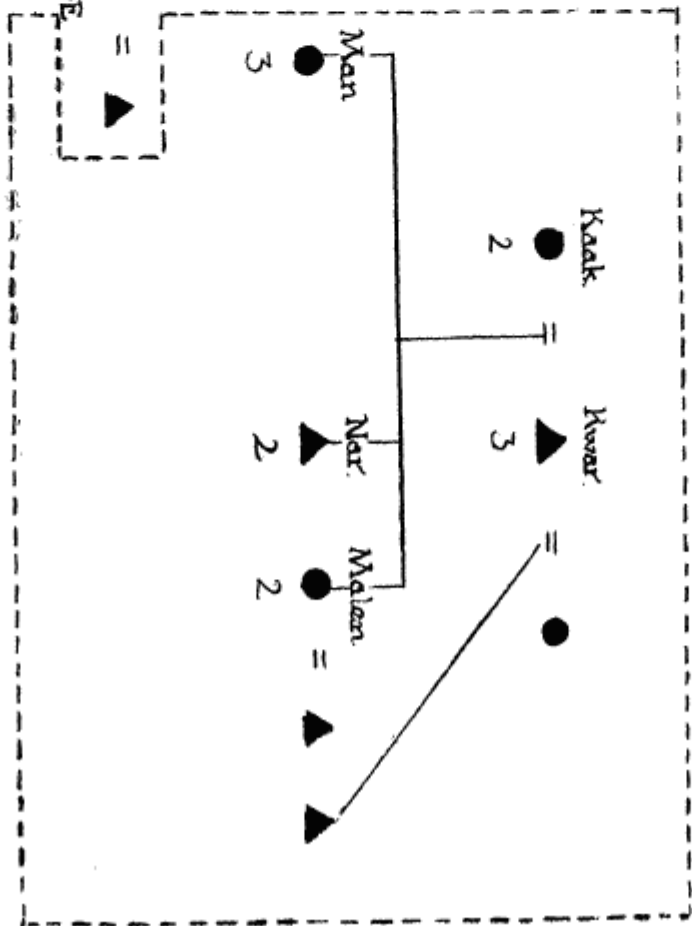
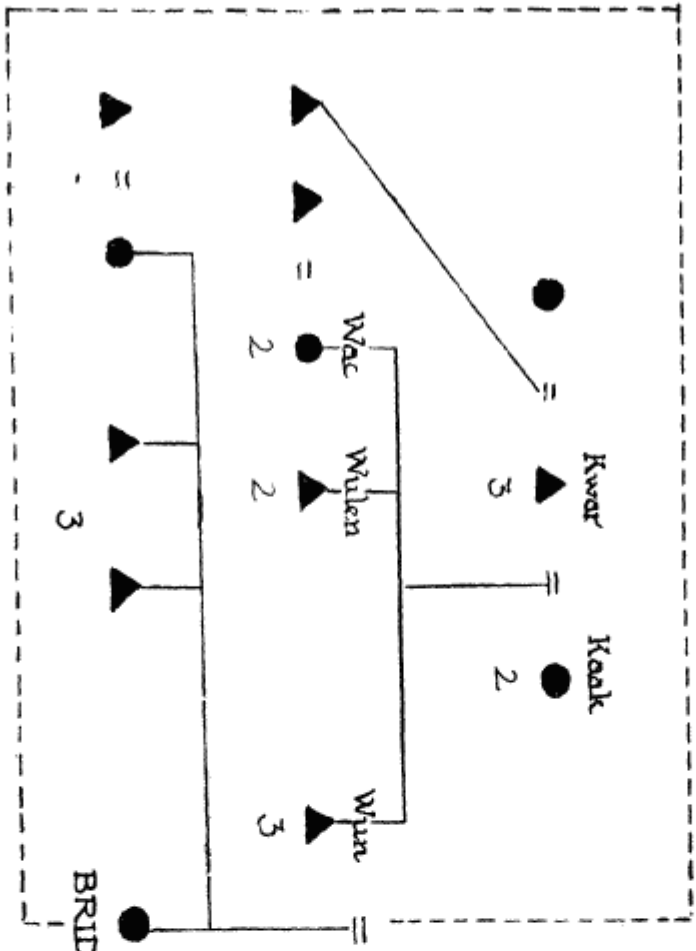
Father's side (*wun de nya*)

wun : (Father) *weng de wun*. A cow and cow-calf and an ox ; (held by the father himself and usually acquired by one of his sons) 3
*ghok a yith*¹, 'cattle of the spirits,' three cows, sometimes more, distributed among the uterine brothers and half-brothers of the bride. 3

kaak : (Father's mother)

weng de kaak : A cow and cow-calf (usually inherited by one of her own sons, e.g. the bride's father himself or one of his uterine brothers). 2

¹ *Yith* or *yiith*, pl of *yath* : an ancestral spirit, totem.



These are, in fact, the cattle divided among the bride's father and his sons—within what we may call the immediate family of the bride. On the paternal side also are the *ghok a dhien* 'the cattle of the lineage.' These may vary in number, but it is expected that the following portions will be paid :

<i>wulen</i> :	(Father's brother)	<i>weng de wulen</i> . A cow and a cow-calf.	2
<i>wac</i> :	(Father's sister)	<i>weng de wac</i> . A cow and a cow-calf (given to her own sons and hence passes out of the lineage of the bride's father).	2
<i>kwar</i> :	(father's father)	<i>weng de kwar</i> . A cow and cow-calf and an ox <i>mior de kwar</i> . (It is sometimes said that these cattle should go to his sons by another mother to that of the bride's father).	2
			Total :

15

Mother's side (Maternal uncle's side) *man de nya*.

<i>man</i> :	(Mother)	<i>weng de man</i> . A cow and cow-calf and an ox. These descend by right to her own sons, e.g. uterine brothers of the bride.	3
<i>nar</i> :	(Mother's brother).	<i>weng de nar</i> . A cow and cow-calf.	2
<i>kaak</i> .	(Mother's mother).	<i>weng de kaak</i> . A cow and cow-calf. (These may be claimed by her own sons—e.g. uterine brothers of the bride's mother).	2
<i>kwar</i> :	(Mother's father)	<i>weng de kwar</i> . A cow and cow-calf, and <i>mior de kwar</i> , a bull. (These should go to one of his sons by another wife. e.g. the bride's mother's half-brothers).	3
<i>malen</i> :	(Mother's sister).	<i>weng de malen</i> . A cow and cow-calf. (These go to her own sons and hence outside the lineage of the bride's mother).	2

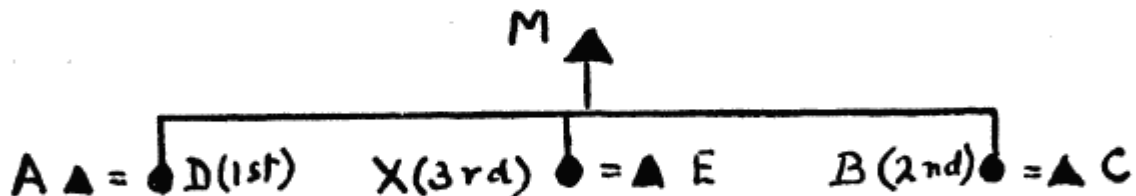
Total : 12

I could not guarantee that the actual number of cattle would always be quoted as recorded here, but, with minor variations, this is the ideal stated to me on many occasions and after analyses of actual marriages, it appears that they do in fact follow as far as possible this pattern. The following points may be noted ;—

- (a) The mother's portion is included on the maternal uncle's side, although in fact these cattle go to the mother's own sons and hence to the paternal side. The proportions between father's side and maternal uncle's side are therefore 18 : 9 in reality.
- (b) There is a distinction between claims based on uterine connections and connections through the father and there are conventional indications as to whom the portions go by right, if the person to whom the right initially belongs is dead.

Further Payments.

(a) *ariek*. These consist of five head of cattle (four bulls and a cow) which the bridegroom pays in the name of the bride's elder sister and which are claimed by the latter's husband. Superficially, this is similar to the *weng de wulen*, the paternal aunt's portion (which go to her own sons), but further analysis shows that it is a separate transaction which is also reciprocal. It is, moreover, the woman's husband who is the actual claimant, thus establishing a link between the bridegroom and his wife's elder sister's husband and finally his wife's younger sister's husband, because he can, in turn, claim a similar number of cattle from the latter. Thus :



D, B and X are the daughters of M. A marries D : C marries B, and E marries X, in that order.

- (i) A claims *ARIEK* on the marriage of C to B.
 (ii) C later claims *ARIEK* on the marriage of E to X.

This form of reciprocal transaction appears to be widespread among the western Dinka block. In the absence of further information¹ I do not propose to digress further on the subject, for, although the custom is of obvious significance in a general analysis of Dinka kinship systems, it is

¹ There are no references in published literature to this custom, though there are occasional references in administrative reports and correspondence from elsewhere in Dinka country.

not directly relevant to a study of Dinka law¹. It may be noted, however, that *ariek* is sometimes a subject for litigation in the Courts.

(b) *arweth* : Reverse payments. Among the Ngork Dinka, this consists of approximately one third of the total bridewealth paid and is given, on confirmation of the union, to the bridegroom by the bride's family. The cattle paid are not taken from those already paid by him as bridewealth and they are distributed among his relatives as they would be in marriage : e.g. the greater proportion go to the bridegroom's paternal relatives, the smaller proportion to his maternal relatives and in particular to his maternal uncle².

Divorce and Dissolution of Marriage.

(i) At the dissolution of marriage the transference of cattle goes into reverse and theoretically all the original cattle should be returned to the bridegroom. Divorce may occur owing to the incompatibility of the couple or because the wife is not able to fulfil her procreative obligations, for among the Ngork Dinka, as among all Nilotics, it is an inherent duty of marriage that the wife shall produce children. Marriage may also be dissolved if the woman dies without issue. This, however, is not a strict rule and depends largely on the relations of the two groups concerned and of the husband with his wife's family. Usually, if she has left two children living, there will be no demand for the return of bridewealth. In such circumstances the wife's family will normally compensate the widower by payment of six head of cattle known as *adut* and may also assist him to

¹ I am indebted to Mr. G. Leinhardt for the following comments : The first sister's *arik* or *ariek* appears to be given on the marriage of any older sister—i.e. marriage brings *arik* to the husband of the second sister, to the husband of the third sister and so on. He adds that : the husband of the youngest sister then gets *arik* from the marriage of the daughter of her eldest brother—that is, a girl brings *arik*, on her marriage, to her father's youngest sister's husband ; (*mony yiwac*). It may be noted that the custom is known as *dhiop* among the Dinka of Bor Dinka.

² *arweth* : This customary payment is clearly not restricted to the Ngork Dinka. Among the Dinka of Tonj District it is said to be something between one third and one half of the original bridewealth. In Bor District, and this is perhaps true of all Dinka west of the Nile, it is called *alok thok* and consists of two head of cattle only, while among the Rueng (Alor, Kwil and Awet of Western Nuer District) it is called *athek* and ranges from two to three head of cattle. Among the Atwot Dinka it is called *thiuk*, and consists of a cow and a cow-calf. The Atwot have particular affinities with the Nuer their dialect being closer to Nuer than Dinka, and it is interesting to note that the custom, also called *thiuk* and consisting of two head of cattle, is followed by the Jagei, Dok and Aak Nuer of Western Nuer District, while it is unknown elsewhere in Nuerland. There are no references in published literature to this payment, and this information is drawn from administrative files,

get married. In some cases, however, all cattle may be demanded back with the exception of a number sufficient for the husband to retain legal rights over the existing children, *ghok aci le pal midu*, 'cattle left in place of the children,' though there appears to be no distinction in numbers according to sex, as is usual among most Nuer tribes and some other Dinka tribes. If a man leaves no cattle and later wishes to claim the children as his own, he must pay six head of cattle for a boy and ten head of cattle for a girl. This is quoted by the Ngork as a recognized law, but it must clearly be a question of agreement between the parties concerned.

(ii) In cases of divorce, the husband must pay back the *arweth* cattle to his wife's family and also any cattle (*ghok ariek*) which he has received on the marriage of his wife's younger sister.

(iii) Theoretically the *original* cattle paid must be returned together with any of their offspring and many of these may have been passed on in other marriages as bridewealth. Nowadays, the Ngork are usually willing to compromise in accepting substitutes, though there is often much argument as to the relative merits of the cattle concerned. It will be seen that a divorce among the Ngork Dinka, especially a divorce instituted after several years of marriage, is a complicated affair and a very large number of persons are concerned. It is therefore in the interests of all those persons to see that the marriage is a successful and stable one and the system is one which makes for stability in marriage, though it is not the only factor relevant in this respect. Moreover, it is obvious that divorce in the past was extremely rare, especially after a marriage was confirmed by the birth of a child. Up to this point the process of returning bridewealth payments would be a relatively simple matter as compared to a divorce after several years of marriage. The stability of marriage among the Ngork Dinka, as indeed among most Nilotics, cannot, however, be attributed solely to deterrent effect of the complications involved in a divorce. This may be a contributory factor, but the main factor making for stability is to be found in the slow process of flirtation, courtship and marriage, which gives Dinka youths and girls the maximum opportunity to find the right mate. Occasionally, of course, girls are forced by their families to marry old and rich men whom they do not favour and, with the bridewealth standing at about thirty head of cattle, it is sometimes said by the Ngork that it is difficult for a young man to get married at all. This does not, however, appear to be the rule, for although many old and important men have a large number of wives, most men of thirty have at least one wife.

The main principles which underlie the marital and kinship systems of the Ngork Dinka have been described above in sufficient detail to allow us

to examine the laws concerned with such matters in their proper setting. Disputes may well appear before the Court and the rights and obligations raised in legal marriage are consistently upheld in the Court nowadays. Such customary payments and conventions may therefore be spoken of as law in the strictest definition, for they are applied with, in the final event, the force of penal sanctions behind them. In most cases a man will be forced to fulfil his obligations and will eventually be punished if he does not.

The Violation of Rights in Women

It has been said that the Nuer do not attach great importance to physical paternity. This observation is also true of the Ngork Dinka where, again as among the Nuer, the primary object of marriage is legal paternity. I do not wish to exaggerate this attitude, because it is obvious that, both among the Dinka and the Nuer, a man wishes to be not only legal but also physiological father of his children. The relations of the sexes are in no sense indiscriminate or uncontrolled and the violation of a man's rights in his wife's body which he acquires in legal union will be hotly resented.

Among the Ngork Dinka we must again distinguish between the infringement of marital rights which we may call adultery in the normal sense of that expression; intercourse with a woman who is not legally married though living with a man in some form of at least temporarily stable union; and finally intercourse with women in the status of girls, which, for want of a better term, I have called seduction of unmarried girls. This distinction is not only necessary in an analysis of legal wrongs as part of a general study of Nilotic law, but also because the term adultery is in fact very loosely applied in administrative correspondence and reports and even in published literature. This indiscriminate use of the term adultery¹ follows from the common application of the Nuer word *ruok* and Dinka word *aruok*, meaning compensation for an infringement of rights in women, whatever their status. The words refer to the indemnity not to the offence.

Adultery and the Seduction of unmarried girls.

Adultery among the Ngork is composed by the payment of an indemnity which is three head of cattle for the mere act and six head of cattle if the woman becomes pregnant.

¹ One reads of 'adultery with an unmarried girl,' 'adultery with a girl resulting pregnancy' etc.

Similarly, compensation (again called *aruok*) is demanded for the seduction of unmarried girls and is recognised as being three head of cattle and is payable whether a child is born of the offence or not.

Without going into further details of the way in which these legal wrongs are dealt with by the Ngork Dinka, I quote here a few actual legal cases as examples :

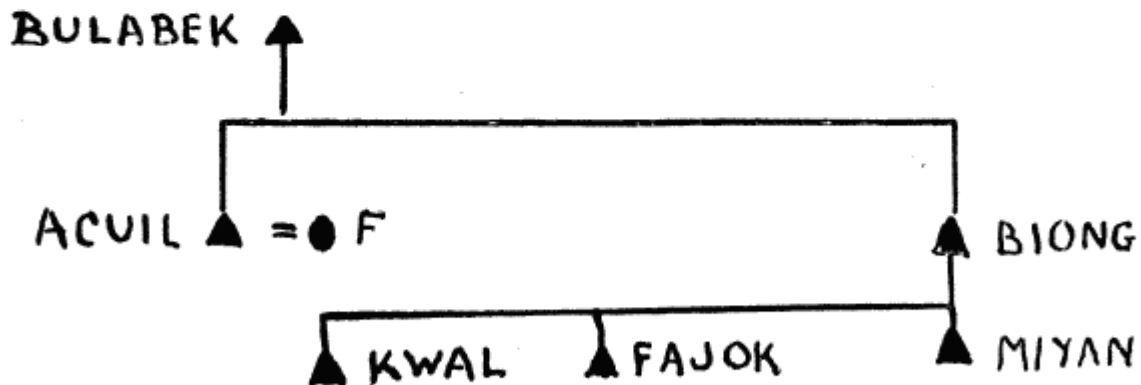
CAN DE MALITH V. MATIANG AJING (NGORK COURT 1947)

MATIANG committed adultery with CAN'S wife, in the absence of CAN. Sentenced to pay three head of cattle *aruok* and to six months imprisonment.

COL AJING V. PATAL ABOULLAI, (NGORK COURT 1946)

COL AJING was betrothed to a girl, had completed most of the bridewealth payments, but had not performed with her the final ceremonies of marriage. She then committed adultery with PATAL and a child was born to her. The Court first sentenced PATAL to six months imprisonment and to pay three head of cattle *aruok*. The marriage was then dissolved and the three head of cattle went to the woman's family as legitimization fees for the child.

ACUIL DE BULEBEK V. KWAL, FAJOK and MIYAN DE BIONG and DENG YOL.



KWAL, FAJOK, and MIYAN all committed adultery with F in the course of one month i.e. their paternal uncle's wife. A man, called Deng Yol unrelated to any of them, also did so at a later date. The Court imposed no sentence of imprisonment, but KWAL, FAJOK and MIYAN were compelled each to pay six head of cattle — here referred

to as *awec*¹ for their act was considered incestuous, while DENG YOL was made to pay *aruok* of three head of cattle only. I suspect that the judgement in this case was biased by the fact that ACUIL is a prominent Court member and has a peculiar influence over the Court President.

This case would indicate that the relationship of the parties concerned is not relevant except in so far as this case involves a breach of the rules of exogamy rather than straightforward adultery. A similar case of adultery with the defendant's father's wife was punished by sentence of twelve months imprisonment, but no *aruok*, and it is clear that most cases are judged on their merits taking into consideration all the surrounding circumstances.

DENG MAJOK V. GWING DE COL. (NGORK DINKA 1946)

A widow of KWAL ARUOP (father of DENG MAJOK) was living with ACUIL DE BULABEK by agreement with DENG MAJOK. She then committed adultery with GWING. Court ordered GWING to pay three head of cattle and sentenced him to five months imprisonment.

It may be noted here that DENG MAJOK is President of the Court and ACUIL DE BULABEK a prominent member. It is doubtful that in ordinary circumstances *aruok* would be enforced against a woman living in 'widow-concubinage.'

The sentence of imprisonment in addition to the enforced payment of compensation for adultery is, of course, an innovation due to administrative intervention. Dinka Customary Law contains no concept of punishment.

As far as adultery is concerned, the elaboration of laws to meet almost any contingency, as is found among Dinka tribes further south, has not taken place. e.g., as among the Reik and Twig where the indemnity (*aruok*) ranges from ten head of cattle to four according to the original number of cattle paid as bridewealth for his wife by the injured husband and further variations according to recognised circumstances.

Conclusion.

Occasionally cases of personal grievance and harboured animosity between kinsmen are brought to the Court for arbitration. Quarrels arise over the non-fulfilment of kinship duties and may continue even if the

¹ *Awec*. A form of conciliatory payment made to kinsmen or important persons whose good will is desired. This is discussed later,

obligation has been discharged. One of the parties to the dispute may well lose the advantages which membership of a kinship group provides, since opinion within that group is solidly against him. In such circumstances he may conciliate his angered kinsman by payment of an indemnity in cattle known as *awec*. The payment is purely voluntary and appears to apply, at anyrate in its more exact meaning, between close kinsmen or neighbours. One has no need to conciliate those further removed in the social structure, for their displeasure is no great inconvenience. With the establishment of the Court, cases of this sort are sometimes forcefully settled and persons compelled to pay this kind of indemnity or punished if they refuse.

It appears also that it was customary for a man to pay *awec* to a *bany de ring* for some offence or insult, but again in the past there was no question of compulsion. During the course of examining a number of appeals from the judgements of this Court, it was apparent that in many cases *awec* had been forcefully exacted and paid to the *bany de ring*. Since the *bany de ring* concerned were in fact either the President, Vice-President or at anyrate some prominent member of the Court, there was here an obvious abuse of powers, accorded by the Government, under the cloak of established custom. In many cases the original offence was alleged to have been in the form of an insult to Court members during the course of normal proceedings, and it might have been legitimate to punish the offender for 'contempt,' but the fines imposed could scarcely be allowed to go the court members themselves and a ruling was given that *awec* in such circumstances was not legally enforceable.

I mention this distortion of custom through the agency of an alien institution because, though in this case an abuse, it is symptomatic of the evolution of customary law under the influence of Government. In a sense all customary law was voluntary since there was no means of enforcing it. All wrongs were private wrongs and were only set right if the prevailing sanctions were sufficiently effective. The principle of self-help and retaliation is no longer as effective as it was and hence an increasing number of disputes are brought to Court for settlement and often demands which in the past would have had no chance of success. Moreover, the tendency now is for an ever-increasing body of purely customary observances or conventional duties to be accepted as enforceable laws for which a man may be fined or imprisoned if he refuses to honour them. There is a danger in this and some effort must be made to check the process. Otherwise the most intimate personal relationships will all be governed by law and bound

by the deadening effect of official intervention. The Government, in its impartial isolation, is a convenient medium through which social friction of the most trivial kind can be removed. Hence, again, a steady increase in litigation. Among the Ngork this tendency is, perhaps, less marked than among many Nilotic tribes where litigation sometimes reaches fantastic proportions. Yet, as elsewhere, cultural changes must be met by a readjustment in custom governing human relationships without resort to legal institutions. The demand for legal redress in almost every sphere of human activity may lead to stagnation in just this essential readjustment and result in further social disharmony which endless recourse to the Court cannot remedy.

ملخص

هذه دراسة قدمها الكاتب للنظام الاجتماعي والسياسي والعادات السائدة في قسم من قبيلة الدنكا يعرف باسم « الجورك » ويسكن في جنوب مديرية كردفان وقد بين مركز الرؤساء والاجراءات التي تتبع في قضايا القتل وفي الزواج والطلاق

THE PROPOSED SAMPLING CENSUS IN THE SUDAN¹.

By C. H. Harvie.

Financial approval has been given to hold a pilot census in the Sudan in 1952/53. A pilot census is merely a try-out of the scheme for the main sampling census, but on a very, very miniature scale. If the pilot census throws up no insurmountable snags, it is hoped to hold the main sampling census in 1954/5. Since the intended procedure for the pilot census and the main sampling census are, apart from the scale of operations, basically the same, very little will be mentioned about the pilot census, except to say that its purpose is : (i) to test the questionnaire by seeing if sensible answers are received to the different questions ; (ii) to test the form of organization ; (iii) to test the type of enumerators available ; and (iv) to provide data from which the necessary sample sizes in the main sampling census can be calculated. In short, to show up snags of all kinds and to provide data. It will take considerable time to analyse thoroughly the results of the pilot census ; that is why the main sampling census is not contemplated for some time afterwards. Before an outline is given of the plans for the main sampling census, it should be stressed that they are still only tentative. They may be modified by the Census Committee (consisting of representatives of various Departments), which has yet to be convened. And almost certainly, from the experience gained in the pilot census, at least minor improvements will be able to be made in the plan.

That a population census of the Sudan is badly needed will be denied by few. Good population statistics will ease many general administrative problems. They will be of assistance in Town Planning. They will help in determining the correct location of any future industry that may be started in the Sudan. They will be an aid in planning agricultural development. And they will assist in the tackling of many sociological problems. Indeed, it is hard to think of any problems connected with economic or sociological planning that will not be greatly facilitated by having reliable demographic statistics. However, we need not labour the point : the need for population statistics is generally acknowledged.

It would certainly be foolish to underestimate the difficulties of taking a sampling census in the Sudan. The large nomadic population, and the

¹ Part of the material in this article appeared in *Population Studies*, and is reproduced with the kind permission of the editor.

fact that many people live in scattered dwellings, which show little tendency to agglomerate into villages, make it, without question, one of the most difficult countries in the world in which to hold a census. Nevertheless, it is believed that, except in about two districts, good results will be obtained. The pilot census will show whether this belief is justified.

The principal problems to contend with in taking a census are illiteracy, superstition, poor communications ; suspicion by the *Omdas* (headmen of areas) and Chiefs that the purpose of the census is to increase taxes ; and, with the nomads and scattered populations in the southern provinces, difficult sampling frames. The shortage of persons of sufficient education to act as good enumerators rules out at the start any possibility of taking a full count census. In any case, in the conditions prevailing, a sampling census seems likely to be more accurate. For only the best enumerators, with a sampling census, will need to be chosen ; and they will be able to spend more time with each family, eliciting the correct answers to the Questionnaire. A further advantage of a sampling census is that the *Omdas* and chiefs, sheikhs and headmen — just because it is a sampling census— will, it is hoped, be much more ready to co-operate. For they should realize that the sole object of the census is not to check up on their tax lists. There is one problem that is particularly acute in some areas — the tendency for the head of the family to declare the total number of his children as one less than the true number. The deduction of one is looked upon, apparently, as a sort of insurance premium against the visitation of bad luck. Where the enumerators are allowed to enter the houses, they can talk to the wife and see the children for themselves. But where they are not allowed, the best way of avoiding such errors appears to be to have local enumerators. Local enumerators would be “ au fait ” with the number of children people had had, and would therefore not be easily hoodwinked. As a further precaution, women enumerators when they are available might accompany the male enumerators ; they would be of assistance because they would be able to enter the houses.

Estimates of the population of each *omodia*, or in the 3 southern provinces of each Chieftainship, are required for administrative purposes¹

In addition, separate estimates are required, as an aid to Town Planning, of the population of the more important towns with inhabitants of over 2000. The fact that an *omodia* (or Chieftainship) is a relatively small unit, and that the variance in the population size of villages (or of sheikhships or

¹ In some areas, the unit will be a Mekship, and in others a Sultanship.

headmanships) is high, immediately makes certain sampling methods unpractical. For example, it would be unpractical to attempt to estimate the population of *omodias* (or chieftainships) by taking a sample to determine the average number of persons per village (or per sheikh or per headman); this average then being multiplied by the number of villages (sheikhs or headmen) in the *omodia* (or chieftainship). With such a method, to get any reasonable degree of accuracy, it would be necessary to include practically all the villages (sheikhs or headmen) in the sample. It is thus essential, in order to reduce the necessary size of samples, to bring supplementary data into play—data highly correlated with population size.

In the Sudan, there are three types of persons that a sampling census must cater for: "sedentary persons" living in settled and well defined villages; "sedentary persons" living in scattered huts, as in the southern provinces; and fully nomadic peoples. The appropriate sampling methods are different for each of these categories.

In most *omodias* in the northern and western provinces, the sedentary people live in well defined villages. The appropriate sampling method is single-stage sampling by village, the number of householders being used as supplementary data. This terse statement needs explanation. To start with, to provide the supplementary data, it will be necessary to ask all sheikhs to count the number of householders in their sheikhships, at the same time stating when they send in their returns the name of the village they are in charge of. (Usually, one sheikh is in charge of a village, but sometimes there are two). The term householder is well understood in the Sudan; it means the head of a family who all share the same cooking pot.¹ In each *omodia*, a certain number of villages will be randomly selected, and the population in the selected villages fully enumerated. Care will have to be taken that there were no "houses" missed; it occasionally happens that some of the houses lie outside the village boundaries. But there is no real problem: all that is necessary is for the Sheikhs, after the village proper has been enumerated, to lead the enumerators round these outlying "houses." The sample taken of the randomly selected villages will provide a ratio—the ratio of persons to the *declared* number of householders. An estimate of the population of the *omodia* can then be obtained by applying this ratio to the total number of declared householders in the

¹ The term house, used in the ordinary sense, is very often ambiguous. For in any one compound, there may be several buildings or huts dotted about. Indeed, very often there is not even a compound.

omodias.¹ It will be noted that the declared number of householders is used both for the total number of householders in the *omodias* and in calculating the ratio from the sample. This is important. For by this procedure an automatic compensation is made for the fact that Sheikhs, fearing some form of increased taxation, will almost certainly understate the number of their householders.² (True, the degree of understatement will vary from sheikh to sheikh; and this will add a component of variance in addition to the "between village variance" in the ratio of the number of persons to the actual number of householders. But this additional component of variance can be allowed for by taking a somewhat larger sample.)

All in all, a sampling census of the sedentary peoples in the northern and western provinces should not be too difficult. But a census of the nomads in these provinces will be a very much tougher proposition. Consider, for example, the Beja district, the home territory of the "Fuzzy-Wuzzies." This one district, larger than the whole of England, is very thinly populated, containing, perhaps, less than 275,000 people, nearly all of whom are nomads. The "Fuzzy-Wuzzy," as everybody knows, obtains his living from breeding cattle and camels. He has no permanent home, having to keep moving with the seasons in search of grazing. The sole protection for himself and his family from the elements is a sort of tent, which can be packed up and put on the back of a camel in a matter of minutes. A full-count census of such people would be utterly impossible: you would never be able to find them all. One's first thought is to attempt some form of area sampling. But this would not work: the enumerators and field supervisors are not sufficiently skilled. Fortunately, the prospects are not quite so bleak as they first appear. District Headquarters knows the names of all *omdas* and sheikhs within the district, and usually—but not

¹ Another method would be for the Sheikhs to send in returns not only of the number of householders, but a complete list of all the names of householders. The enumerators when they went round the randomly selected villages would then record on the Questionnaire form whether the person was on the Sheikh's list of householders, checking against his list in verification. You would, as before, by this procedure, obtain from the sample the ratio of persons to declared number of householders. A possible advantage, however, of this method is that it would allow multi-stage sampling to be used. That is, in the selected villages in the *omodias*, only a proportion of the inhabitants would be enumerated—say, the "family" of every fourth householder. Moreover, it is possible that the Sheikhs, since they had to record the names of householders, might take more trouble to make their lists more accurate. The disadvantage of enumerating only a certain proportion of the people in the selected villages is that a larger number of villages would have to be included in the sample to obtain the same degree of accuracy. And more villages in the sample means that more transport will be needed.

² This procedure is equivalent to taking two samples: one to discover the ratio of persons to actual number of householders; and another to discover the raising factor, i.e., the ratio of should-be householders to declared householders.

in this particular district—the names of all animal owners. The names of animal owners on the sheikhs' tax lists do not include the names of all adult males. If the head of the family has two or three sons working for him, only his name will appear on the tax list. Indeed, in extreme cases, one person, so far as the tax lists are concerned, may represent 10 or 15 adult males. The first step towards a sampling census in the Beja District is the preparation of tax lists giving the names of all animal owners, or better still the names of all adult males. The Governor of Kassala has stated that the latter is quite possible, but that it will take a year to do. It must not be expected that such lists for each sheikhship will be accurate. They most certainly will not be; for the sheikhs will fear increased taxation. If they contain 80-85 per cent. of the names they ought to, that will be about as accurate as can reasonably be expected.

The plan for obtaining population estimates of any nomadic *omodia* is to select at random a certain number of sheikhships in each *omodia* and by sampling methods to obtain a ratio of the number of persons per animal owner (or per adult male) on the tax lists. This ratio will then be applied to the total number of animal owners (or adults males) on the tax lists in the *omodia* to obtain an estimate of the total population of the *omodia*. But how are we to undertake sampling with a population constantly on the move? The key to the problem is the correct choosing of the census date. If a suitable date is chosen, a fair proportion of the families in each sheikhship will be found in "clusters" round watering places.¹ Sheikhs would of course know where these "clusters" of their followers were. One "cluster" could be randomly chosen in each of the sheikhships selected for sampling. The enumerator, mounted on a camel and accompanied by the sheikh (or his representative), would be instructed on arrival at the "cluster" to run down the sheikh's tax list of animal owners (or adult males), which would be arranged in alphabetical order, and select the first person on the list who happened to be there. The enumerator will go to this person's tent and complete the questionnaire for him and his family, next enumerating the families in the nearest so many tents.² The total number of families to be enumerated in any one sheikhship will be in proportion to the number of animal owners (or adult males) on the sheikh's

¹ There is no reason to believe that the families in the "clusters" round watering places will be any different to the ones not there. No substantial bias should therefore result.

² It is possible that the followers of several sheikhs might be found congregated round the watering place. The enumerator must disregard all persons who do not belong to the sheikhship that he has been detailed to enumerate.

tax list. The purpose of selecting families in this way is partly to reduce the distance to be travelled by the enumerator—for even at a watering place families may be fairly widely dispersed ; but also to prevent the sheikh's leading the enumerator round to those tents he thinks he ought to go to—namely, to the tents of animal owners who are on the tax lists. If this occurred, the sample would clearly be biased. It could happen, but it is not thought likely, that, even if the enumerator recorded all persons in the "cluster," the number would still fall short of the required number. As a precautionary measure, every enumerator must be given a second and third "cluster," also selected at random, to which he could go. At the second "cluster," he will follow the same procedure as at the first, enumerating a sufficient number of families so that the aggregate, including those enumerated at the first cluster, is equal to the required number. It is very unlikely indeed that a third cluster in any sheikhship will have to be visited. When the enumerator completes the questionnaire he will, for all males over puberty, record whether they are on the sheikh's tax list of animal owners (or adult males), checking against the list in verification. It is vital that the enumerator realises that he must not record males as on the tax list who he thinks should be on it, but only those who actually are on it. It is only by this method that the ratio obtained from the sample of persons per animal owner (or adult male on the tax list) will automatically compensate for the fact that tax lists of animal owners (or adult males) are incomplete. In other words, this method is equivalent to taking two samples : one to find out the ratio of persons per animal owner (or adult male), and a second one to determine a raising factor, i.e., the ratio of should-be persons on the tax lists to those that actually are on. To recapitulate : the method proposed for obtaining population estimates for nomadic *omodias* is to employ multi-stage sampling, by sheikhship and "cluster"; a uniform fraction of the number of people in each selected sheikhship being enumerated. The sample will provide an estimate of the number of persons per animal owner (or adult male) on the tax list ; and this ratio can then be applied to the total number of animal owners (or adult males) on the tax lists to obtain a population estimate of the *omodia*.

These, then, in the northern and western Provinces, are the intended methods of sampling the sedentary and nomadic populations. There is, however, one further small complication. We have assumed that these populations are separate and distinct. But this is not always so. Sometimes a small proportion of the followers of a nomadic *omda* live in settled villages. It is unusual ; but it can happen. Consequently, there is a danger of double counting. It is a danger, however, that can easily be overcome. All that has to be done is to adjust the list of animal owners on

the tax lists so as to exclude all those people living in settled villages. The District Commissioner will have to run through with each sheikh his list of taxpayers, asking where each taxpayer lives. Sheikhs have phenomenal memories and could state without difficulty which of his followers lived in settled villages and towns.

In the three southern provinces, where the population live in scattered huts, methods somewhat similar to those just outlined for nomads could be used. District Headquarters knows the names of all chiefs, sub-chiefs, and headmen, and also, since poll taxes are levied, the number and names of taxpayers on each headman's list. Population estimates are required for each chieftainship. The appropriate method is to select at random in each chieftainship a certain number of headmanships ; and then in each of the headmanships selected to enumerate a fixed proportion of the families of all adults males on the tax list. In other words, the method used will be multi-stage sampling with a uniform sampling fraction at the second stage. The purpose of the sample, as before, will be to obtain a ratio of persons per adult male on the taxpayers' list ; this ratio then being applied to the total number of adult males on the tax lists in the chieftainship. The sampling procedure at the second stage will be similar to that used for the nomads. For each selected headmanship one enumerator will be appointed. The enumerator will be instructed on meeting the headman, to start with a person randomly selected from this taxlist.¹ Having completed the questionnaire for him and his family, he will then enumerate the families living in the nearest huts, recording at the same time which males are on the taxlist. The number of families to be enumerated in any headmanship will be in proportion to the number of its taxpayers. It is possible, admittedly, by selecting families in this manner that the sample might be biased : if, for instance, taxpayers' huts were congregated in one area, and if taxpayers' families were different from those of non-taxpayers. No tendency of this being so has yet been discovered ; nor is there any reason why it should be. The reasons for selecting the families in the nearest huts to that of the family originally selected at random are the same as those for the similar selection of families with nomadic tribes—to cut down walking distance for the enumerator, and to prevent the headman leading the enumerator to only taxpayers' houses. With scattered huts, in partially wooded country, their systematic selection—i.e. the choice of, say, every fifth hut—would be extra-ordinarily difficult if not impossible. It will

¹ Only a negligible amount of bias should be introduced by starting off with a taxpayer's hut. Alternatively, other instructions could be given to the enumerator for selecting the first hut. But they might not be quite so simple.

again be noted that the proposed method of obtaining from the sample the ratio of persons per adult male on the taxlist is equivalent to taking two samples : one to discover the ratio of persons per adult male, and another to discover the ratio of should-be taxpayers to actual taxpayers. Our method automatically compensates for any deficiency in the tax lists. For the greater the deficiency in the lists, the larger the ratio, other things being equal, of persons per adult male on the tax list.

In the above discussion of sampling methods, we have assumed, for simplicity, that all people in the northern and western provinces live in settled villages, and that all people in the south live in scattered huts. This assumption is not universally true: in some chieftainships in the south all the huts are in well defined villages, and in some *omodias* in the west they are scattered. In practice, each *omodia* or Chieftainship must be considered as a separate problem. If all its "houses" are in settled villages, then the sampling method for settled villages must be used. If scattered, then that for scattered dwellings is appropriate. The reason why different sampling methods are required is that in settled villages, the enumerators can be sure they have visited all the "houses"; whereas in areas with scattered dwellings they can't. They would have no method of knowing that they had covered all the "houses", except the headmens' and sheikhs' word for it; and they might easily be tempted deliberately to forget about the houses of persons who they knew should be on their tax lists but were not. A further reason for the difference in method is the necessity, where you have scattered dwellings, of reducing the distances to be walked by the enumerator. For him to have to cover all the scattered dwellings in a headmanship, even on the doubtful assumption he could find them all, would take too long, and would therefore be very expensive.

Care will have to be taken in the enumeration of special elements in the population — the Sudan Defence Force, those in timber camps, in prisons and other institutions. These elements can be fully enumerated separately. But care must be taken to see that such people are excluded from the *omda's* (or chieftain's) list of householders (or adult males). Otherwise there would be duplication.

Only one element in the population has yet to be covered — that of people living in towns and villages with over 2,000 inhabitants. There are not many towns of this size — perhaps an average of about 5 or 6 a province — and estimates of their population will be done separately from that of the *omodia* in which they are situated. The householders living in such towns to be enumerated separately must of course be excluded — or shown separately — from the *omda's* list of householders. There is nothing difficult about the enumeration of such towns; a full count census could

easily be done if thought desirable. It will probably be best to do a sampling census of persons in the "Native Lodging Area," and a full count census of people living in the "first and second class" areas¹.

Once estimates have been made, by the above methods, of the population of each *omodia*, chieftainship, and of all the large towns, it will, of course, be easy to build up the population estimates of each district, each province, and of the country as a whole. It is proposed to take samples of sufficient size as will keep the sampling error of estimates of the population of each *omodia* or chieftainship to within fiducial limits of 10 per cent. (at the .1 probability level). Estimates of the total population of each district, and still more of each province, will have smaller sampling errors. Those of districts, for instance, may have sampling errors of only 2 or 3 per cent. On the other hand, sub-estimates in each *omodia*—of the number of females, for instance, or the number of persons in a certain age category—will have larger sampling errors. It is the intention to control directly only the sampling errors of the total population of each *omodia* or chieftainship, those of sub-estimates being allowed to look after themselves. Sampling errors, it will be realized, are the errors that occur owing to the vagaries of chance. If an enumerator calls on every fifth house, it is possible that, purely by chance, these houses may contain slightly larger or smaller families than the average. Sampling errors can be controlled within any prescribed limits by varying the size of the sample. The larger the sample, the smaller the sampling error. But there is also another sort of error—a biased error. If everybody in declaring the number of their children always deducted one from the true number before telling the enumerator, that would be an example of a biased error. Such errors cannot be eliminated merely by increasing the size of the sample. Errors of bias are additional to the sampling error.

Although the ideal is to take a census simultaneously all over the country in one day, the shortage of enumerators makes this quite impracticable. Of necessity the census count in this country will have to be spread over a considerable period—perhaps as much as 9 months. It is not only that the work of enumeration will take time. The best time for taking a census in any district—and particularly of the nomads—is when the people are congregated; and these dates differ widely from district to district. With a time spread of this length, there is, of course, the danger of double counting; and this, with the sampling methods suggested above, would take the form of a distortion in the ratio of persons per adult male on the

¹ Towns in the Sudan are divided into areas according to the standard of building to be erected.—Ed.

tax list (or in the ratio of persons per householder). To avoid double counting, the census will have to be a *de jure* count, and not a *de facto* one. People will have to be enumerated according to their "normal" place of residence. For example, the enumerator will have to ask the head of the family of each "house" visited whether there are any other members normally resident with the family but who are temporarily away. If there are, questionnaire forms must be made out for them showing them as residents of the same place as the householders. Non-residents who happen to be staying with the family must be excluded. There is one exception to these rules. People who are being enumerated as special elements of the population—those in prisons or timber camps, for example—must not be counted as normally resident with their family even if they spend the greater portion of the year with them.

The danger of double counting or of missing people altogether, is not, in fact, as great as might first appear. Many tribes, such as the Dinkas, are migratory, in the sense that at certain times of the year they leave their permanent homes and move to their cattle camps. Not quite everybody moves to these cattle camps; a few of the old people are left behind in the permanent homes. If the most suitable place to enumerate the tribe is in their cattle camps—as it very often is—it should not be difficult for the enumerators to ask the head of each family what old people have been left behind in the permanent homes. The Gezira is another place where the enumerators will have to be on their guard; for labour moves in at certain times of the year to help harvest the cotton. But the movements of labour are mostly well known. If labour moves into the Gezira from areas "A," "B" and "C" and then after the harvest moves back again, the way to avoid double counting (or alternatively missing people) is to have the sampling census in all these places at the same time. The avoidance of double counting is largely a matter of careful synchronization of census dates as between areas between which there is an ebb and flow of labour. So far as possible the dates chosen should be when people are in their normal places of residence. The transient population who move in an unpredictable way must be very small indeed.

The proposed questionnaire is very similar to that to be used for the Southern Rhodesian census. The suggested questions are:

PART "A" (for the individual).

1. NAME
2. TRIBE
3. NATIONALITY
4. RESIDENCE :

- Town or village (where applicable)
 Omodia (or Chieftainship).
 District.
 Province.
5. PLACE OF BIRTH :
 Town or village (where applicable)
 District
 Province.
 Country (where applicable).
6. SEX
7. CONJUGAL CONDITION :
 (a) Married
 (b) Single
 (c) No. of wives.
8. OCCUPATION :
 Primary.
 Secondary.
9. HIGHEST SCHOOL ATTENDED :
10. AGE IN THE UNDERMENTIONED GROUPS :
 (a) Under 1 year.
 (b) 1 to 5.
 (c) 5 to puberty.
 (d) over puberty.
 (e) past child bearing age (women only).
11. FERTILITY (to be answered by all women over puberty) :
 (a) Number of live children born.
 (b) Number of these children still alive.
 (c) Number of live births during past year.
 (d) Number of children who died during past year when under 1.
12. LANGUAGE SPOKEN IN THE HOME.

PART " B " (for the household or family).

1. MORTALITY :

No. of persons in the family who died during past year.

These questions should be within the intelligence of nearly everybody. Although many people do not know their exact ages, they should have little difficulty in placing themselves, or their children, in one of the above broad categories. The age of puberty, rather than any specific age, is an important milestone, for it is then that persons cease to be children and become workers or pass into the reproductive ages. In many parts of the country, custom

dictates that the reaching of the age of puberty shall be made the occasion of scoring tribal markings onto the face. Little difficulty should therefore be experienced in stating whether the person is over or under the age of puberty. In some cases, parents, when particularly unsophisticated, may have slight difficulty in placing their children according to the earlier age groups. But such cases should only be few ; and, when they do occur, enumerators, just by looking at the children, should be able to prompt the parents without too much error. It should be remembered, however, that the ages of children under 5 may be given in " Arab " years, and " Arab " years are slightly shorter than a calendar year. But allowance can be made for this by asking these questions slightly differently. Another difficulty may occur over the age-group for women " of past child bearing age " : some women may not wish to admit this. There are many other questions that one would like to include in the questionnaire, but to overload the enumerators would be asking for trouble.

Needless to say, if the census is to be a success two very important aspects are the training of the enumerators and census supervisors, and propaganda work. Enumerators and census supervisors will have to be drawn from such people as elementary and subgrade schoolmasters, court clerks, dispensers, mosque men, pensioners, police, soldiers, midwives, and anybody else who is literate and sufficiently intelligent to do the job. In nearly all places it appears that there will be sufficient enumerators.¹ It is essential that local enumerators be used. Firstly, because they will be more acceptable to the inhabitants, and therefore no prejudice will be raised against the census. And, secondly, as already mentioned, because they will be less easily hoodwinked about the number of children that people have. There would be no objection, though, to the census supervisors not being local people. Enumerators need to be thoroughly trained both in filling in the forms and in the correct way of asking the questions so that the right answers will be elicited.

Propaganda must be undertaken at all levels. The District Commissioner with the aid of Rural District Councils, can do much. *Omdas* and Sheikhs must be thoroughly " sold " on the census ; and if they are, the battle will be half won, for they will use their influence on their followers. The best line of approach seems to be the general one of Progress : that it is impossible for the Sudan Government to plan where to put new dispensaries and schools unless accurate population figures are available, and

¹ Where there are not sufficient enumerators, population estimates will be made not of each *omodia*, but of Local Government areas. The larger the unit, the relatively smaller the number of enumerators required.

that it is equally difficult to plan new agricultural development and water supplies. At the same time, the propaganda should also aim at national pride — that the census will be valuable to the nation as a whole ; and that the Sudan, since it is a progressive country, must have a census just as other countries do. Propaganda must emanate from the highest levels, too. If the census has the support of members of the Legislative Assembly and of high personages, it will be a great help. If these high personages could tell their followers to co-operate, and that no evil consequences would follow from the disclosure of the number of their children, it would make things a great deal easier for the enumerators, and more accurate results would be obtained.

Inevitably, the sampling census will throw an extra burden on District Headquarters. The main tasks that will fall on them are :

1. Supervision of the preparation of lists giving :
 - (a) In the Northern & Western provinces¹, the total number of householders in each village and in each *omodia*.
 - (b) In the Southern provinces¹, the total number of adult males in each headmanship and in each chieftainship. Also in all headmanships to be sampled —and in only those to be sampled — the *names* of all adult males.
 - (c) For nomadic tribes, the total number of animal owners (or adult males) in each sheikhship and in each *omodia*. Also in all sheikhships to be sampled, the *names* of all animal owners (or adult males).
2. The selection, training, and pay of enumerators and census supervisors.
3. The allocation of the census supervisors and enumerators to their different tasks.
4. The distribution of questionnaire forms and their collection when completed.
5. The organization of the census in all large towns that are to be enumerated separately.
6. Propaganda work of all kinds.
7. The organization of transport.
8. General supervisory role throughout.

¹ These are used as convenient terms. The real test as stated earlier, is whether the persons in the *omodia* (or Chieftainship) live in well defined villages or whether their "houses" are scattered,

At present, no one can state for certain that we shall be able to achieve a successful sampling census in all tribes and in all districts. The pilot census should give us a good guide as to what is possible — that is one of its objects. It is hoped, and believed, that we can undertake a successful sampling census everywhere except amongst the Kababbish and Hawawir in the Northern District of Kordofan. Time will show whether this belief is too sanguine. Even if we take a pessimistic view, we should be able to undertake a sampling census in all districts except about four. And even that would be a very real achievement.

One thing is certain: the Sudan has now reached a stage in its economic and social development when it can ill afford to be without reliable demographic statistics. We have lived in a statistical blackout long enough.

ملخص

يصف الكاتب الطريقة المزعم اتباعها في احصاء شامل للسودان باكملة خلال سنتي ١٩٥٢/١٩٥٣ بعد القيام بتجارب محدودة خلال سنتي ١٩٥١/١٩٥٢ وبما انه من العسير جدا عمل احصاء مبني على عهد كل شخص في البلاد فقد رؤى الاخذ بطريقة (الششنة) وهي اختيار بعض نماذج يمكن بطرق فنية في علم الاحصاء التوصل منها الى تقدير مضبوط للقطر باكملة ولكن ربما اجري في المدن احصاء لجميع افراد السكان

A NOTE ON ZEOLITE ARTEFACTS

By G. Andrew

First presented to the Philosophical Society of the Sudan as a Short Communication
on April 25th 1950.

ZEOLITES have been recorded in noteworthy quantities from Neolithic occupation sites in the form of worked artefacts and, more rarely, from gravels at or near the base of the alluvial deposits of the Blue Nile valley.

The worked zeolite material is recorded from Jebel Moya (Addison, F. 1949) as lip plugs and beads, from Shaheinab and Goz village (A.J. Arkell) as lip plugs and from Goz Bakhit (H.G. Balfour-Paul) in the form of a bead.

Unworked pebble material is recorded from Shaheinab, Goz village, Gordon's Tree, J. Aulia dam site, Meheiriba well, Galegu, the Atbara valley at Sarsareib, and in a borehole in the Sudan Club grounds Khar-toum.

At J. Aulia (west end of corewall excavation) flaked quartz is also found with the pebbles and the Gordon's Tree site is an occupation site. The places where the zeolite pebbles occur without any record (so far) of human remains are Meheiriba, Sarsareib and the Sudan Club bore. The Galegu site is doubtful — no pottery etc. was observed but the finder was not on the lookout for human remains.

In the "natural" occurrences in the basal alluvial gravel beds of the Blue Nile valley, the zeolite pebbles are associated with bones and teeth, recalling the collection found under the caisson of the moving span of the Blue Nile bridge, in which a tooth of a middle Pleistocene elephant was found (Andrews, 1912).

Most of the zeolite material which is fashioned into lip plugs etc. is Scolecite (not Natrolite as stated by Addison). Some of the pebbles are composite. Among the pebbles Scolecite is predominant, but Natrolite does occur. In the basal gravels of the alluvium agate pebbles are also common. The optical properties of the zeolite material referred to Scolecite are variable and frequently non-characteristic, probably owing to slight variation in hydroxyl and to some base-exchange having occurred. Two specimens were analysed by the Government Analyst :—

					Lip plug J. Moya	Shaheinab 11862
Si O ₂	..	..	..	..	46.76	46.80
Al 2O ₃	..	..	..	..	27.86	27.20
Ca O	..	..	..	..	11.88	12.08
Mg O	..	..	..	..	trace	0.23
S O ₃	..	..	..	..	trace	0.26
Ign. loss	..	..	..	..	13.16	13.40
Sum	..	..	..	..	99.66	99.97

The special interest of these records is partly archaeological and partly geological. The original source of the pebble material is clearly the lavas of the Ethiopian plateau, certainly as far as the Blue Nile and Atbara deposits are concerned. It seems probable that the material collected and worked by Neolithic peoples came from exposed gravels. The actual source of the material which supplied sites in the Khartoum area and J. Moya is not yet known.

The zeolite artefacts are larger than the pebbles so far found in the Blue Nile basal alluvial gravels and the level at which these now lie suggests that these gravels may not have been exposed during Neolithic times, at any rate close to Khartoum or near J. Moya. The occurrence of unworked material with the artefacts (*e.g.* Shaheinab, Goz village and Gordon's Tree) suggest that quantities of the raw material were carried to those village sites for working.

Pebbles of large size so far recorded (50 mm. x 35 mm. diameter), apart from those in Neolithic sites in the Khartoum neighbourhood, are those from Galegu on the Dinder collected by Ahmed Eff. Said, and from Sarsareib (30 mm.) and Goz Regeb (60 mm.) on the Atbara. The basal alluvial gravels in the Blue Nile valley have so far yielded pebbles of 10 mm. and less in length.

The geological importance of these zeolite pebbles lies mainly in their occurrence in a gravel bed at the base of the Blue Nile alluvium near Khartoum and in the northern Gezira. The associated teeth and bones, comparable with those of the material found under the Blue Nile bridge, provides a dated horizon for the base of the alluvium in this area—middle Pleistocene. The present level at which these gravels are found indicates the amount of depression of the valley of the Blue Nile since middle Pleistocene times, as well as providing satisfactory evidence of the depression. The level of the gravel is significantly lower than that of the present rock floor at the south end of the Sabaloka gorge, *c.* 70 km. downstream of

Khartoum, which is given as 359.50 m. R. L. (all levels referred to Khartoum gauge zero—360.000 m.)

Focality and number.	Coordinates		Occurrence	Position
	N.	E.		
J. Moya..	13°30'	33°20'	lip plugs	in alluvium, in a hill above plain level.
Shaheinab	16°64'	32°32'	lip plugs, pebbles	in alluvium, Neolithic (distributed).
Goz village 11861	15°35'	32°31 1/2'	lip plugs, pebbles	in alluvium, Neolithic site.
Gordon's Tree 11712	15°33'	32°29'	pebbles.	on surface, with pottery etc, at ca 378 m. R.L.
Goz Bakhit	14°42'	33°14'	bead	on surface with artefacts etc.
J. Aulia west 6616,4127,5754..	15°14'	32°28'	pebbles	dredged from corewall trench, with agate, bones, fish scales etc.
Meheiriba well.. 6888	14°50'	33°02'	pebbles	from bottom pf well, 24 m. depth, with agate and bones etc. at 370 m. R. L.
Sudan Club bore	15°37'	32°32 1/2'	pebbles	from gravel with bones etc. 354-353 m. R.L.
Blue Nile bridge	15°37'	32°33'	(bones & c. in gravels)	Bones, elephant tooth, middle Pleisto- cene from gravel at 352 m. R.L. in bed of dry stream.
Galegu .. 11863	13°36 1/2'	35°02'	pebbles	There is a record of an "ancient village site" nearby.
Sarsareib.. 12077	15°22 1/2'	35°47'	pebbles	in river gravels.
Goz Regeb 12003.	16°04'	35°47'	pebbles	in river gravels up to 60 mm. diameter.

References.

Addison, F. 1949, Wellcome excavation in the Sudan, *Jebel Moya*.
2 vols.

Andrew, C. W. 1912, "Note on the molar tooth of an elephant from
the bed of the Nile, near Khartoum" *Geol. Mag.*
No. 573 pp. 110-13.

Arkell, A. J. 1949 *Early Khartoum*.

Further records of zeolites, both worked and in pebble form, are wanted.

The material is white in colour, usually opaque, with occasional iron-staining. Pebbles are either elongated rounded cylinders, or frequently conical, and look like teeth in shape and colour. A prismatic striation can be seen in most pebbles, slightly radiate parallel with the longer sides of conical pebbles. Both worked and unworked material occur frequently with pottery, rubbing stones etc. on the surface of mounds (Neolithic sites). Records, with specimens collected, should be sent either to the Commissioner for Archaeology or to the Geological Survey, together with coordinates, a description of mode of occurrence, and samples of other fragments (pottery, worked stone etc.) found on the site. Relationship to stream beds etc. and other features in the neighbourhood should be noted.

THE SPELLING OF PLACE NAMES IN THE SUDAN

By J. W. Wright and G. Janson-Smith

First presented to the Philosophical Society of the Sudan at the Fortythird Ordinary Meeting on March 24th. 1951.

In opening the discussion of this subject I want to try and keep clear of detail, and I shall not describe or advocate any particular form of spelling or transliteration. What I want to do is to give in as few words as possible some account of the difficulties of the subject, which is far more complex than most people suppose, and to try and arrive at the basic principles of our attitude to it in the Survey Department. Mr. Janson Smith will then give an account of the particular difficulties now being experienced in spelling names uniformly in the southern Sudan.

After having been directly concerned with the spelling of geographical names in this country for three years I have come to the conclusion that there is really only one principle which is unassailable. This is that it is desirable that each name should be spelt in the same way by everybody. I do not think that this will be seriously questioned by any responsible person. The questions which do cause discussions and divergence of views are firstly how much trouble is worth while in working towards this end, and secondly how best to achieve it.

The first need not detain us long. For many purposes and in most cases alternative spellings of place names do little harm ; but they give a printed work a slovenly appearance akin to that produced by grammatical or typographical errors. They are of course much less obvious to the layman than these unless, like Lawrence in *The Seven Pillars*, the writer deliberately introduces different spellings of the same name into the same paragraph where they strike the eye and confuse the reader. Even without this extreme step the use of different spellings in different publications by the same government may lead to confusion, particularly when the initial letter is changed so that the name will appear in the wrong place in an index of the work. Also, where places are not large or well known and where several closely allied forms of the name occur, a slight misspelling may easily cause wrong identification. Most of us are concerned at some time or other to write clearly and concisely and without ambiguity what we want to say ; and it is surely an essential part of this process that we should be able to refer unequivocally to any places which we mention.

This can only be done if each name has a unique spelling, and I suggest that it is worth quite a reasonable amount of trouble to achieve it.

The second aspect of the question — how to achieve this unique spelling — is the subject with which this paper is mainly concerned. By uniqueness of spelling I mean not only in official reports and scientific papers but also in ordinary correspondence and even in the daily newspapers. Here again there emerge two rough principles with which few will quarrel. The first is that the 'official' spelling of a name should be that which is acceptable to as many people as possible, and the second that it should conform with whatever system of spelling or transliteration is used for ordinary words in the language from which the name originally comes. Unfortunately it is not always possible to reconcile these two principles, and it is here that most of the alternative spellings now in use have arisen.

These rough principles are therefore far from being as unassailable as the first one — of the desirability of uniqueness in spelling — and the ways in which diversities of spelling arise can best be illustrated by following through the process by which a local or native name is written in the alphabet of a more civilised language. People often talk about correct spelling but I want to illustrate how difficult it is sometimes to know what is correct. There are two stages in this process: first the recording of the native name, and secondly its conversion to the alphabet of the second language. Where the natives of a region have no indigenous written form of their language the initial recording of a name by the literate foreigner must be by sound, allied possibly to some form of meaning which the name may be supposed to have. Here at once are endless possibilities of ambiguity and even error. A great deal depends on the intelligence, experience, and ear of the foreigner; and also to a less extent on the honesty and intelligence of the natives whom he questions. We all know examples of the commoner mistakes such as *Jebel Ma'arif* (I don't know) or *Jebel Sakit* (That's just a *jebel*), but there may be other more complicated influences at work. The so-called native who supplies the name may not be one at all. For example he may be an Arab in Fur or Nuba country who will give to the European visitor a version of the local name which will be in an Arabic form. This is because it is a natural tendency to convert an incomprehensible sound into some sort of word in one's own language. The British Army is particularly good at this, as witness the *Wipers* (for Ypres,) and *Eatables* (for Etaples) of the First World War, or the *Boiled Duck* (for Bois le Duc) of as long ago as the time of Marlborough. In a border area between two languages which is to be taken as the local one?

Another common cause of mistakes in recording local place names is the failure of the foreigner to understand the local attitude to the larger

geographical features such as streams and mountains. It requires a certain degree of sophistication to think of these and name them as a whole ; and in the less civilised parts of the world it may be found — for example — that the local people have no name for a *wadi* or mountain, but only separate names for the areas of cultivation along it or the slopes facing their particular village¹ & ¹⁰. Thus the foreigner will be given a different name for what is to him the same feature by the different people who live along or round it, although they all speak the same language. If the recorder of place names is too persistent he will get a name, but it will not have any true local significance and will therefore not be correct. Apart from these genuine sources of misunderstanding and error there may be ulterior motives at work such as a desire to prove local ownership of an area, or general hostility and distrust of a stranger, leading to the deliberate giving of wrong information.

Where the local language has been written for centuries — as with Arabic — a great deal of this difficulty disappears, since the effect of writing is to crystallize thought and the people will themselves have had the stirrings of the ideas which I am trying to express, in that they will have some realization of the convenience of referring to a place in the same way all the time. In this case of course there may still be for the purist chances of discovering that the locally written name is wrongly translated from the original native form. This may never have been written by the people who are now subjects of the more sophisticated and literate rulers of the country. But the practical man will leave such questions severely alone, and will be content with the written form which he finds, provided to course that it is well established by reasonably long and wide usage.

This shows the pitfalls which occur in the first stage. If the native alphabet is the only official one in the country the work is then finished ; but in most African countries, including the Sudan, this is not so and it still remains to convert the name into another form, either from the phonetic symbols in which an unwritten name is ideally recorded, or from the native alphabet in which it was originally written. In the Sudan we have to find an 'English' or Romanized form of all names, which means that all of them have to be converted or transliterated. To do this we must have some system whose function is to express the sound of the original language — to each of which there corresponds in theory a single letter — in the letters of the second language, so that those who use this may be able to identify the name and to pronounce it sufficiently correctly for practical purposes.

¹ See list of references at end of paper

Sooner or later one comes up against the problem of a sound in the first language which does not occur in the second and to which therefore no letter or group of letters in it correspond. Examples of this are 'ch' sound of the Scottish loch, which corresponds closely to the Arabic *kha* (خ) but for which there is no English equivalent. Another is the Arabic *ghain* (غ) which no European can ever quite pronounce correctly. What is one to do about these sounds when trying to write in the second language a name which includes them in the first?

There are four alternative ways of doing this, and these may be grouped in pairs to form two fundamentally different solutions to the problem. The first alternative is to introduce into the alphabet a completely strange letter which may be a new one altogether, like the inverted c etc. advised by the International African Institute² and the Rejaf Conference³ to represent certain sounds in Central African languages. Alternatively a letter like the Greek *Epsilon* may be borrowed from another alphabet. The second alternative is to use normal letters of the second alphabet but add diacritical marks (accents, cedillas, circumflexes etc) to differentiate them when they represent these special sounds. This was the method used by Kemal Ataturk in 1928 when he converted Turkish from the Arabic form of script to a Roman one⁴.

The third and fourth alternatives make use of normal letters of the second alphabet but in the first case only single letters are used and they are given a value which they never normally have. The best example of this is the use of q without u both in transliterating Arabic to represent the deeper and more guttural *qaf* (ق)⁵ and also in Greenlandic to represent a very similar sound⁶. In the fourth alternative two letters of the second language which are never normally *combined* (though they may be found together) are used to represent a single sound because when spoken quickly with their usual pronunciation they do approximate to it. Examples of this are the use of *gh* for the Arabic *ghain* (غ) and *kh* for the *kha* (خ).

All these methods have their advantages and disadvantages and all are used in different systems of transliteration or of writing the language of an illiterate people. Most systems include more than one of them. Generally speaking the great advantage of the first two alternatives (apart from the obvious ones when teaching people to write their own language) is increased precision of writing, which means that the origin and pronunciation of the native word can be derived directly from its written form by anyone who takes the trouble to learn first what the special letters or their accented forms represent. The same advantage applies to the third alternative — the use of a normal letter in an abnormal way. The disadvantages are that to those who do not take this trouble (and we must

accept the fact that they will be the majority) the written forms of these words or names are unfamiliar and confusing. A more serious disadvantage attaches to the first alternative when name spelling alone is considered.

This is that only those who have the special letters in their type founts or on their typewriters are able to print or type them. The use of these special letters is certain therefore in many cases to lead to two versions of a name, since there are bound to be printed or typed documents in which the special letters do not appear, and in which they have been replaced by substitutes taken from the standard letters of the alphabet. The same disadvantage occurs to a less degree in the case of the second method—the use of diacritical marks — though here it is merely laziness rather than lack of the necessary type which leads to their omission. In both cases it is of course possible in typing to add them afterwards by hand, or in the case of some accents on the machine. But both are tedious processes which in the majority of instances will not be carried out.

The last method, of combining two letters of the second alphabet which are not normally used together, is obviously much less precise and may mask the true derivation of the word or name ; but both it and the use of normal letters abnormally have the great practical advantage that every name can be written, typed, or printed in exactly the same way without any extra effort at all. It is therefore much more likely to be spelt in the same way by everybody however conscientious or lazy they may be. Also, since no unfamiliar symbols or uses of existing letters are introduced, it gives the layman a reasonably comprehensible word which he can attempt to pronounce with some hope of success. It is on these last two forms of lettering, which do not require extra letters or marks, that the system of transliteration at present in force in this country is based. This system was laid down by the Permanent Committee on Names for British Official Use and it is known as the R.G.S. II system. It was officially adopted by this Government in 1927⁷.

These brief remarks will have indicated the difficulties of deciding on a system of transliteration or of writing for the first time the language of an illiterate people. Choice of the system will depend on who is going to use it. The teacher, anthropologist, and missionary (who is usually a bit of both) prefer the first three methods of writing because they ease teaching and enable them to put down exactly the words they hear and to trace the structure of each word or name and its affinities with others akin to it⁸. But, as I have explained, to use these special letters requires literary conscientiousness and accuracy. These are qualities with which these professions are plentifully endowed, but which are not conspicuous in the

natives on whom they have imposed this way of writing their language. The effects of this appear when these natives first begin to use a typewriter which does not have these special letters. They cannot be bothered to insert them by hand and so there begins just what we are trying to avoid — alternative spellings of the same name. In my opinion systems of writing or transliteration based on this method are doomed never to be completely accepted because of this fundamental practical disadvantage. It should be remembered too that the advantage of precision which they have is of much less importance to the average native user of the language than to the foreigner, since he can gather from the context with little difficulty which particular sound is meant by a letter which has to be used for more than one. The varying sounds which are represented by the notorious English combination 'ough' — ow, oo, uff, off — are easily disentangled by the Englishman, however much they may trouble the foreigner.

This is only part of a general tendency in living languages with which you will all be familiar — that they lack uniformity of structure and that all spelling and grammatical rules have innumerable exceptions — in short they are thoroughly untidy. These are irritating characteristics to the purist but they have to be accepted, and in my view rather the same tendency is found in the spelling of names. Whatever system of writing or transliteration is adopted there will always be some names which were known to and written by the visiting foreigners before it came into force. If they are very well known it would appear to be foolish to try and change them, although here we may run up against the problem of a place which has a local name still in use though the foreigners use a completely different one. Wisko, facetiously named to go with Soda which is nearby, is an example of this in the Sudan. It has now been officially changed back to its proper native name of Bau. This is fortunately not common in this country, and we are faced rather with a number of names whose well established English forms do not quite conform to the accepted rules of transliteration. Khartoum is an obvious example of this since it should have no o; and other less well known examples are Jebel Aulia, which be Auliya, and Goz Regeb which should begin with a Q. Such names occur in every country and are known as exceptions established by long usage.

As I said at the beginning, from a practical point of view the only thing that really matters is that every place should be spelt in one way and one way only. While therefore we in the Survey Department do try, especially when alternative versions of a name already exist, to lead public opinion towards the correct form, we do not insist on this where the wrong form is already firmly established and the correct one, if it is used at all, only

appears in a very few cases. In fact we adopt very much the same attitude as the compiler of a dictionary⁹; we record what the public writes and we only try and convert them when there seems to be a reasonable chance of success. Otherwise we find that they continue to use the other form, and the correct one is found only on our maps and in the official reports of the more conscientious departments. It may be urged that this is always a waste of time; but it must be remembered that practically all maps and gazetteers covering this part of the world are based on our maps and the form which is uncommon in the country may therefore be accepted outside it. The spelling of Gambela without an *i* is an example of this, and our recent decision to try and kill the spelling with an *i* — which has gained wide local and official usage — was based on this principle, since it appeared that the Sudan (except for my department) was almost alone in spelling it in this way. Nevertheless it will be some time before the spelling with an *i* has disappeared, and we shall have to get the postmark stamp and the aerodrome markings altered, which shows how much trouble this sort of thing can cause.

This was an example of two alternative spellings already in use and of our deciding to kill the one which was probably less correct. In the past my department has introduced new spellings, such as Karima for Kareima, in order to be nearer either the correct transliteration or to the local pronunciation. I personally am very much against this and any attempt to establish a perfect system of writing or transliteration is in my view doomed to failure; it is comparable to the efforts of those who would kill such words as aerodrome and television. These are now firmly established in the English language however much we deplore their bastard origins. Yet in spite of this lack of precision and apparently haphazard way in which a language is built up, it is surprising how seldom there are alternative spellings for any given word. I believe that the same can happen in geographical names. There may be many exceptions to the accepted system of writing and transliteration — there will be far fewer if these are themselves based on practical rather than philological grounds — but if the less popular alternative spellings are discouraged and a conscious effort is made to adhere to a single form for each name, then in time it will be possible to approach more closely to the ideal than we can at present. I hope that in the end we can have each name spelt in one way and one way only, so that in referring to it one knows exactly what one means, and can say so with precision and without ambiguity.

J. W. WRIGHT.

SPECIAL PROBLEMS ENCOUNTERED IN THE SOUTHERN PROVINCES.

The first point which I wish to make is that we must keep very clear in our minds the difference between the conventional spelling of a name and its actual pronunciation. The only way in which a name can be written down so that it can be pronounced correctly by someone who does not know the actual language involved, is in a fully detailed phonetic script, which is obviously unsuitable for everyday use. When a practical orthography is decided upon, certain conventions are introduced which are perfectly intelligible to those who know the language but which do not help a foreigner to pronounce the name correctly when he sees it written with these conventions. I make this point because it is frequently objected that a name cannot be spelled in a particular way because 'everyone' (and that usually means English speakers) 'would pronounce it wrongly.' I would give one example of this. I have been told that the name 'Jonglei' is spelled with an i at the end in case people should pronounce it as 'Jongel'. Yet if R.G.S. II is followed, the 'i' must go out because in the R.G.S. II convention 'ei' must stand for a diphthong and for a diphthong only. Yet if we think, we are ready to accept happily a large number of conventions. We do not say that 'Boulogne' should be spelled on our maps in any other way because those who do not know French might pronounce it 'Bowlogney'. We do not suggest altering the spelling of 'Kassala' because the B.B.C. announcers sometimes call it 'Kassāla.' But all too frequently when southern Sudan names come to be written down, we allow our prejudices to enter and do not follow the clear and simple rules which are contained in the R.G.S. II system either because we do not like the look of the resultant name or because we think we can help towards a better pronunciation.

The R.G.S. II System is a system evolved by the Permanent Committee on Geographical Names which was established in 1919. It is a conventional system and is not, strictly speaking, an English alphabet, since for instance it represents vowels as Italian, although the consonants are as in English. According to the system every letter is pronounced and no redundant letters are used. This system has been adopted as the official system for writing geographical names in the Sudan, with special rules for the transliteration of Arabic names.

When one looks closely at the map sheets of the southern Sudan one is immediately struck by the fact that the R.G.S. II system has not been followed with any consistency, and that not only are the same sounds not represented in the same way but frequently one finds the same word spelled

in a number of different ways. For instance, I have found the Dinka name Maper spelled Mapair, Mappeir, Mapper and Mopeir, as well as in the correct R.G.S. way. There are also Ngopp, Gnop and Ngop all occurring on adjacent sheets for places which are pronounced in exactly the same way. Sometimes u and sometimes w is used for the same sound, as Malwal and Maluell. Similarly R.G.S. rules are disregarded in the use of i and y. Sh is used for ch as in Shish for Chich. F is used for P in such Dinka words as Pan which means a homestead and which occurs frequently. This mistake arises from mishearing the bilabial P and equating it with F. There is also confusion with the use of ai which is sometimes used in its proper Italian value but is also found representing the French e sound as in Mapair or ei as in Shwai Bet for Chwei Bet.

Many inconsistencies that one finds are caused by a failure to apply the Italian vowel rule, most usually by inserting an i after the Italian sound e, as in the instance of Gambela given by Mr. Wright. The other very common fault found is doubling a consonant because such doubling is thought to help the English speaking reader to get a nearer approximation of the sound. For instance Latome will be found spelled Latomme in case it should be pronounced Latōm. Sometimes the doubling seems to be done because of a mere liking for doubled letters, as in Laposs or Maluell, or even more inexplicably Gungerr and Misharr.

Another difficulty is met with in dealing with a final liquid n, such as in the name 'Boin'. R.G.S. II has the apostrophe to indicate the sound, yet on maps the name is written Boing. The Administration has obviously felt that this is not satisfactory and recently I saw on a signpost the name written 'Boign' which, although a noble attempt, is certainly not within the bounds of R.G.S. II. We do not seem to like the use of diacritics and so have not used the o with the diaeresis although it is an accepted symbol of the system and is needed in such languages as Bari where it occurs frequently. Instead of it one finds er, eu, o and a.

R.G.S. II also recommends the use of a for the indeterminate or neutral vowel such as one gets in the word 'marine' unless the sound definitely approximates to the letter e. There are many inconsistencies here to be found on the maps, e being used where by rule a should be. In fact although R.G.S. II is the official system, few recorders seem to have studied it and it is only applied where it produces a name that looks right by English standards.

There are other inaccuracies to be found on the southern sheets caused by definite mishearing of the names or writing names which are not true names at all. For example on Zeraf Island we have Khor Wong

Tirru. Here Khor has the same meaning as Wong, and Tirru can be derived from either Thili Rou 'There is no hippopotamus' or Thili Hau 'There is no thirst.' One also gets examples of names written in a trade language such as Bangala in the middle of an area where all the names are Bari. Such names are nearly always not true names at all but of the *Jebel Sakit* type.

So much for the actual application of R.G.S. II to the southern Sudan, but further complications arise. First of all, R.G.S. II does not cover all the sounds found in languages in the southern Sudan, and secondly we already have established certain orthographies in which literature is being produced and which have been accepted by the Sudan Government as the *official* orthographies for the different languages.

In 1926 the International African Institute was established and one of its first tasks was to formulate a common alphabet for all African languages, based on phonetic and grammatical laws. The guiding principle of this 'Africa' alphabet was one letter per phoneme and the twenty six letters of the Roman alphabet were allotted specific values corresponding largely to those of the International Phonetic Association code (which itself differs little from R.G.S. II in its treatment of single Roman letters). Certain differences have to be noticed, however, as they cause difficulties when we come to consider the writing of names on maps. The letter c by itself stands for ch (as in church); ny is liquid n even when final; the sound ng in singer and open e and o are represented by symbols and certain implosive letters are marked with an apostrophe before them. This orthography was accepted at the Rejaf Conference in 1928 and the orthographies have now been standardised, rules of orthography agreed and a body of literature produced in the main southern vernaculars. The vernaculars where an official orthography is recognised are Shilluk, Nuer, Dinka, Zande, Ndogo, Bari, Lotuko, Madi, Moru, Acoli and Toposa, thus covering the main languages of the southern Sudan.

It is sometimes suggested as an argument against the use of the accepted orthographies that educated Sudanese tend to give up the use of their special orthographies and use a spelling based on English spelling rules or the values of the English alphabet. This is unfortunately true but is a retrograde step since it is agreed that the orthographies in use in the southern Sudan are far more satisfactory for the writing and also for reading of the languages involved than any orthography using English spelling conventions. The trouble chiefly arises through a desire to copy something which has a prestige value and which is therefore considered better. It is parallel to the habit which one notices amongst educated southern Sudanese of

signing their names in an illegible scrawl. I fear that this is imitation of our own way of signing our names but is not for that reason to be encouraged.

It must be emphasised that these standard orthographies have proved themselves very satisfactory in practice and that children can be taught to read in many of them in as short a time as six to nine months. There is also a growing amount of literature, in some languages of considerable size. There can be no question at this stage of introducing any other orthography for these languages.

The problem therefore is this. In the vernacular place-names will have within each tribal area a standard spelling using the accepted local orthography. What about maps which obviously have to be used over an area wider than the tribal one ?

The problem can be presented in two parts :—

- (a) What shall be done where the alphabets employ non-Roman letters ?
- (b) What shall be done when the alphabets employ Roman letters but with different values from those found in the R.G.S. II system ?

The answer to (a) would seem to be straightforward. To recommend the use of phonetic characters on maps and therefore in print for general purposes would be premature, however ideal in principle. Many printers have not got the necessary type, the symbols are quite unfamiliar to the average reader, and there is an overwhelming prejudice against what are called "funny letters." A compromise must be made and system of transliteration worked out.

Concerning (b) the problem is quite different. R.G.S. II was designed in the first place for the recording of place names in languages which has no Roman alphabet. It was not meant for transliterating languages which already had a Roman alphabet. In fact the very first rule of R.G.S. II states „ The spelling of every place name in an independent country or self-governing dominion using the Latin alphabet (including Latin alphabets containing extra or modified letters) shall be that adopted by the country or dominion..... ” The point at issue is whether this rule should be applied in the case of languages which have comparatively recently adopted a Roman alphabet. It would seem in logic that it should. We have no difficulty at all in accepting the convention in the case of such old established European languages as Welsh and Yugoslavian. Afrikaans names are printed on maps without any attempt to put them into R.G.S. II, although a number of Afrikaans consonants have different values in pronunciation from the English values. Turkish nondiacritic names are coming to be more and more accepted as they are written by the Turks.

For example Erzincan (although pronounced Erzinjan) is written with a c on English maps and the "man in the street" has to find out for himself, if it is important, the correct pronunciation.

There seems to be however a strong prejudice against applying this rule to African place-names. For instance the spelling Paloc is objected to lest it should be pronounced by the uninitiated as Palock, whereas in the accepted official Dinka orthography oc is pronounced oich. In the accepted orthography ony is pronounced oin' but the spelling Bony is objected to lest it should be pronounced 'Boney.'

The R.G.S. II system now falls between two stools, and no amount of tinkering with it will prevent this. For it attempts on the one hand to provide a phonetic code for the recording of foreign sounds, but on the other hand confines this code to the spelling combinations familiar to the English 'man in the street.' This leads to the mistaken idea that he can without any training arrive at an approximate pronunciation of the names concerned. Also, as we have seen, there is a reluctance to use some of the conventions of R.G.S. II. The apostrophe is not used to signify the liquid n and Ngok or Ngork is written instead of Ngawk which is strict R.G.S. II.

In 1948 the Linguistic Advisory Committee of the International African Institute put forward three recommendations to be applicable in the first instance to British maps and publications and to be referred for consideration by competent authorities concerned with publications in other European languages. These recommendations were :—

- (1) That in those African languages in British territories, in which a standard spelling in a Roman or Romanised alphabet has been recognised by local governments and education authorities, the spelling of place-names on maps should follow this standard spelling.
Exception : certain places which are so well known internationally that to change their names on maps now would cause confusion at the present time, e.g. Fashoda, Wau, Mount Kenya.
- (2) Where the standard alphabet of a language contains phonetic characters or letters with a diacritic not found in the founts of English map-makers, a form of Romanisation should be worked out for the present.
- (3) That where new (i.e. unwritten) language areas are concerned, investigators should record place-names to the best of their ability in phonetic script, to be standardised later for maps at the appropriate centre,

The Permanent Committee on Geographical Names has recently shown itself convinced by the arguments put forward and in its Leaflet No. 6 of October 1950, states :—

“ The Committee has come to the conclusion that :

The R.G.S. II alphabet cannot be satisfactorily applied to the writing of geographical names in Nilotic, Negro, Bantu, Bushman or Hottentot languages,

and therefore recommends that :

In gazetteers of areas under British administration in Africa, Nilotic, Negro and Bantu geographical names should appear in the official orthography of the native languages concerned, or in the International African Alphabet, but that on maps they might be rendered in purely Roman letters by broad transcription from the official orthography, provided that, should a name in broad transcription be liable to confusion with any other name, the narrow rendering in the official orthography also appear in brackets. The suitability of broad transcriptions for international postal use should be carefully considered.

By broad transcription is meant the consistent transliteration within a given language, in the manner suggested by Dr. Tucker, of non-Roman into Roman letters, adhering to the R.G.S. II principle of representing vowels as in Italian and consonants as in English whenever possible, and avoiding the use of diacritical marks. It is to be noted that the c and x of the International African Alphabet are Roman letters and would therefore not be transliterated although their values differ from those of c and x in English.”

It would therefore seem to be the right course to apply this system to the spelling of names in the southern Sudan. It has the following advantages :— It would follow the practice recommended for other places in Africa. It would lead to uniformity of system and therefore to that standardisation which is so important. It would cause the least possible confusion to those local inhabitants who have their own established orthographies.

I should like to emphasise that we are not concerned primarily with how names shall be written on British maps, but how they should be written on Sudan maps, and therefore surely the interests of the local people should have greatest weight. Also if the name was to be first recorded in the local official orthography and then transliterated where necessary strictly according to an accepted scheme, one spelling and one spelling only would

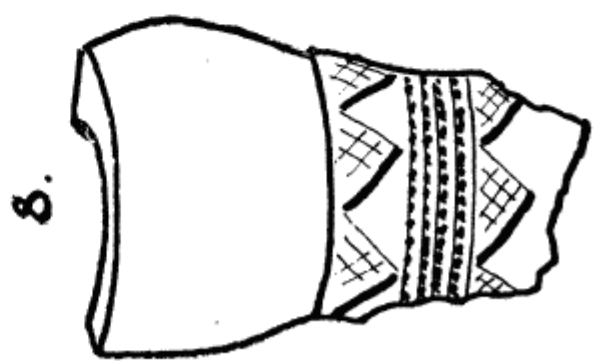
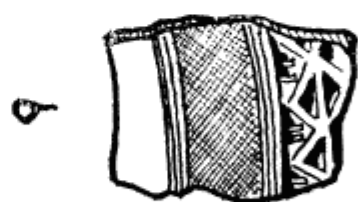
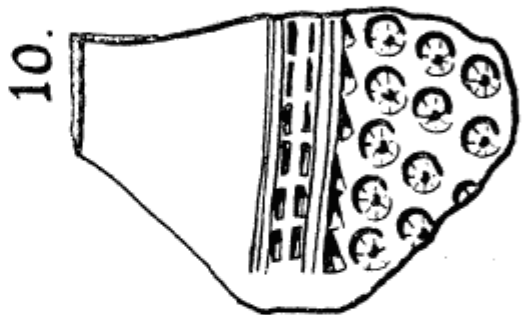
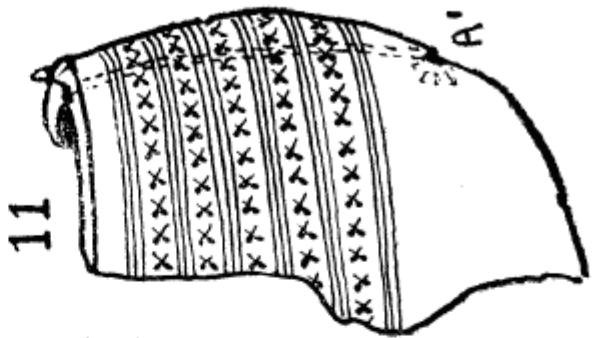
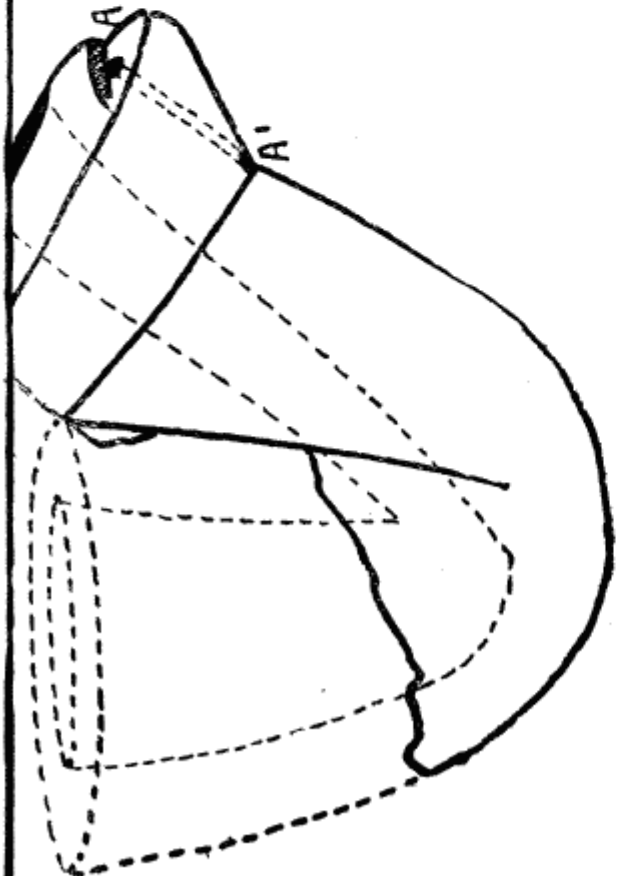
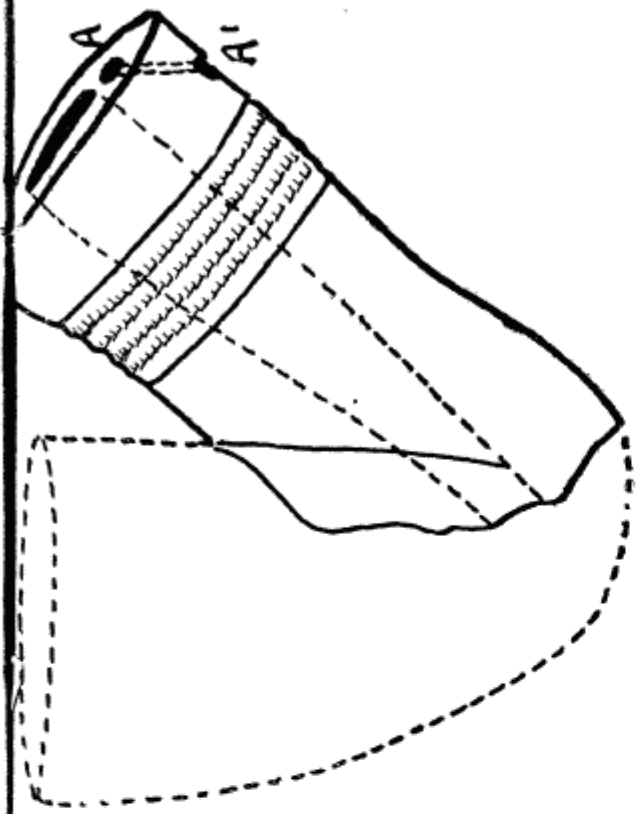
be arrived at, since in the local standard orthography there can only be one way of writing each name. If the local standard form is made the reference, difficulties of mishearing would be done away with and we should not get recorded such forms as Longba for Lugba. Each person who has to record names on maps, unless he is linguistically trained, brings his own prejudices and spelling habits to bear when he has to record a name. Hence one gets names such as Whure, which leaves one quite baffled as to how one should attempt to pronounce it.

The maps of the southern Sudan must be revised in any case since no consistent system has been followed in the writing down of the names, and it would involve little additional labour to apply the rules suggested. A short pronunciation key could be given on each map sheet, which would help the traveller to make an approximation to the sound of the name if it was necessary. The only warnings which would have to be given would be in certain areas the pronunciation of final *c* and *ny*, the *i* glide after *a* and *o* before these finals and perhaps the pronunciation of bilabia *p*. The acceptance of the unwritten *i* glide should not cause any difficulty. We take Champagne and Boulogne without complaint and also *c* for the round *ch* in such countries as Yugoslavia.

At the same time as this revision is undertaken a code of transliteration should be worked out for transliterating names into Arabic script, since with the spread of Arabic in the southern Provinces the time will not be far off when southern names will need to be written and put on maps in Arabic, and we cannot start too early getting a clearly worked out code which will be understood by all and made standard.

Mr. Wright said that he was against such alterations as Karora for Kareima, and likened such alterations to efforts to kill such words as aerodrome and television. But this alteration was surely based on the fact that to spell the name Kareima was not being consistent with an accepted system. The most important thing is to have a clear system and to follow it consistently. It is only in this way that we can hope to have each name written in one way and one way only which I agree is the most important principle for the recording of geographical names.

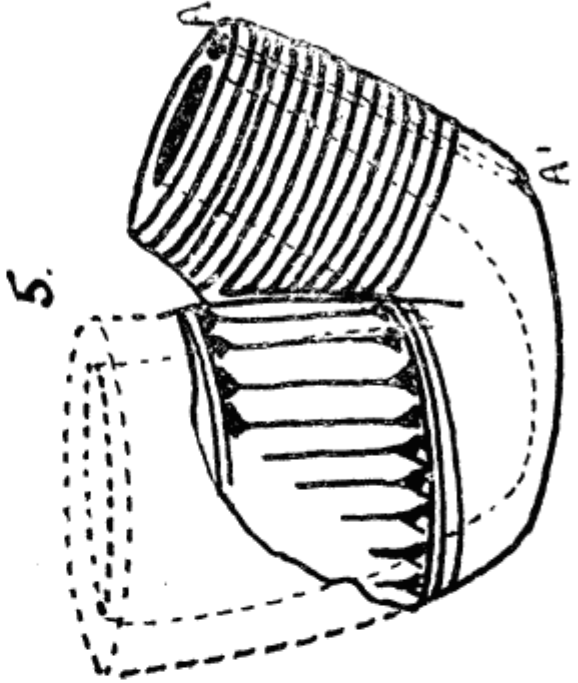
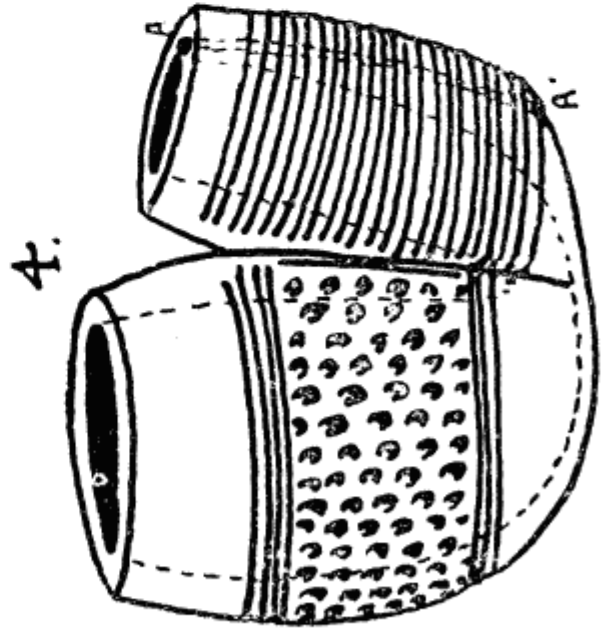
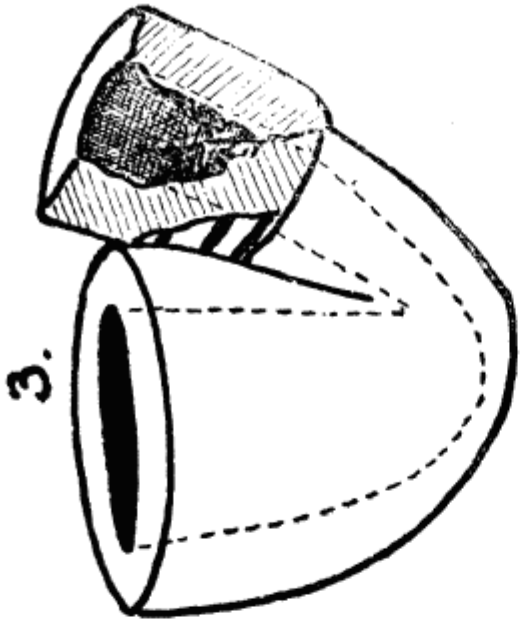
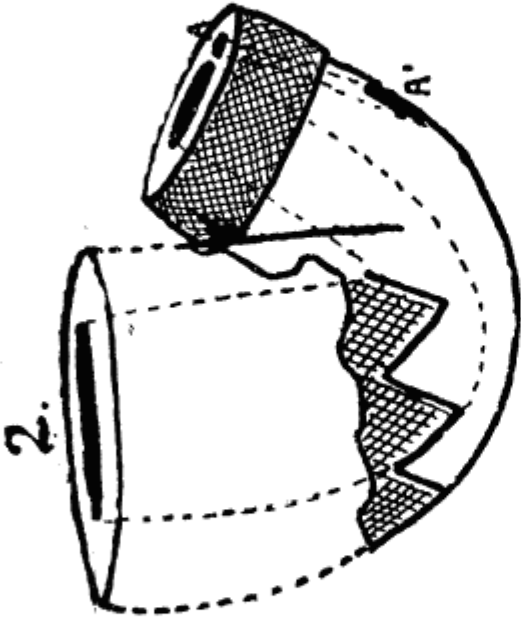
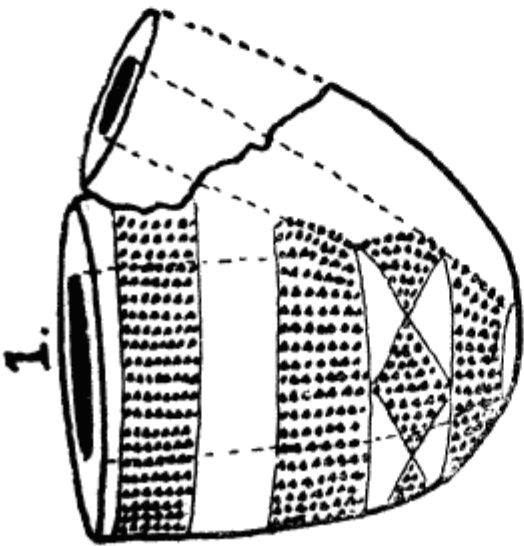
G. JANSON SMITH.



SCALE



PIPES FROM ARBAGI



NOTES

DECORATED PIPES OF THE FUNG KINGDOM

By **H. G. Balfour Paul**

Assistant District Commissioner, Northern Gezira.

At Arbagi (E. $33^{\circ} 22'$ — N. $14^{\circ} 44'$), 5 miles upstream from El Hasaheisa, amongst the surface debris of successive civilizations from the Soba Kingdom to the Condominium, are to be found considerable numbers of decorated clay or stone tobacco pipes, mostly fragmentary, of peculiar design.

Seven of these pipes are shown in the illustration (Figs. 1 to 7). Where reconstruction is not certain, approximate outlines are dotted in. Internal bores are shown dotted. Figs. 8 to 11 are fragments selected to illustrate the technique of decoration.

Most of them are of hard-fired clay, sometimes smooth sometimes gritty; but some (e.g. Fig. 8) are of hard mudstone, which must have rendered somewhat laborious the incising of a pattern. Some interest attaches to the decoration on the lower half of Fig. 10, which is punched before firing with a die in the form of a florette. The only local parallel for this, as far as is known, is on sherds from Um Sunut, near Wad Medani, thought to be post Jebel Moya but pre-Soba Kingdom.

Evidently a bamboo or similar stem was inserted in the narrower of the twin barrels. A curious, but universal, feature of the design is the small hole bored vertically through the thickness of this narrower barrel and visible in Figs. 2, 4, 5, 6, 7 and 11 in the illustration (marked A—A' in each case). Its purpose is obscure. Possibly the bowls, some of which must have been uncomfortably heavy, were attached to the stem-piece by a cord passing through this hole.

Mr. O. G. S. Crawford found similar pipes in association with stratified Fung Kingdom pottery at Abu Geili, near Sennar. Presumably, then, these Arbagi ones are to be ascribed to Fung settlers or soldiers in this flourishing early Arab town whose final destruction at the hands of the Shukria took place about A.D. 1784. Contemporary Arabs may of course have adopted the practice; — Bruce, a few years before the destruction of Arbagi, records that tobacco was much in demand in the area, and a few people now living near El Hasaheisa remember their grandfathers smoking "Damak" (the local product) in clay pipes.

It would be interesting to know whether pipes of this kind survive amongst the descendants of the Fung, or are used elsewhere in the Sudan.

NOTE ON ANCIENT VILLAGES IN KHOR NUBT AND KHOR OMEK.

By G. E. R. Sandars and T. R. H. Owen.

Sudan Political Service.

At the beginning of 1932 Mr. Foley of the Wadi Oyo mine heard from the Amara Keilab that there was an old village in K. Nubt, a tributary of K. Agwampt¹. Thinking that it might be an old gold working, he went out in January 1932 by car along the old Sinkat — Ariab road as far as K. Fot and from there by camel to the site of the village, but he found only a number of tombstones with Arabic inscriptions and a curious brick building. Red bricks, so far as we know, are not found anywhere else in the Red Sea Hills. He also found traces of a wall which he thought encircled the village. He selected two of the tombstones at random and brought them to Sinkat: one of them was dated 264 A.H. The tombstones were of a yellowish grey stone somewhat resembling marble and Mr. Foley could give no explanation of where this had come from as he met with no such stone anywhere on his way to K. Nubt.

On August 29th 1932, we reached K. Nubt by the same route as Mr. Foley. About 4 miles N. of J. Wari the ground slopes up to a gentle *agaba* past a modern burial ground. North of the top of this *agaba* the path goes into a narrow rocky defile which is the top of K. Nubt: the *chor* winds through a more or less continuous gorge for about two miles in a general direction about 10° East of North until it opens out at the site of the old village. There are numerous rock pictures on the way down, principally of cattle, two breeds of which appear, one a long-horned animal, the other short-horned: neither are drawn with a hump. About a quarter of a mile from the top of the *chor*, on the left hand side, is a very obvious picture of a man sitting and shooting with a bow and arrow and some distance further down on the right hand side is what appears to be a five-legged giraffe. Half a mile below this, on a large rock on the left hand side of the *chor*, is a name in 3-inch letters which must be meant for Joseph and other Greek characters which appear to have been written at random.

A quarter of a mile below the Greek inscription there are about 30 ruins which appear to be houses and a little further on, in a spot where the *chor* opens out, the ruins of another 20 houses of which 10 have more than one room.

¹ About 70 miles N. W. of Haiya Junction in a direct line. — Ed.

Amongst the houses is a mound on which there are some pottery fragments and also two curious holes at the bottom of the hills on the west bank of the *chor* : they are about a metre wide and appear to have been lined with flat stones arranged vertically : they are filled with rubble to within 2 feet of the top and we could not guess what their purpose was ; they were in the wrong position for wells. They might perhaps have been grain stores.

From this point the *chor* runs in a narrow defile for another half mile and then opens out into a flat basin in the hills some 600 yards long from North to South by 400 yards East to West. The South end of this opening is just about 2 miles from the *agaba* and its situation is approximately long. $36^{\circ} 12'$, lat. $19^{\circ} 00'$.

At the south end of the opening (see plan) from East to West there are first in the opening of K. Nubt itself three apparently artificial mounds and the ruins of about 40 houses : also what appears to have been an old well. The mounds, on which were found pottery, glass and beads already sent to Khartoum¹ are very like those found at Aidhab which were also covered in pottery fragments. Next is a large three-roomed house standing by itself and surrounded on the east and north sides by a wall ; from its size and commanding position (it looks out across the whole settlement) we assumed this to be the leader's house and have shown it as king's house in the plan. In the south west corner is a wall ; this and certain rock formations which look like walls from a distance on the surrounding hills led Mr. Foley to think it was a walled city but apart from the wall shown in the plan, we found no other traces of walls. Immediately North of this wall on an island in the *chor* (which may well have been joined to the mainland) are a number of ring graves and an artificial mound at the North end. In the centre of the opening are a number of ring graves and other buildings including a large and conspicuous house shown in the plan. Two of the ring graves have a diameter of about 20 yards and are the largest we have ever seen. North of them are three curious brick buildings and North East of these again are two modern Arab graveyards (A and B on the map) containing a number of Arabic inscriptions.

Certain features in the above description need further explanation.

(a) The ring-tombs. These circular heaps of stones varying in diameter from three or four metres to about ten are to be found all over the northern Beja district. Usually four or five are found within a radius of a quarter of a mile and sometimes (e.g. in K. Nubt, near Gwararawe well in K. Ariab and round the Western foot of J. Gwerad) thirty or forty

¹ Catalogued under number 2764 in the Khartoum Museum

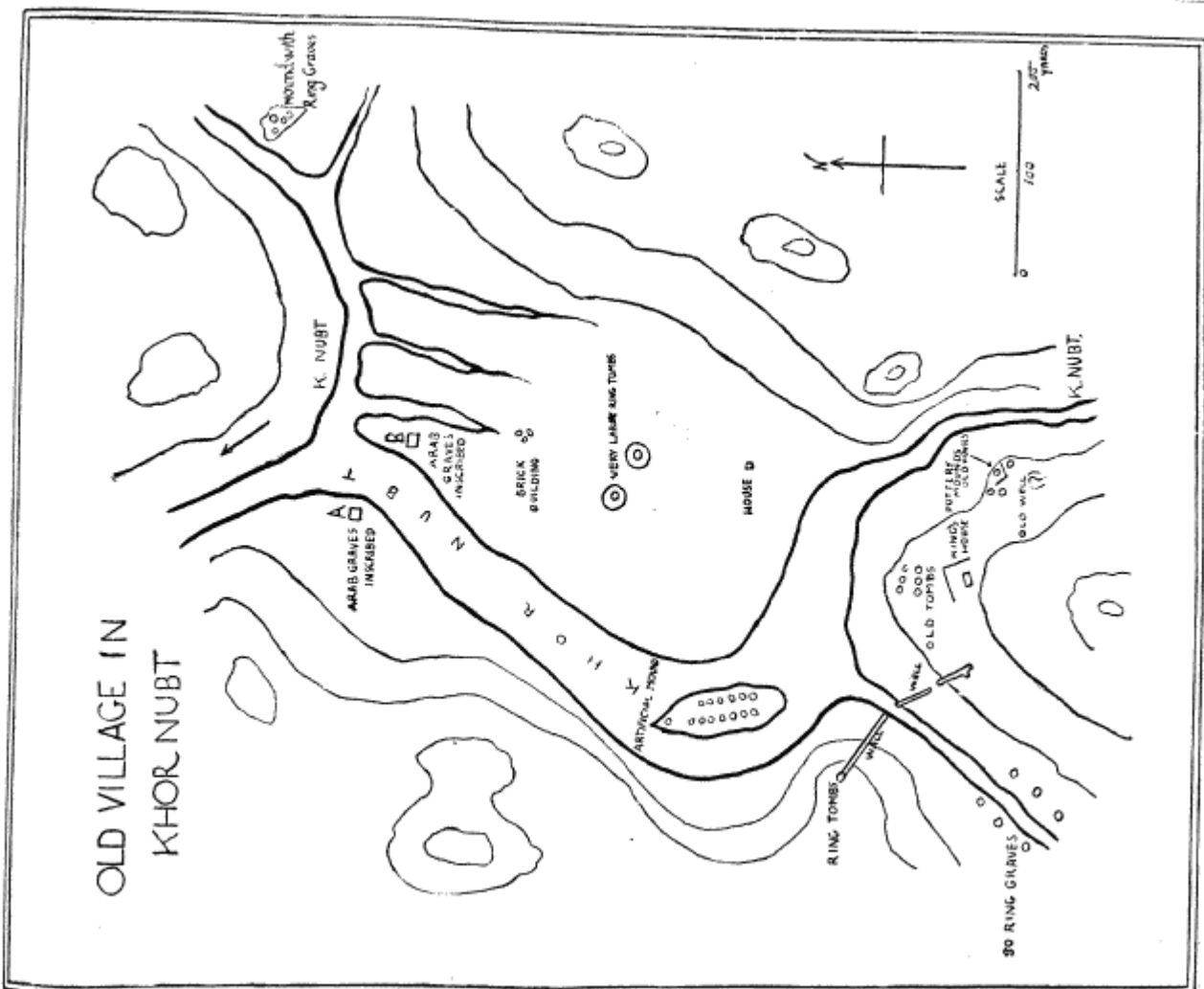
are found together. They are usually three to four feet high and built of flat stones at the outside edge of the circle laid horizontally, the basis of the stones forming a more or less regular surface ; inside this are stones of a smaller size (sometimes ordinary pebbles) so arranged that the top of the ring is flat. In the middle there is always a hole 1 or 2 yards in diameter, which seems in most cases to have been roofed over with long flat stones. Their purpose is obscure. Local Beja state that they were at one time regarded as the treasure houses of bygone races and some were broken into with unsatisfactory results. In some cases animal diseases and other disasters followed. But they state that no bones were found ; and from their situation, which is often at the top or on the side of rocky hills one would not expect to find people buried under them. It has been suggested in the case of some of them that these rings mark the way to gold mines and wells but this does not account for finding thirty or forty in one place. Their arrangement in groups of one large and several small ones, which is often found, suggests that they may have some family significance and the possibility suggests itself that they may be cenotaphs erected to celebrated men and their wives or families but not over the site of their graves. I imagine they are relics of the pre-Muslim Beja population.

(b) The wall across the south western khor. This is built of loose unshaped stones and has traces of two bastions ; there was obviously an opening about half way along the eastern portion and the other opening has probably been made by water from the *wadi*. It cannot have been a defensive wall since it could be turned from almost any direction ; the *khor* across which it is built is too small for it to have been an irrigation wall—incidentally it goes up to the top of a hill 50 feet above the *khor* level. Possibly it was built to prevent people coming to the village along that particular *khor* which would bring them almost past the door of the King's house. The only other wall encloses the King's house on the North West.

(c) The brick buildings. These are of rough red bricks probably made from mud from the north end of the village. The bricks measure $12\frac{1}{4} \times 6 \times 3$ inches and most of them bear the imprint of the hand which made them. At first sight it looks as though there is a single long brick building, but actually there are three small buildings not by any means on a straight alignment ; the southern one has internal dimensions of $2\frac{1}{2} \times 1$ yard, the other two 5×3 ; starting from the southern room, the heights of the walls standing are 4 feet, 3 feet and 5 feet.

(d) The Arabic inscriptions. Several of these have been sent to Khartoum. In a few cases they contain names and dates ranging between 227 and 277 A.H. but we could find none with tribal names ; the majority

OLD VILLAGE IN KHOR NUBT



of the inscriptions were either too faint for immediate deciphering or contained only Koranic excerpts. Altogether there must be well over a hundred fragments ; most of them are to be found in the modern Arab grave yards A or B, A containing more than B. In both they have been used to form the *haram* (graveyard enclosure) of the modern graves and have been put in quite often upside down. A few are to be found about 100 yards South East of the large ring tombs, where they are lying on the ground or built into the wall of a small one-roomed house not shown on the map. All the inscriptions were on the grey or yellowish stone described by Mr. Foley except one at B which was on the ordinary black stone of the surrounding hills. Unfortunately we could not decipher it ; it had no date.

The ruined village in Omek is some three miles E.N.E. of Nubt. It consists of about 100 houses in a narrow gully on the north side of which is a large outcrop of the stone used for the Nubt graves. No signs of gold mining or any other industry could be found ; there are no inscriptions and we could find no pottery. In fact, beyond showing where the inhabitants of Nubt got their tombstones from, the village yielded no information at all. The houses had in many cases two or three rooms and were of the same type of flat stone building as those usually found by the old gold workings. A feature of this architecture is the building into the wall of niches, usually about 2 feet square by 6 to 9 inches deep, which were presumably used as store cupboards or something of the sort.

Assuming, as I think we may, that these two villages were not built for the purpose of any particular trade, the problem of why they were ever built at all is not easy to solve. Local opinion holds that during the troubled times of the Muslim conquests, it was customary for people to build retreats in secluded corners of the hills, to which they and their flocks could repair when danger threatened on the plain. If so, it is curious that none have been discovered. All the other settlements which I have seen have been on old gold workings. Moreover, the situation of these two villages is not well adapted to defence, though it is to concealment. In fact it almost looks as though they may have been the headquarters of robber bands ; they are, too, within easy reach of the Suakin-Berber camel road, though whether this was used in early Mohammedan times I do not know ; there are ring graves most of the way along it from Suakin to Ariab.

Whatever the purpose of the village, it is clear that three distinct lots of people have inhabited it ; first the makers of the ring-tombs, then the Arabs who inscribed the tombstones and presumably used the pottery and who do not seem to have stayed very long, and lastly other Mohammedans. Whether these last were members of a rival sect who uprooted

he tombstones in religious fanaticism or whether they were illiterate Beja who used them in ignorance of what they were, we do not know, but probability supports the second alternative. The local legend given below presumably refers to the first Mohammedan occupation of the village and the fact that it is still remembered by the Beja seems to corroborate the probability that it was the Beja themselves who were turned out by the Mohammedans.

As regards the rock pictures, most of them are of cattle of the long-horned humpless breed. The true Beja breed is, according to my information, a short-horned beast with a marked hump. A long-horned humpless beast is also found among their herds and is said to have been introduced from either Arabia or Eritrea. Whether this is the prototype of the rock pictures or not we have no means of knowing. The Nubt cattle pictures show the same type of cattle as those at Onib, Nurayet in W. Diib, W. Nefirium near Derhib, Rawai and other places. The giraffe and the sitting man may help the archaeologist however.

With reference to the history of the city the following tale is current among the local tribes ; however it may savour of the purely legendary, it is perhaps worth recording not only as an amusing fairy tale but because such legends are often really aetiological myths woven to explain some historical fact.

The community was originally one of " Roumeen," who are said by some to have been black and of Abyssinian-like features and by others to have been of European colour and characteristics ; and there are supposed to have been a number of such communities from further North down to Tokar within measurable distance of the coast, but none very far inland.

The King of the Roumeen, so runs the tale, had three great possessions ; a sword that could cleave through rock itself, a grinding-stone that was harder than granite and could grind anything to powder, and a daughter who was the most beautiful in the world. About this time, which was long before Barakween, the founder of the Hadendowa, and the reputed ancestors of other Beja tribes, had entered the neighbourhood, an Arab tribe named the Baynhilalt (Bani Hilal ?) lived on the coastal plain near Suakin.

The son of the Baynhilalt Sheikh, hearing of the Roumeen king's daughter, went thither to see for himself, and sojourned some while, tending the Roumeen flocks and making surreptitious advances to the damsel.

The Roumeen, after a while, suspected him of having had an affair with her, and seized him ; trial by ordeal was decided on. Now the Roumeen were men of great stature and none could wield their well-buckets but themselves, such was the bucket's capacity. So the young man was brought

to the well at evening, given one of their *dalus* (buckets) and told, if he was innocent, to fill the troughs, for the flocks to water at, before morning. Then they left him. Sure enough he found himself baffled ; but he ran, when it was dark, to his ladylove, the king's daughter, who hurried out with him and, being of similar physique to her brethren, easily wielded the well-bucket and filled the troughs for him.

With the dawn came the Roumeen and were surprised to find the troughs full. However, they had suspicions of the truth, so went back to search, and sure enough found a splash of undried mud still on the lady's breast, which gave the show away. So they killed the young man.

When his father, the sheikh of the Baynhilalt, heard of it, he set out with his entire tribe to take vengeance. A prophetess of the Roumeen — a local Cassandra — saw lightnings in the eastern sky which she announced would devour the settlement and all its inhabitants ; the lightnings were, in point of fact, made by the tinders of the Baynhilalt host as they lit their evening fires.

The struggle took place close to the city, a mile or two up the valley to the Southward. Some say that the two communities suffered the fate of the Kilkenny cats ; others that some of the Baynhilalt survived and lived on for a time, but then wandered away and were never again heard of.

When the king of the Roumeen saw that all was lost, he was determined that at least no one should have his three great possessions. So he took the sword-that-could-cut-rocks and first cut off the head of his beautiful daughter ; he then went to the grindstone-harder-than-granite and with the sword clove it in two pieces, and finally struck the sword, point down, into the earth, which swallowed it up. The supposed site of the buried blade—an unimpressive dimple in the ground—is still shown, as is the cloven grindstone, a split slab of marble-like stone indistinguishable from many others lying around ; while the shade of the beheaded damsel or some more indefinable influence, is believed still to haunt the spot.

Such is the story. It is a pity that the Arabic tombstones examined, whose dates cover a period of just 50 years from 227 to 277 A.H. give no clue to the tribe of the occupants of the graves, whether Bani Hilal or otherwise. The legend, as such, obviously recounts a historical Arab conquest (presumably one that soon passed on) of the local pre-Muslim inhabitants, but only stimulates rather than allays speculation as to who these inhabitants were by dragging in the Roumeen, nor does it afford any solution of the question what was the attraction that led them to dwell in this particular place, which is neither strategic nor appears to possess gold or any other commercial advantage.

A NOTE ON THE FOREGOING

By

P. L. Shinnie.

There are eight tombstones from this site now in the Khartoum Museum (numbers 2765 — 2772). They are of value in so far as they bear dates, but the texts themselves throw no further light on the history of the place.

The details of them are :—

- 2765. Tombstone of Aisha bint Iesa al Rabya. Died 315 A.H.
- 2766. Tombstone of Hassan ibn Iesa. Died 153 A.H.
- 2767. Tombstone of Sharia ibn Abdullah. Died 277 A.H.
- 2768. Tombstone of Assuli (?) ibn Batuma. No date.
- 2769. Tombstone of Hasa bint Saad Yasin. Died 264 A.H.
- 2770. Illegible.
- 2771. Illegible. Died 149 A.H.

The main interest lies in the early date of these inscriptions, the tombstone No. 2771 must be the earliest dated Arabic inscription in the country.

What this Arab village was doing in the Khor Nubt at this early date, unless it was connected with gold working, is difficult to imagine, and a detailed search would be necessary before we could accept the view that there were no gold workings in the neighbourhood.

The period covered by the dated inscriptions (766 A.D. to 927 A.D.) was one of considerable Arab penetration of the area, and certainly during the earlier years it was the search for gold that brought them. Maqrizi gives a considerable amount of information about Al Omari, who coming from Egypt on a gold prospecting expedition in the middle of the 9th century, established himself as a virtually independent ruler of the area between the mouth of the Wadi Allaqi and the latitude of Abu Hamed. He was sufficiently powerful to be a source of concern to the Christian Kings of Dongola, who carried out indecisive campaigns against him in the region of Shanqir, which is probably to be identified with the stretch of river between Abu Hamed and Berber.

The Khor Nubt is perhaps rather far south for Al Omari and it may be that these gravestones are of immigrants from across the Red Sea. Some of the names certainly suggest an Arabian rather than an Egyptian origin.

**MEDICAL INVESTIGATIONS OF THE UNITED STATES NAVY
IN THE ANGLO-EGYPTIAN SUDAN 1948-1950.**

By H. Hoogstraal

Head, Department of Medical Zoology,
U.S. Naval Medical Research Unit No. 3, Cairo, Egypt.

During the past two years, residents of the Sudan have frequently been startled to find American naval personnel doing sea duty (foreign service in naval parlance) on their deserts and in their mountains and savannahs. We must admit that interior Sudan would strike almost anyone as a most implausible place in which to find American naval activity. Guests at our landlocked stations often regaled us with the latest rumors about what we were doing and why we were there, but as our work progressed, our motives and efforts were better understood and more appreciated.

In the latter part of 1947, Mr. Wendell Phillips, of the University of California, approached the Navy with a request that medical support be provided for an African paleontological and archeological expedition that he was then organizing. The Bureau of Medicine and Surgery offered to send a group of naval and civilian medical specialists to (1) care for the medical needs of the members of the expedition, (2) procure photographs, moving pictures and clinical specimens for teaching tropical medicine at the Naval Medical School, (3) gather host-parasite data and other scientific material, especially those with any relation to human diseases, for military and civilian institutions, and to do field research where indicated, (4) give naval teaching personnel broader experience in tropical medicine, and (5) gather epidemiological data on African diseases and any information on treatment and control of tropical diseases which would be of value anywhere in the world.

The caravan of the Naval Medical Science Group left Kom O Shim in the Egyptian Fayum on 17th February 1948 and arrived at Wadi Halfa from the west bank of the Nile on 1st March. There, under the expert guidance of Dr. Mohamed Ahmed Ali, the group studied the various diseases in the hospital, took X-ray photographs of patients, and collected specimens of the local vertebrate fauna and their parasites and of insects of medical importance. Among the more interesting of these were the chironomid flies that emerge in hoards from the Nile at certain seasons and

often cause asthma among the residents. Few entomologists or medical men throughout the world are aware that this family of flies has any such medical interest.

After about ten days at Wadi Halfa the group moved to Abu Hamed where the members observed other diseases that had not been present at Wadi Halfa, and collected more specimens. Simuliids or black flies, the carrier of the worm causing onchocerciasis, were found in the Nile and collected in large numbers for teaching purposes.

From Abu Hamed the group drove to Khartoum where it first began to appreciate the tremendous wealth of research possibilities in the Sudan, and after the trek from North Africa to South Africa had been completed the members were in unanimous agreement that they considered the Sudan the richest country that they had visited from the medical research standpoint and the one in which they would most like to work if given the opportunity. The friendly cooperation given by the Sudan Medical and Veterinary Services contributed immensely to our fund of knowledge.

Juba was the headquarters of the unit from early April to June, and in Equatoria Province the most valuable and interesting field work of all that done in Africa was accomplished. One group travelled as far west as Sources Yubo and made extensive observations and collections of the considerable variety of tropical diseases and of their treatment and control methods. An extensive photographic record of the diseases, especially of leprosy and onchocerciasis, was made here. The important Kodachrome training film on sleeping sickness in all its phases, cause, and control, was begun and later finished in other parts of Africa. Another group travelled eastward to Kapoeta and studied the elephant shrew and human diseases, especially kala-azar and hydatid disease, the latter of which is present at Kapoeta in probably greater numbers than anywhere in the world.

In June the group continued its trek southward from the Sudan, while Commander Ruebush, Hospitalman Lawless, and Mr. Terry boarded a plane with 104 elephant shrews from Torit and Kapoeta destined for America where further research was to be done on them. Early in July the writer, accompanied by Mr. Lawless, returned to Torit from Kenya to carry on further research with the elephant shrew and its parasite, and remained until September.

The elephant shrew research project had been requested by the Naval Medical Research Institute near Washington in the hope of finding a suitable small mammal for malaria research. In the past few years, as a result of work by British and American researchers, much of the previous concept of malaria has changed and the disease is now known to be a double one,

one phase of which occurs in the circulating blood, as everyone knows, and the other phase of which is found in the fixed tissues of the host. To increase the knowledge and especially to help in developing a perfect drug for the prevention and cure of human malaria it has become necessary, more than ever before, to have a small mammal which can be kept and will reproduce under laboratory conditions, and which, above all, harbors a malaria similar to that of humans. Brief notes in earlier literature had mentioned a malaria organism in elephant shrews and it was hoped that this animal and its disease might fill the requirements.

From our three months of work at Kapoeta, Torit, and Juba and from the research done in America on the specimens we sent back, it became evident that the elephant shrew was a short-lived animal with a nervous temperament that did not respond at all well to a laboratory habitat and refused to breed under unnatural conditions. Although the malarial organism in the blood bore a close resemblance to certain kinds of human malaria, its cyclic picture was so much more like that of the malarias known from other lower mammals that it was quickly concluded to have little direct value for research in human malaria. However its apparent intermediate position between the malarias of lower animals and those of humans indicated that it would be of great value to know more about the life cycle of this organism, what insect transmits it from elephant shrew to elephant shrew, and how the transmission is accomplished.

In order to investigate these problems, the writer and Mr. Lawless were assigned to the U.S. Naval Medical Research Unit at Cairo a few months after our return from Africa, with instructions to set up a field station at Torit. We were also instructed to search for blood parasites in other animals that might be of use in research. We returned to the Sudan in September 1949 and resumed our work at Torit. The work was well under way and facilities were being organized for the intensive phase of the research, which would have commenced with the rains in late April, when major changes in the overall research program necessitated closing the station without an opportunity for having accomplished this mission. Final evacuation of the unit was accomplished out of Juba on 25th April 1950.

Some of the many unknowns which we had attempted to answer remain as deep a mystery as they have always been. Until a considerable amount of research has been done on the malarias of lower animals many questions about human malaria will remain unanswered. With the world in its present unsettled state, and because of the perplexities of the problem and the expense and distances involved, it appears that it will be some time before our present insufficient knowledge of animal malarias is increased.

Problems carried on in conjunction with the elephant shrew research have in part compensated for the failure to achieve total results in the major project. A number of valuable internal and external parasites collected in the Sudan are now forming the basis for scientific papers by British and American scientists. Major Robert Traub of the U.S. Army Medical School is writing a paper on the fleas collected including new species ; snails collected in the Sudan are forming parts of papers being published by Dr. J. Bequaert of Harvard University ; the writer is studying and preparing for publication a report of his extensive collection of ticks from the southern Sudan, and the vertebrate collection of about two-thousand specimens, when completely studied and correlated with the parasite studies, will add to the knowledge of the distribution and species of African animals and the role they play in diseases. Dr. Clay G. Huff of the Naval Medical Research Institute has prepared a preliminary paper on *Plasmodium fallax*, a malaria from guinea fowls which we sent him from Torit. This organism showed up in very low densities in the birds under natural conditions, but when transferred to laboratory pigeons in America developed overwhelming infections useful for studies in the immunology of malaria. When Dr. P. C. C. Garnham of the London School of Hygiene and Tropical Medicine visited our Cairo laboratory recently we showed him a strange organism from the blood of hyraxes near Torit. This so excited his curiosity that he took it with him to London for further examination, and after considerable study decided that it represents a new genus and species of Piroplasm, which he is now describing for scientific publication. Dr. Garnham has already submitted a report on our African and Madagascan trypanosomes for publication. In addition, Dr. Amberson and Dr. Schwarz are incorporating the total results of the expedition in a Naval report.

The specimens and films accumulated on the 1948 expedition have provided the staff of the Naval Medical School with an unsurpassed collection, in addition to what it already had on hand, of visual aid teaching material still and motion pictures, insects, internal and external parasites, parasite hosts and pathological specimens. Duplicate collections have been donated to other scientific and educational institutions. Naval Medical instructors can draw upon a wealth of personal observations, and many a classroom discussion begins with, "Now when I was in the Sudan . . ."

The members of the several parties that visited the Sudan are grateful for the numerous courtesies shown them by the Government, and will always remember the many friendships made on this pleasant tour of sea duty.

**PUBLICATIONS IN PREPARATION OR COMPLETED ON U.S.
NAVAL FINDINGS IN ANGLO-EGYPTIAN SUDAN**

- GARNHAM, P. C. C. On a Collection of Trypanosomes from Southern Sudan and Madagascar, *Journal of Parasitology* (Pennsylvania) ; in press.
- GARNHAM, P. C. C. A New Piroplasm from the Sudan, *Journal of Parasitology*; in press.
- HOOGSTRAAL, H. Mission : Malaria. *Natural History* (New York), LIX, No. 3. March 1950, pp. 104-111, 140-141.
- HOOGSTRAAL, H. Notes on *Haemaphysalis* (Ixodidae) Ticks from Africa and Arabia, with a description of new species. In preparation.
- HOOGSTRAAL, H. Medical Relations of Ticks of the Ethiopian Faunal Region. In Preparation.
- HOOGSTRAAL, H. The Ticks of Anglo-Egyptian Sudan with Special Reference to Their Disease Relations and to Equatoria Province, In preparation.
- HOOGSTRAAL, H., C. G. HUFF, & D. K. LAWLESS. A Malarial Parasite of the African Elephant Shrew, *Elephantulus rufescens dundasi* Dollman. *Journal National Malaria Society* (S. Carolina), December, 1950. Vol. 5, No. 4 BR. 293-306
- HOOGSTRAAL, H. & K. L. KNIGHT. Observations on *Eretmapodites silvestris conchobius* Edwards (Culicidae), in the Anglo-Egyptian Sudan. *American Journal of Tropical Medicine* ; in press.
- HUFF, C. G. Experimental Infections of *Plasmodium fallax* Schwetz Isolated from the African guinea fowl, *Numida meleagris major* Hartlaub ; *Journal National Malaria Society* V. 9, No. 4, December, 1950, pp. 307-319.
- PHILLIPS, W. Africa from Nubia to Turkana. *The Scientific Monthly* (Washington, D. C.) LXIX, No. 4 October 1949. pp 262-269.
- TRAUB, R. On the Higher Classification of fleas (Siphonaptera), with Descriptions of new and poorly known Species. In preparation.

A SCORPION IN CAPTIVITY

By Dr. Mansour Ali Haseeb.

Stack Medical Research Laboratories.

The following are observations on one scorpion caught at Omdurman and kept in a glass jar (20 cm. long x 6 cm. diameter) for a period of two hundred and forty days.

The scorpion, a member of the *Buthus quinquestriatus* species, the commonest scorpion at Omdurman, was captured on the night of August 7th, 1950. It was immediately put in a glass container which was then closed with a metal cork-screw cap. During the manipulation, about two ounces of earth were accidentally collected in the jar together with the scorpion. The glass jar was put aside on an out-of-the way shelf for observation. Neither food nor drink was supplied to the scorpion.

On the morning of September 25th, 1950, after forty-eight days in captivity, the scorpion gave birth to ninety-nine little white scorpions, complete in every detail. They were found swarming about in the glass jar and some of them clustering on the back of the mother. As days went on the little scorpions gained in size and their white colour gradually changed to yellow. Both the mother and its young ones remained in good health till the evening of October 15th 1950. On the following morning it was discovered that all the young scorpions (twenty days old) had disappeared. Not a single young scorpion, or even parts of one, was to be seen. As the glass jar was found standing intact on its shelf and with its cork-screw lid well on, it was assumed that the young ones had been eaten by their mother.

The mother scorpion was further detained for a period of a hundred and seventy five days, during which she remained perfectly well. No decrease in the amount of earth accidentally collected in the jar was observed. She died on 9th April 1951.

DISCUSSION AND CONCLUSIONS.

These observations throw light on the following points :—

1. **GESTATION PERIOD** : In this case it is more than 48 days.
2. **CANNIBALISM** : The scorpion ate her young ones which were 20 days old and then remained in perfect health for more than five months. This is not in accordance with the common belief in the Sudan that the mother scorpion is devoured by her young ones immediately after giving birth to them.
3. **FOOD** : Scorpions can do without water even during the hot season in the Sudan, for a period of eight months. They can also do without eating insects or spiders for the same time. The common belief in the Sudan that scorpions eat earth is not confirmed by the present observations.



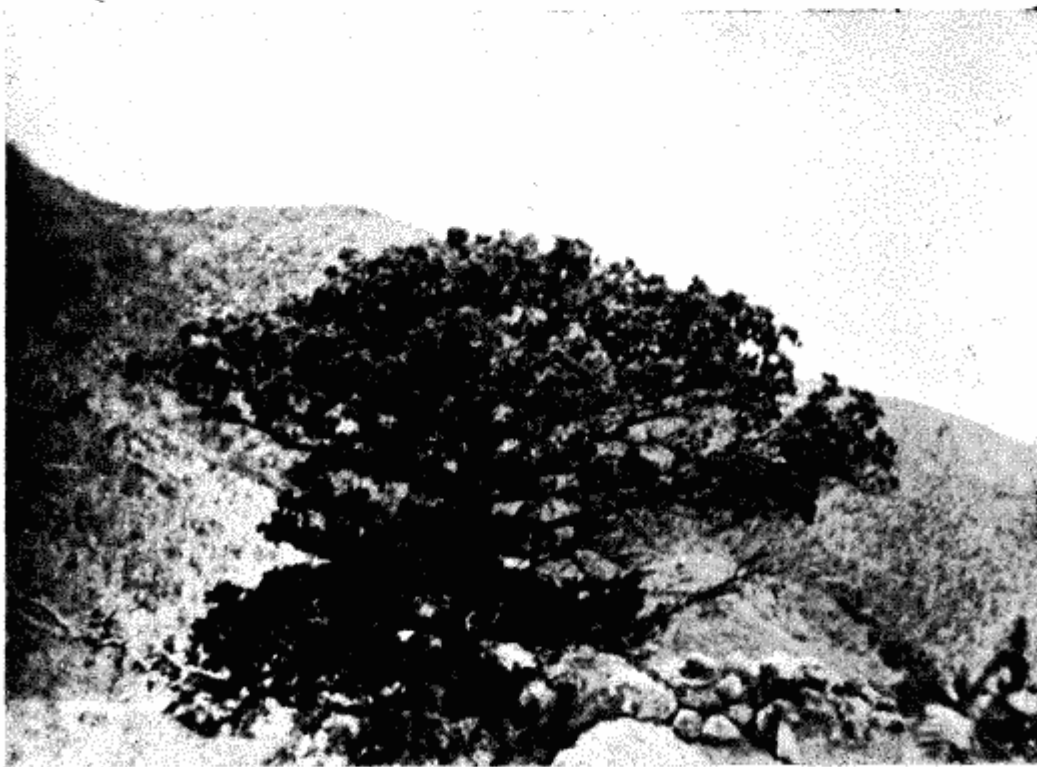
Relic gallery forest tree, already scorched at the base and doomed to perish within a few years.

The next stage - blackened stumps of once tall forest trees.





Forested slopes of Mt Lotuke - the light - coloured flattish - topped trees are *Albizzias*. Fireswept *Protea* grassland in left foreground.



Lotuke - old gnarled cedar (*Juniperus Procera*) protected from fire by growing among rocks.



In the plains at the foot of the Didinga Hills, Clearance for cultivation along the bed of a khor.



Destruction of forest along stream beds, slopes of Lotuke, between 4000 & 5000 ft. To the right remnants of gallery forest, to the left an area cleared for cultivation, with the whitened skeletons of old trees, and rock beginning to show through.

MOUNT LOTUKE, DIDINGA HILLS.

By J. K. Jackson

Silviculturalist, Sudan Forests Department

The following notes describe a short visit made to Mount Lotuke in late March 1950. The south face of the mountain was skirted, and the summit climbed, but the other faces were not visited.

General Description.

Lotuke lies at the south-east end of the Didinga Hills, of which it is the highest peak ; it is, however, separated from the main block of the hills by a rather low pass, and thus stands rather by itself. In general shape it is conical, but on closer view the summit consists of a ridge about two miles long beginning at the survey summit and running S.E. From this ridge a number of streams flow both to the N.E. and the S.W.

The vegetation.

The vegetation may be very broadly classified into the following zones ; the savannah vegetation and forests will be dealt with separately :

(a) Savannah zones.

(i) From the plateau at the foot of the hills to about 4500 ft. the soil is heavily eroded, and in places very stony. Characteristic tree species are *Terminalia brownii*, *Grewia* sp., *Teclea* sp. and there is an undergrowth of weak shrubs e.g. *Acacia ataxacantha*, *Acalypha* sp., *Phyllanthus* spp. This shrub vegetation may be the result of over grazing. On the whole the vegetation of this zone is an arid type.

(ii) From about 4500 ft. to 6000 ft. there is a more mesophytic type of savannah, one of the characteristic trees being *Combretum gueinzii*. Its associates include *Strychnos innocua*, *Acacia "stenocarpa,"* *Gymnosporia senegalensis*, *Gardenia jovis-tonantis*, *Lonchocarpus laxiflora* and *Stereospermum kunthianum*. In the higher part of this zone *Faurea speciosa* begins to appear. The flora is very similar to that of the slopes of the Imatong mountains at this altitude.

(iii) Above 6000 ft. to the edge of the *Podocarpus* forest the dominant tree species is *Protea abyssinica* with *Syzygium cf guineense*, *Hymenodictyon floribundum* etc. but the most interesting feature is the presence of relict trees of the Pencil Cedar, *Juniperus procera*. Their significance will be discussed later.

(b) Forests.

Until the *Podocarpus* forest at about 7000 ft. is reached the forests (at least those seen on our route) are represented by fragments and relict trees only.

In the valley of the Kurumo at about 4200 ft. a moribund *Mimusops*, and a patch of *Trema guineensis* showed where there had once been a strip of hillside gallery forest. (*Trema* commonly springs up in the Imatongs after forest has been felled or burnt). Further up the valley of the same stream there was also a fragment of forest with *Mimusops* sp. and *Polyscias fulva*; on its edge were *Celtis* sp., *Ritchiea* sp., and *Dombeya*. Another valley had *Albizzia maranguensis* as the dominant tree, with *Celtis* sp., and *Maba* sp.

The *Podocarpus* forest is, in general, similar to that of the Imatongs. At its lower altitudes it is very mixed with *Olea hichstetteri*, *O. welwitschii*, *Pygeum africanum*, *Syzygium* sp. aff., *S. gerrardii* etc. Higher up the *Podocarpus* is purer, but tends to be stunted and overgrown with *Usnea* lichen.

The significance of the Juniper.

The only specimens of *Juniperus procera*, the Pencil Cedar, seen were old relict trees, the trunks of which had been protected from fire by the trees growing between rocks. They were seen between 5,500 and 7,000 ft. altitude.

Now in Kenya the Pencil Cedar is characteristic of a type of dry forest which often surrounds the wetter *Podocarpus* forest in a broad fringe. Its characteristic associate is the brown olive, *Olea chrysophylla*. This cedar-brown olive forest is to some extent a pioneering association, and if protected from fire gradually advances into surrounding grassland. The juniper will not regenerate itself in mature forest, but is followed by *Podocarpus* and similar types.

I did not see brown olive on Lotuke, but I have seen it elsewhere in the Didingas, for instance near Nagichot, so it may once have existed on Lotuke also.

In Kenya the cedar-brown olive forest is extremely susceptible to fire. In the large forest reserve on the west slopes of Mount Kenya I drove through an area of between three and four thousand acres which had been burnt a few years before, despite the presence in the area of a large forestry staff and fairly elaborate fire-prevention organisation.

It seems therefore as if the history of these junipers on Mt. Lotuke may have been as follows : they are the remnants of a large belt of *Juniperus-Olea chrysophylla* forest which has been almost completely destroyed by

fire. This fire would have swept through the juniper forest till it reached the much moister and less inflammable *Podocarpus* forest, which would not have been burnt except for slow encroachment at the edges. Any possible regeneration of juniper has been prevented by annual fires, and the only survivors are those protected by rocks.

Recession of the *Podocarpus* forest is taking place far more slowly, due to its much moister nature. However it *is* receding, and a recession of a few score yards a year will, in the course of time, result in a very considerable area of forest being destroyed.

Destruction of the Forest.

In addition to the disappearance of the juniper forest, the remaining gallery forests on the hillside are being destroyed at a very rapid and alarming rate. This is due to clearance of the areas along beds of streams for shifting cultivation, and to fierce and uncontrolled fires raging over the hillside almost annually (sporadic fires were burning during my visit between March 28th and 31st). The photographs which accompany this note demonstrate what is happening much better than a long description can. The destruction of the forest along the streams is not confined to a few isolated localities, but is almost universal. This destruction, especially as it is concentrated along the stream beds, cannot fail to have a most serious effect on water supplies, and is greatly helping on the desiccation of the country.

Remedies.

Local rules prohibiting cultivation near stream beds, or controlling burning, are almost certain to be ineffective. The only real solution is to make the whole of the mountain above about 3,500 ft. a forest reserve. This should be done as soon as practicable without prejudice to the reservation of other parts of the Didinga Hills, such as was suggested by Mr. Marjoribanks in the note he wrote on his visit to Nagichot in 1946. Not many people actually live in this area, but they do tend to come up into it to cultivate, and this is what is doing the damage.

BOOK REVIEWS.

AGRICULTURAL SCIENCE IN THE SUDAN :

A BIBLIOGRAPHY WITH ABSTRACTS. BY R. L. Knight and
B. M. Boyns. Arbroath, T. Buncle and Co. Ltd. 1950. 20/- or 975 m/ms.

One's first reaction on looking through this excellent bibliography is one of surprise at the amazing amount of material which has been published about Sudan agriculture and related topics. The book comprises a list of almost 1000 references, the earliest dated 1826 and the latest 1948, arranged in alphabetical order of author's names, all but 40 of which have been published during the last 50 years. It is thus primarily of value in that it presents to the world a record of the achievements of research into Sudan agricultural problems over the last half century, a record of which the Sudan may well be proud.

The authors are also to be congratulated for their valuable contribution to the working library of all administrative and agricultural officers serving this country. Many of the papers referred to are abstracted, especially those emanating from the research station at Wad Medani, and where possible the author's summary has been included. The literature dealing with cotton in the Sudan is extensive and occupies the major part of the book : the abstracts of these papers form a most useful summary of the information available on the subject.

The authors have obviously had difficulty in selecting papers worthy of notice and have perhaps exceeded the limits defined in their title by the inclusion of references of a purely geographical or descriptive nature. Papers on forestry, ornithology, game, dietetics etc. are also listed, giving the book a much more general appeal than the title would indicate. At the same time one wonders why, whereas many papers dealing with Hydrology have been listed, no reference has been made to Irrigation Department reports, and why the reports of Tothill and Jewitt on the Zande area receive no mention, but has one any right to question a few inevitable omissions when one has been given so much ? It would perhaps have been desirable for some information to have appeared in the book as to the availability or otherwise of the more important papers in Sudan libraries : research workers especially will wish to consult the original papers in many cases and some reference as to the whereabouts of these papers might have been of value.

The book will prove of immense value to all who are interested in the development of the Sudan, which depends so largely on agricultural progress. Together with Tothill's *Agriculture in the Sudan* it provides a foundation of knowledge gleaned over the last 50 years on which future agricultural research and development must be based, and one can only hope that successive editions will eventually appear which will keep the book reasonably up to date.

L. S. Cobley.

AL-TARIKH AL-HARBI LI 'ASR MUHAMMAD 'ALI AL-KABIR. By al-Qâ'immaqâm 'Abd al-Rahmân Zakî. Cairo, Dâr al-Ma'ârif Press, for the Royal Society for Historical Studies, 1950. pp. x, 558.

The apotheosis of Muhammad 'Alî Pasha marks a current phase of Egyptian historiography, and this study of the great Wâlî's wars commemorates the centenary of his death. Though he was an Egyptian only in the sense that he lived there from early manhood, Egyptian sentiment has surrounded him with an Arab aura much as the English, in similar mood, converted their French-speaking Norman conqueror into an English king.

Only one chapter of this book directly concerns the Sudan, though the entire work is heavy with Sudanese implications. The Pasha's victorious troops, Sudanese among them, strode across the Near East: from Arabia and the Sudan to Crete, Greece and finally through the Cilician Gates to within a hundred miles of Constantinople. Among these far-flung wars the penetration of the Sudan was a corporal's affair. The campaigns of Ismâ'il Pasha and Muhammad Khusraw the Bey Daftardâr were carried out by bands of Arab irregulars—Mugharba, Hawwâra, 'Abâbda—stiffened by Turkish bashi-bûzuq and artillery, and led by officers of the Turkish-speaking ruling class of Egypt. These were the last operations to be conducted by the old Egyptian army before the coming of the *nizam al-jadid*, trained on French lines. To the Sudanese they were important events for they led to the introduction of an Ottoman type of administration, moulded by Egyptian usages. They brought the ultimate, if shadowy, jurisdiction of the Sublime Porte to the frontiers of Pagan Africa.

Though he reveals little that is not already known to readers of Douin's *Penetration* and Marshal Weygand's *Histoire militaire* (the latter untrustworthy on the Sudan campaigns), Colonel Zakî Bey's work is the first presentation of the subject in the Arabic language written from the strictly military angle by a soldier who knows his Sudan. Although commemorative volumes are not the best medium for exercising the critical faculty,

~~the~~ author has avoided the excessive blarney which has disfigured so much of recent literature about the Sudan. Muhammad 'Alī was indeed a great man but, like all of us, he was a son of his times. A consistent note running through his directives to commanders in the Sudan was the urgent need of providing negroes for his new regular forces, and that meant slave raiding. To have white-washed the Pasha with a layer of twentieth-century euphemisms would have been historically unpardonable.

It is casting no slur on the veritable revolution which has taken place in Egyptian printing and publishing of recent years to add that maps are still an occasional weak feature of book-production. By contrast this volume, with its relevant maps and clear type-face, does honour to author and printer alike.

A small misunderstanding might well be removed from a second edition. The term *hukumdar* (Arabic *hikimdar*, sometimes *hakimdar*), as used in the Sudan signified a governor-general. The earliest Egyptian rulers were not governors-general in the accepted sense but simply military commanders in their respective areas. Hence Ismā'il Pasha and 'Uthman Bey Jarkas were each officially designated *Sinnar ser'askeri*, and the Daftardār was *Kurdufan ser'askeri* until he took over the combined command on Ismā'il's murder in 1822. No established central government existed in the Egyptian-occupied Sudan until thirteen years after the start of the invasion. The first governor-general with full civil and military functions was 'Alī Khurshid who since 1826 had been merely governor of Sennar, *Sinnar naziri*. Not until 1833 was he appointed to rule over the whole occupied Sudan, *aqalim sudaniye muduru*, a designation changed two years later to *Sudan hukumdari*. Behind this apparently trivial technicality is a real and serious distinction.

R. L. Hill

SOCIAL ANTHROPOLOGY. By E. E. Evans-Pritchard. Cohen and West Ltd., London, 1951. 8/6.

This little book reproduces six lectures given on the B.B.C. Third Programme in 1950 and is intended to give a short survey of the form of study which the author himself has done so much to develop—to a large extent through field work in the Sudan.

Social anthropology is to be distinguished from ethnology and from prehistoric archaeology (which deal primarily with culture and reconstruction of history respectively) in that it seeks to demonstrate patterns of social behaviour. There has been considerable difference and development of opinion on the subject and Professor Evans-Pritchard traces its history

from the Age of Enlightenment through various phases in the XIX Century. He then describes the type of field work that is normally carried out and he is particularly careful to stress his view that personal work in the field is essential to the professional anthropologist.

Perhaps the most important point in the whole book is the statement of the author's opinion that social anthropology belongs rather to the humanities than to the natural sciences, in which he differs from some others. He does not believe that anthropological studies are of *direct* value in most cases to administration. At a time when the economist and the social scientists both proffer theories and remedies for the tangles in which the unhappy world now finds itself, it is a relief to turn to a study that may be as irrelevant as that of Greek particles or Virgil's botany, since the fate of peoples great and small seems to be settled more often by crude human passions and ambitions than by scientific reasoning.

T. H. B. Mynors.

THE MAHDIYA. By A. B. Theobald. Longmans, Green & Co. London 1951. Pp. 273. 21/-.

It is remarkable how the spate of books about the Sudan published at the turn of the century, mainly military histories and reminiscences, has been followed by half a century of neglect, apart from a small group of books on Gordon which appeared twenty years ago. Now comes Mr. Theobald to refresh our memories about an incident which momentarily loomed large for the British nation at the end of fifty years of peace and which changed the destinies of the Sudanese people, but which is in itself quite a minor affair when viewed against the background of African history and world affairs.

This is a well produced and readable book, though the author's style is rather heavily dramatic for serious history. The published sources consist almost entirely of works either by those who had suffered from the Mahdia or by members of the various military expeditions sent against it. Mr. Theobald has obviously set out to try to give a more balanced account of the period and a fair picture of the Mahdist attitude as something less crude and barbaric than it has sometimes been alleged to have been. But he has rested his book very largely on these published sources and he would make no claim that his researches have uncovered any startling new facts or revealed any novel aspect of the story. As the last eyewitnesses are fast disappearing it is a pity we cannot learn more about life and work under the Mahdiya and about conditions in the provinces as well as in Omdurman. It seems doubtful whether we shall learn much from Arabic documents still to be deciphered.

In his anxiety to be fair to the Sudanese point of view (cf. pp. 143-4 giving the background to the rule of the Khalifa) Mr. Theobald is at times less than fair to their opponents, whose actions likewise were conditioned by a knowledge and outlook that may seem to us nowadays narrow, unfair or absurd. He is curiously hard on Neufeld, and his criticisms of the military operations hardly take into account the disintegration of the old Egyptian Army after the wretched affair of 'Arabi Pasha, and the little opportunity before those days for military experience for British officers. If it was desecration for Kitchener to destroy the Mahdi's tomb, he also it was who founded Gordon College to which the Sudanese owe so much: not all Sudanese regarded it as a "national affront." And when (p. 47) the author writes "...the Sudanese people, tribal feuds and sectarian divisions forgotten, were on the march..." it must be remembered that to the end Mahdism never did forge the conglomeration of tribes into a "national" unity. Many were believers, many were opportunists, some were coerced: there was a constant ebb and flow. It is absurd to stigmatise as "treacherous" (p. 205) the Sheikh at Dongola who preferred Kitchener to the Khalifa, and in general events would probably have taken a very different turn but for the astounding folly of the Hicks expedition.

Indeed one of the best commentaries on the whole episode, but one that is seldom suggested, is the remarkable way in which the whole movement collapsed and was followed directly by widespread tranquillity, apart from a few isolated outbursts of religious fervour of purely local significance. And this despite rule by "foreigners" and despite the prohibition of slave raiding and the steady disappearance of domestic slavery, the effect of which on social and economic life in the Sudan has never yet been evaluated but undoubtedly was considerable. It is a pity that 1898 is always taken as a hard and fast dividing line, which in many ways it was not. The Mahdiya lacked the two chief catalytic agents, education and economic development: hence life was little changed.

Is there truth in the suggestion that the movement was encouraged by the slave-trading interests, such as Elias of El Obeid, or the Danagla (most of the other riverain tribes were against it)—just as the nationalist and revivalist movement of Mahatma Gandhi was backed by Indian industrialists, for was not the threatened slave-trade the chief "industry" of the country? How far can we represent the movement as typifying the well-known antithesis of the "Desert" against the "Sown"? For a long while it halted in the wilds of the West before moving down to the river, where towns and antagonistic tribes were roughly dealt with: the agriculture of the riverain belt was bled to feed the armies drawn mainly from the semi-nomad peoples of the West. Mr. Theobald deplors the

failure of the Khalifa to send adequate forces to the invasion of Egypt or to meet Kitchener's advance at an early stage ; may not the reasons be his mistrust of the riverain people (he had to slaughter the people of Metemma) and the inability of predominantly Baggara leadership to cope with a strange type of warfare in alien surroundings.

In *Islam in the Sudan* Mr. Trimingham has given us a scholarly and penetrating analysis of Mahdism past and present which should be read to balance Mr. Theobald's superficial and romantic account (pp. 43-4) and to permit of appreciation how heretical a creed it is for orthodox Islam (here summarily dismissed as "vested interests"). The attempt to appoint Al Senussi as one of the Mahdi's Khalifas may surprise those who regard the Sudan in isolation and do not realise how the West, especially Darfur, was until recently in close religious and economic contact with North Africa direct, where the mystical doctrines of the Senussi sect had gained widespread acceptance. It should also be borne in mind that although the immediate causes may have been local, the Mahdist movement in the Sudan was but one of a series of such movements throughout the Muslim world in the latter part of the 19th Century, from the Kabyle insurrection in Algeria (in 1871) to Afghanistan, Turkestan, and the Dutch East Indies—product of the revivalist movements in Islam dating from the 18th Century and of the increasing contact with the alien and uncompromising culture, religion and economics of Europe. It was just at this period too that the fiery reformer Jamal al Din al Afghani was preaching in Egypt and Syria.

One may not blame Mr. Theobald for not doing what he did not set out to do, but one must regret that the Mahdia still awaits treatment in a wider context, with less concentration on military affairs (which in these days appear pretty insignificant) and with due attention to doctrinal and social issues. It is probably a story that cannot be told without unconscious (or conscious) bias : it is certainly wrong in any event to dwell too much on it except as the origin of the regrettable political and religious differences which at present bedevil and endanger the prosperity and progress of the Sudan.

One correction may be noted, for which I am indebted to Mr. K. D. D. Henderson : the Khalifa 'Abdallahi is buried at Abu Rukba, not Sherkeila (p. 25).

T. H. B. Mynors.

OTHER BOOKS RECEIVED.

SUDAN GEOGRAPHY. By R. A. Hodgkin. Longmans, Green & Co., London, 1951.

A new and revised edition of the school primer reviewed in Volume 29, Part 1. In the absence of up-to-date descriptions of this country may

be recommended even to adults who want a simple description of the life of the country, though perhaps it falls between two stools by trying to cater for too wide a range of reader.

NOTES PRISES CHEZ LES BISHARIN et les NUBIENS D'ASSOUAN.

Par L. Keimer. Extracted from Bull. de l'Inst. d'Egypte, XXXII, 1949/50.

Notes on a peculiar palm (*Medemia argun*), the Hyrax, Sudanese skin shields etc.

SISTEMI MONETARI AFRICANI. By G. Tucci. *Rivista di Etnografia Napoli*. 1950.

The author first deals with the development from barter to the use of currency, as the exchange of goods leads to the growth of trade ; then he deals with the various forms of currency found in Africa. The Sudan figures for the use of iron in various forms.

CONVERSION AND THE POLL TAX IN EARLY ISLAM. By D. C. Dennet, Jr. Harvard Univ. Press, Cambridge, Mass. 1950. 2 1/2 Dollars (16/-).

This is a most painstaking study of the system of taxation as it existed in the first two centuries of Islam. Although the Sudan is, of course, not concerned, the chapter on Egypt will appeal to anyone who has to deal with direct taxation in the Sudan of today : the papyri reveal some all too familiar stories of over and under assessment, double listing, absenteeism and the like.

CORRESPONDENCE

The Editor, *Sudan Notes and Records*,

Sir,

Mr. Henderson's letter in your last number was written before Mr. Crawford's "The Fung Kingdom of Sennar" appeared, but it, like the book, brings a breath of common sense into the discussion of Fung origins, which has bedevilled so much writing on the history of this country in the last few years.

But the discovery which may well supply the final answer was of course unknown to him when he wrote. This is the identification of Fung pottery at Abu Geili by Crawford. This pottery has now also been found at a number of sites along the Blue Nile from Arbagi to Roseires, in what might be called the traditional Fung land.

This discovery gives us a new and accurate method of finding places inhabited by the Fung, and I should like to suggest that the time has come to cease fanciful linguistic speculations and reliance on half remembered tribal traditions, and to do some work in the field to establish the distribution of this pottery. This will do more to lead us to the homeland of the Fung than fine-spun arguments based on fancied linguistic resemblances.

Yours etc.

P. L. Shinnie.

BOXALL & Co. LTD.

Agencies :
PORT SUDAN
EL OBEID
NAHUD
RAHAD
UM RUABA
TENDELT
ETC.

TRADE MARK

Codes:
A.B.C. 5th & 6th
BENTLEY'S
LIEBERS
MARCONI
WESTERN
UNION
UNIVERSAL
TRADE
PRIVATE



Head Office : KHARTOUM

Telephone No. 2039 P. O. Box 1

Cablegrams : "BOXALL"

WORLD'S LARGEST SHIPPERS OF GUM ARABIC

EXPORTERS of Cotton, Dom Nuts, Beeswax, Pulses, Oilseeds, Oilcakes, etc.
IMPORTERS of Cotton, Woollen and Silk Piece Goods, Tea, Coffee, Matches,
Rice, Soap, etc.

Agents in the Sudan for :

GOODLASS, WALL, & CO. LTD.

Manufacturers of Highest Grade Paints, Enamels, Varnishes and
Cellulose Lacquers.

FISSK TIRE EXPORT Division of United States Rubber Co.

The most practical and safest tires.

HEINEKEN'S BEER — ABDULLA CIGARETTES

YORKSHIRE INSURANCE CO. LTD.

You can't afford to be without the

SUDAN STAR

for the latest

- **INTERNATIONAL AND LOCAL NEWS**
 - **SPECIAL FEATURES AND PICTURES**
 - **INFORMED ARTICLES ON ALL TOPICS**
 - **SPORT** • **GOVERNMENT NOTICES**
-
-
-
-
-

Amongst Others
S. & S. VANIAN LTD.
Represent

The Following British Firms in the Sudan :—

Imperial Typewriter Co. Ltd.

Mappin and Webb Ltd.,

Slazengers Ltd.,

Rolex Watch Co. Ltd.,

Lincoln Benett Co. Ltd.,

Saxone Shoe Co. Ltd.,

Dunlop Rubber Co. Ltd.,

(Footwear & Clothing Divisions),

Alfred Dunhill Ltd.,

Parker Pipe Co. Ltd.,

The Gramophone Co. Ltd.,

Marconiphone Radio Co. Ltd.,

Thermos (1925) Ltd.,

Rolls Razor Limited.,

Jantzen Knitting Mills Ltd.,

For

Typewriters, Silverware, Sports Goods, Radios, Gramophones

Records, Watches and Clocks, Cutlery, Hats and Helmets

Toilet Requisites, Boots and Shoes, Swimwear

and Sportswear, Smokers Requisites,

etc., etc., etc.

General Tel. 2150

—

Office Tel. 2600

Tel. Address: VANIAN, Khartoum.

P. O. Box 66, Khartoum.

GELLATLY HANKEY & CO., (SUDAN) LIMITED.

In The Sudan Since 1887

Head Office : KHARTOUM

Branches:

PORT SUDAN, SUAKIN, TOKAR, WAD MEDANI, EL OBEID

WADI HALFA

HODEIDAH (YEMEN)

ASMARA, MASSAWA, ASSAB (Eritrea)

DJIBOUTI (French Somaliland)

ADDIS ABABA (Ethiopia)

CAIRO (Egypt)

**Shipping - Passage - Forwarding
Insurance**

Importers - Exporters

**GELLATLY, HANKEY & CO.
(Engineering) LTD.**

MOTOR AND GENERAL ENGINEERING AGENTS

Agents :

**GELLATLY, HANKEY AND CO., (Saudi Arabia) LTD.
JEDDAH and YAMBO.**

GELLATLY, HANKEY AND CO. LTD., LONDON.

Head Office : 1, Lloyds Avenue, E.C. 3.

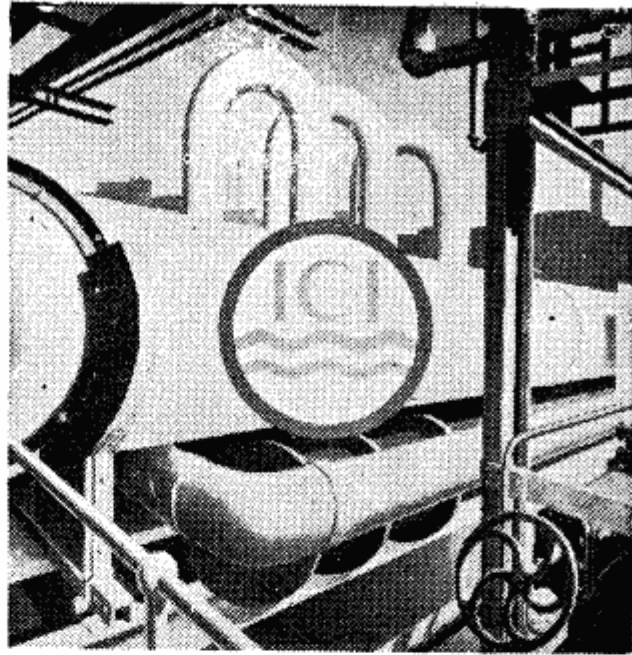
West End Office : 23, Pall Mall, S.W. 1.

LIVERPOOL. MANCHESTER. GLASGOW,

GELLATLY, HANKEY AND CO. (France) S.A., MARSEILLES

GELLATLY, HANKEY AND CO. (Belgium) S.A., ANTWERP

GELLATLY, HANKEY AND CO., Ltd., HAMBURG.



THIS is the symbol of Imperial Chemical Industries, the great British chemical combine known familiarly throughout the world by its initials "I.C.I.". Formed in 1926 by the amalgamation of four famous companies -- Brunner Mond & Co. Ltd., Nobel Industries Ltd., The United Alkali Co. Ltd., and British Dyestuffs Corporation Ltd., -- I.C.I. is today a public company with an issued capital of about £. 84,500,000, operating 80 factories, employing 100,000 men and women and producing no less than 12,000 different products. The variety and range of its products are greater than those of any other manufacturer of chemicals and its sales organisation is world-wide. It is one of the three biggest manufacturers of dyestuffs and organic chemicals and one of the largest producers of non-ferrous metals and heavy chemicals in the world. I.C.I. spares no money or pains to prosecute the intensive long-range research which enables it to keep ahead of competitors and leads to the great discoveries of the past two decades. It is a guarantee that the most skilful work in the laboratory is linked with characteristic British quality in the factory. Wherever you see the I.C.I. symbol you can be sure it stands for the best that chemical industry can produce.

REGISTERED
TRADE MARK
OF I.C.I. LTD.,
LONDON, ENGLAND.



IMPERIAL CHEMICAL INDUSTRIES

BLACKWELL'S

BOOK SEL LERS

Now available

Catalogue No. 561

AFRICANA

Free on request

**BROAD ST., OXFORD
ENGLAND.**

MIDDLE EAST PRESS

Specialists in

**PHOTOGRAPHIC
REPRODUCTION**

Printers of "The Sudan Star," "El Sudan Fi Usbu," "Southern Sudan Newsletter," "Journal of the Senior Civil Servants' Association," and "Sudan Notes and Records."

**P. O. B. 593
KHARTOUM**

TELEPHONES 2567
4055

NATIONAL BANK OF EGYPT

Incorporated in Egypt. Liability of members is Limited:

Established by KHEDIVAL DECREE of 25 June, 1898, with the exclusive right to issue Notes payable at sight to Bearer.

In 1939 (ratified 10 Aug., 1940) new charter granted for 40 years.

Head Office : CAIRO

Commercial Register No. 1 Cairo

oOo

CAPITAL (Fully paid) £ 3,000,000

RESERVE FUND . . . £ 3,000,000

oOo

Every kind of Banking Business transacted

OFFICES IN EGYPT

CAIRO (4 Offices), **ALEXANDRIA**, Abou-Tig (Sub-Agency to Assiut), Assiut, Assuan, Benha, Beni-Suef, Chebin-el-Kom, Damanhour, Deyrout (Sub-Agency to Assiut), Edfu (Sub-Agency to Luxor), Esneh (Sub-Agency to Luxor), Fashin (Sub-Agency to Beni-Suef), Fayoum, Heliopolis (Cairo), Ismailia (Sub-Agency to Port Said), Kafr-el-Zayat (Sub-Agency to Tantah), Keneh, Luxor, Maghaga (Sub-Agency to Beni-Suef), Manfalout (Sub-Agency to Assuit), Mansourah, Mehalla-Kebir, Mellawi (Sub Agency to Minieh), Minet-el-Gamh (Sub-Agency to Zagazig), Minieh, Port Said, Samalout (Sub-Agency to Minieh), Sohag, Suez Tantah, Zagazig.

OFFICES IN THE SUDAN

KHARTOUM, El-Obeid, Omdurman, Port Sudan, Tokar (Sub-Agency to Port Sudan) Wad-Medani.

LONDON OFFICE :

6 & 7, KING WILLIAM STREET, E.C.4

The best of all . .



World famous since 1890, Rothman's De Luxe cigarettes are made from only the finest tobaccos and carefully blended to please the discriminating smoker.

Available in:-
Round tins of 50 -

Rothmans
De Luxe
Virginia

MADE IN ENGLAND
ENGLAND'S LUXURY CIGARETTE

Sole Distributors:— Mitchell Cotts & Co. (Middle East) Ltd.

Wingate Avenue Khartoum