

"The Effect of Urbanisation on Health in  
a mining area of Sierra Leone".

by

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## PREFACE

Preliminary work on this study of the effect on health of urbanisation in a tribal community began in October 1958 in Edinburgh.

Field work was carried out in the Northern Province of Sierra Leone in two phases.

The first part, a study of the town of Lunsar lasted from April to December, 1959. The second part, consisting of a survey of four villages in neighbouring chiefdoms was undertaken during the dry season from January to April, 1961.

This study of health, forms part of a joint project on urbanisation in Sierra Leone, being carried out under the direction of Dr. Kenneth Little, Head of the Department of Social Anthropology, and with the collaboration of Professor J.H.F. Brotherston, Dean of the Faculty of Medicine and Head of the Department of Public Health and Social Medicine in the University of Edinburgh. The project is supported by generous grants from the Nuffield Foundation.

I should like to express my gratitude to members of the Committee on Co-operation and Research in the Social Sciences, of the University of Edinburgh, for their encouragement and facilities, and for leave of absence from the Department of Public Health and Social Medicine, and Social Sciences Research Centre. I am also grateful to the Nuffield Foundation for its generous support in the field.

My two colleagues from the Department of Social Anthropology were Dr. James Littlejohn and Dr. David Gamble, and I wish to thank them for their wholehearted collaboration in our inter-disciplinary research. Without the kindness, co-operation and hospitality shown to me by the Administrative and Medical Staff of the Sierra Leone Development Company in Britain, in Freetown and at the mines at Marampa, it would not have been possible to carry out the project in its present form. I am especially grateful to Mr. W.L.G. Muir, the General Manager at Marampa, and to Dr. A.A. MacKelvie, Dr. J. Hogan and Dr. J. Cooper for their kindness and assistance. Mr. Tony Opoku, of the S.L.D.C. Endemic Diseases Control Unit, was seconded to me on both occasions and his cheerful enthusiasm and skill were invaluable under difficult field conditions. I had the most friendly co-operation from the Directors of Medical Services, Dr. H.M.S. Boardman and his staff, and from all members of the Sierra Leone Government, Medical and Administrative, encountered during the course of the fieldwork.

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During the planning stage I was able to have stimulating and valuable discussions with Professor G. Macdonald and other members of the staff of the London School of Hygiene and Tropical Medicine.

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EDINBURGH.

A. Raymond Mills.

"Everywhere is love and love-making, weddings and babies from generation to generation keeping the Family of Man alive and continuing. Everywhere the sun, moon and stars, the climates and weathers, have meanings for people. Though meanings vary, we are alike in all countries and tribes in trying to read what sky, land and sea say to us. Alike and ever alike we are on all continents in the need of love, food, clothing, work, speech, worship, sleep, games, dancing, fun. From tropics to arctics humanity lives with these needs so alike, so inexorably alike".

From the Prologue by Carl Sandburg

to "The Family of Man" (1955)

Museum of Modern Art, New York.

## 1. Introduction

At the Commonwealth Finance Ministers Conference at Montreal in 1958, Dr. Desai, the Indian Finance Minister, stated that "the development of the under developed countries is the most important international problem of our time ..... neither the world, nor the Commonwealth, can continue to march forward if some countries and their peoples have nothing but poverty and stagnation to look forward to".

Industrialisation is an important factor in this development and in raising the economic standards. The products of industrialisation together with a monetary economy have now been accepted throughout most parts of the tropical world.

Even if the major role of some countries is that of primary production, some sort of industrial plant is needed and in all areas the products of industry are highly prized.

This change from a rural economy to some degree of industrialisation has come to stay. The Pacific islander is not prepared to go back to making a shell knife taking a month to manufacture when he can buy a steel one in exchange for copra, and "Africans themselves are asking for technical change and economic development". (Busia, 1954).

Industrialisation and its benefits are thus welcomed by developing countries. People are enabled to buy consumer goods, and in general, they can lead a fuller life



less dulled by drudgery. It is noteworthy that the poets who romanticise the tilling of the soil have rarely done it themselves and working with machines allows the workman more time off, more energy left over at the end of the day and more money to spend, in fact, a more varied life.

The Western world invented and developed the machine and applied it to manufacture, revolutionising production and starting off a chain reaction in the economic and social fields. This process of industrialisation took about a century, and was accompanied by a shift of population from the country to the towns, by much squalor, disease and misery.

In developing countries the process that has taken the Western World two hundred years to accomplish may now take only twenty years. The suffering, unhappiness and wastage of life that occurred in Britain due to industrialisation must be prevented from occurring in the underdeveloped countries.

It was inevitable that one's outlook on urbanisation and industrialisation should be coloured by the effects of the industrial revolution in Britain, and that parallels would naturally be sought in Sierra Leone.

In Britain at the beginning of the nineteenth century the great influx to the towns began. The immigrants were landless and lost all connection with it or even the right to cultivate a small plot for themselves. The housing was

bad and overcrowded and sanitation absent. Firewood, game and other perquisites were not available and men, women and children worked long hours before this exploitation was stopped by the coming into force of the Factory Acts. All these and many other features of industrialisation created conditions in which disease spread easily, malnutrition was rife, mortality rates were high and environmental hygiene was of the most primitive. As late as 1934-38 the Infant Mortality rate for the large burghs in Scotland was 86/1,000 compared with 65 in the landward areas, although Edinburgh had a rate of 61/1,000.

The total effect and wastage of life goaded the Government into action and at mid-century a series of reforms were carried out in the public health field. The work of clearing away the ill effects of the early Industrial Revolution will be completed when the slums of our great cities, such as Glasgow, have been cleared.

It therefore becomes an urgent matter to prevent the occurrence in Africa and other parts of the tropical world of what happened in Britain. Towns are growing at an enormous rate and the foundations of generations of squalor and disease must not be laid down in our time when the present and future generations in Africa can build on our experience.

The impression of urban life in African towns and cities is frequently of overcrowding, squalor, poverty and disease,

with beggars and deformed persons often being encountered and it is imagined that life in the villages must be better. In the villages, naked boys are seen to make cartwheels in the dust and there lingers in the European mind the myth of the "Noble Savage", propagated by Bougainville and Rousseau.

In the town much disease is in evidence, but in the village the health of the people is not known until the inhabitants of every hut have been seen. With industrialisation and concourse of labour, urbanisation follows. The towns created by the proximity of a job of work are growing in many parts of the world.

The industries may be very varied and have different requirements for the labour force. In rubber plantations the tapping of the trees cannot be done mechanically and large labour forces are required. In mining for iron, gold, tin, manganese, diamonds, etc., the processes are more mechanised and fewer workers are needed. Construction companies have variable needs at different times. Many companies provide housing for the workers in the industry but in addition to company compounds, what was once a nearby village becomes a town. Workers live there, families follow, traders and craftsmen fulfill the needs of the growing town, and in a comparatively short time a new town has been created. With the development of opencast iron

ore mining in the Marampa area of Port Loko District in the Northern Province of Sierra Leone, the small neighbouring village of Lunsar rapidly became a busy and thriving town.

The whole area was chosen for study because it seemed to contain all the elements of urbanisation in an African community without some of the possible complications such as industrial diseases. In this area it would be possible to study the processes and impact of urbanisation on tribal Africans in a comprehensive way.

As in all epidemiological studies it is important to define terms. Definitions have been taken from the Oxford Dictionary (1901).

"Industry" In the prevalent use.

- (1). Systematic work or labour; habitual employment in some useful work, now especially in the productive arts or manufacture.
- (2) A particular form or branch of productive labour.

"Industrialisation"

The process of affecting with, or devoting to, industrialism. The condition of being occupied or organised industrially.

"Rural"

Of pertaining to, or characteristic of, the country; of country life as opposed to the town.

"Town" Now commonly designating an assemblage of buildings, public and private, larger than a village, and

having more complete and independent local government.

"Urban"

- (1). Pertaining to, or characteristic of, occurring in, or taking place in, a city or town.
- (2). Constituting, forming, or including a city, town, burgh, or part of such.
- (3). Residing, dwelling, or having property in a city or town.

"Urbanisation"

The process of investing with an urban character.  
The condition of being urbanised.

"Village"

Collection of dwelling houses and other buildings larger than a hamlet and smaller than a town, or having a simpler organisation and administration than the latter.

In addition to the foregoing dictionary definitions of urban and rural environments there are economic, geographic and demographic aspects which must be stated.

The United States Bureau of Census adopted the following definitions: (Bridgman 1955)

"urban"; all sectors consisting of town and built-up areas with not less than 2,500 inhabitants.

"rural"; all district or localities with less than 2,500 inhabitants, including groups of built-up areas

having a total of more than 2,500 inhabitants but not constituting an administrative unit.

A "Metropolitan district"; is an area corresponding to a city of at least 50,000 inhabitants, as well as surrounding areas provided the population density is higher than 150 inhabitants per square mile (60 per Km<sup>2</sup>).

The term "farm" covers communities deriving a livelihood from pursuits allied to farming; persons in this group mostly live in rural areas, but farms may also be located in towns.

The term "rural non-farm"; applies to persons who live in the country but are not employed in agriculture.

The Brazilian Census Department endorsed the division between urban and rural at 2,500 inhabitants for 1930-40. In 1938, the International Statistics Institute, meeting in Prague, decided to consider as rural the population of districts whose nucleus possessed a number of inhabitants below a certain limit (to be established) and whose farming population represented more than 60% of the total active population.

The European Conference on Rural Hygiene in 1931 defined "rural" as "referring to an area or district where agriculture is the chief or even the sole industry, and where all other industries are of small importance and, in the main, dependent on agriculture".

From what follows it will be seen that Lunsar is a truly urban area by definition. It is an assemblage of buildings,

public and private, having an independent local government and a population of over 2,500 inhabitants. Likewise the rural areas fulfill the terms of the foregoing definitions, with regard to both size and occupation.

In this study, urbanisation and industrialisation are considered to be synonymous, and simultaneous.

In order to study the effect of urbanisation on health it was necessary to compare the health of rural Africans with those in the town created by the nearness of the mine.

How this has been attempted will be described in the following pages.

It might be useful at this stage to explain the method of study and also to summarise the results so that the chronological account which follows will not seem too discursive.

Preliminary studies were of two kinds. Those concerned with Sierra Leone, its people, geography, climate, medical records, etc., and those concerned with urbanisation and the measurement of health. It became quite clear that the effect on health of urbanisation had not previously been measured in Africa. The literature on urbanisation in Africa is vague on health matters and is concerned almost entirely with social change concomitant with life in towns.

The situation created by the rapid urbanisation of Africa was examined in its medical aspects by the W.H.O. Regional Committee for Africa at its ninth session in Nairobi in

1959. (W.H.O. 1960), and the picture painted was almost uniformly gloomy. The Regional Committee stressed the need for preventive work and curative services to adapt themselves to the new conditions created by urbanisation. There was no statistical evidence brought forward to support the views put forward that conditions were worse in the towns than in the villages.

There was a lack of material from Sierra Leone on which accurate estimates of health status could be based but I had hopes that it might be possible to gather data in the country which might be extended or modified to give figures which could be satisfactorily manipulated. Thus I hoped to be able to avoid taking a census and I based my pilot project on an index group 0-5, with the idea that I might be able to see all the representatives of this group both in the town and in the villages for comparison, without doing censuses.

Orientation in the field, examining local data, and trying out the pilot schedule on the patients at the Health Centre in Lunsar convinced me that all material would have to be collected ab initio, that my clinical schedule would have to be re-drawn and thought out again, and that in order to get valid sampling I would have to do a census, and that I would only have time to study the town during the first period of field work.



The pilot trial also pinpointed the indicators of health which would be useful. Nutritional status, onchocerciasis, vaccination rate and other factors, seemed to be useful. Malaria, I thought, might prove to be too widespread and evenly distributed to be useful as an index. Fertility and survival data would be essential and would require efficient sampling.

The census was undertaken with some trepidation in a teeming African town but it went very well and although its prime importance in the field was to form the framework for a clinical sample, in fact, the material has proved to be most valuable. From the point of view of medical demography, the sex-age distribution, marital status, occupation, household composition and density are of great interest and show Lunsar as a balanced population. Housing is fairly good by Sierra Leone standards but there is considerable overcrowding.

The clinical sample was taken and the physical examinations recorded carefully in detail. The ultimate worth of all the observations for comparison with the villages was not known in the early stages. I had some anxiety that I would not be able to collect a valid statistical sample due to apathy, or worse, hostility, but this proved unfounded. I was also disturbed lest I be swamped with the ordinary clinical work which I was doing and which seemed unavoidable if goodwill was to be created and maintained, and if the

sampling was to be accurate. This connection will be explained later.

The extraction of the clinical sample and the assessment of the health status of the town were carried out in Edinburgh. It was found that with respect to nutrition, onchocerciasis, survival of children, and malaria, the urban occupation group in Lunsar were better off than the rural occupation group. The extraction and process of writing up the Lunsar section, crystallised the village part of the enquiry so that before setting out on the villages survey I knew that it would entail census and total clinical sample of the villages. Because I knew the area and I was well known to the people, I was able to carry out the villages survey with speed and directness. The data required for comparison was known precisely and the form of clinical examination was almost identical with that evolved in Lunsar. Any elaboration made was in order to augment the epidemiological picture of one or other of the major diseases encountered.

The village data was extracted in Edinburgh and comparison with the town of Lunsar made. Because of the discrepancies in population structure it was necessary to use direct standardisation in order to bring out the true differences. In direct standardisation, the rate for a given condition for each age group is applied to the standard population, in this case the population of the 10%

Sample Census of Lunsar; addition of the age groups gives the number of cases of the condition which might be expected in the standard population. Thus rates for Lunsar and the villages may be compared, making allowance for the differences in population structures.

In many instances it will be seen that standardisation reverses an apparent trend. By this method it can be shown that Lunsar is healthier than the villages with respect to nutritional state, malaria, onchocerciasis, and vaccination state. Further, that females in Lunsar tend to have fewer children and that their survival rates are higher than those in the villages.

Thus urbanisation appears to be favourable in this region.

This is not really surprising. Many of our impressions of urbanisation have been taken from the effect on health of rural non-immune persons going from an isolated area with few endemic diseases to work in cities in poor hygienic surroundings and falling prey to communicable diseases endemic in the urban area.

This was the picture over a century ago. In Africa the situation is reversed. The rural person is exposed to a greater degree to the major diseases which are universally endemic in the country. Furthermore he has no facilities for treatment. This process is happening in Africa in mid-twentieth century so that in the town the facilities

for medical care, environmental hygiene and higher living standards are potent. In the town he is less exposed to vectors of disease and his life is less arduous. There are few truly isolated areas in Sierra Leone. Communications and travelling encourage spread of proximity infections so that the whole country may be infected and isolated non-immune groupings are rare.

Thus, in this part of Africa, urbanisation is of benefit to the people in certain important aspects of health. That nutrition is better in the town would seem to be of prime importance. Nutrition is at the basis of much ill health in the tropical world and I think that from this standpoint alone the effect on health of urbanisation must be judged to be beneficial.

2. The Purpose of the Investigation.

The aim of the joint project as framed by Dr. K. Little, Head of the Department of Social Anthropology in the University of Edinburgh was as follows:-

"To study the effect of industrialisation upon a tribal population in Sierra Leone, West Africa. To ascertain how this Marampa mine has affected the way of life and health of the local tribal population, as revealed by comparison between the rural villages and the industrial new town of Lunsar; how far industry requires new skills and attitudes, differing from those of their traditional way of life, and what steps may be taken to educate them for industrial work and for the new society which industry is creating among them".

From this definition the terms of reference for the medical scientist were as follows:-

"To ascertain how the Marampa mine has affected the health of the local tribal population as revealed by a comparison between the rural villages and the town of Lunsar".

The terms of reference and the duration of the project, imposed limitations on the scope of the inquiry.

A long term longitudinal study was excluded by time and also by the mobility of the African population.

It was considered that the best method of approach would

be to do a health survey of the town of Lunsar, to establish levels of health by means of indices of morbidity and mortality. This would be followed by health surveys of villages in the rural areas from which the inhabitants of the town are being drawn and have been drawn in the past.

The factors and indices common to both groups could then be compared using direct standardisation, as has been explained, thus comparing levels of health in the two situations.

### 3. Preliminary Studies.

As much data as possible was gathered about Sierra Leone and particularly about the area in which the field work was to be undertaken.

Dr. K. Little had made an important study of the Mende in Sierra Leone, and Dr. J. Littlejohn had worked and reported on the Temne in the Lunsar-Marampa area in 1954.

Data on population structure of the areas to be studied, and vital and health statistics were not available in Britain. It was anticipated that to collect and study any useful data of the area would be the first task on arrival in Sierra Leone, and that this would require the co-operation and goodwill of many Government Officials, mining executives, medical and sanitary personnel, school teachers, missionaries and others.

It was also considered necessary to assume that no relevant data would be available and to make plans for its collection at source.

A series of seminars were held in Edinburgh on the project. In the section on health, the indices that might be used and their applicability to West African conditions were discussed.

From the medical point of view the preliminary work therefore consisted in studying the Government Reports on Medical Services, gathering what little data there was, and in exploring the sort of health indices that could be

used in the field, and in drawing up a tentative pilot clinical schedule for use in the clinical survey.

(See Appendix).

Lunsar, in the Marampa-Masimera Chiefdom in the Port Loko District, was chosen for the study for the following reasons:-

(a) The anthropologist, Littlejohn (1954) had already studied the social organisation of the town.

(b) The town was situated 3 miles away from the open cast iron mine of the Sierra Leone Development Company and it was known that a large proportion of the working population was employed at the mine.

(c) It was anticipated that no occupational disease would be associated with open cast iron mining. "Occupational Disease" is taken to be one listed in the first schedule to the National Insurance (Industrial Injuries) Act, 1946.

(d) Lunsar had been a village of only 7 houses before the mine started in 1929 but was estimated in 1936 to have 300 houses and in 1959 to have a population of between 5,000 and 15,000. It was thus an example of rapid growth.



(e) Lunsar was outwith the mining concession and was a town created by the tribal Africans gathering near a place where paid work was available.

### 3.1. Geography

The territory comprising the Colony and Protectorate of Sierra Leone has an area of some 27,925 square miles, (about the size of Ireland), roughly circular in shape, lying between  $6^{\circ}55''$  and  $10^{\circ}$  north latitude and  $10^{\circ}16''$  and  $13^{\circ}18''$  of west longitude. It has a sea coast 210 miles in length extending from the Republic of Guinea border to the border of the Republic of Liberia. Inland it has common frontiers with only these two territories. (See Map 1).

The Colony, i.e., the territory acquired by the Crown by treaty of cession or otherwise, consists of the Sierra Leone Peninsula (including Freetown), Sherbro Island and various other islands and small islets.

The peninsula is about 25 miles in length and from 10 to 12 miles in breadth at its widest part. It is formed of a range of igneous mountains running parallel to the sea, the summits of the highest of which rise in conical form to a height of 2,000 to 3,000 feet. The mountains, composed principally of norite, a type of coarsely crystalline, igneous rock, are thickly wooded, and are intersected by ravines and small valleys. Freetown lies about four miles up the Sierra Leone river. It possesses one of the finest

natural harbours in west Africa, and, being one of the few points on the coast of Africa where there is high land near the sea, is a place of considerable interest and beauty. The western side of the peninsula on the sea-coast, has a number of agreeable beaches and coves.

The Protectorate, an area of about 27,656 square miles, varies considerably in different localities. The coastal strip is flat and lowlying and the river estuaries, below high-tide mark, are bounded by extensive mangrove swamps. The western and southern part of the Protectorate consists of rolling wooded country broken in places by ranges of hills rising to 1,000 feet or more. The ground rises to the north and east to form an upland plateau having a general elevation of about 1,500 feet. The Sula and Kangari hills rise to nearly 3,000 feet and, to the east, near the Guinea frontier, Bintimane peak and the summits of the Tingi range rise to above 6,000 feet. Unlike many regions on the west coast of Africa, the country is well watered by a network of rivers and streams, the general direction of flow of which is from the north-east to the south-west and into the Atlantic Ocean. In the Port Loko District it would be difficult to travel a mile in any direction and not cross a stream or river (See Map 2). The principal rivers are navigable by small craft for various distances, and provide useful water-ways, especially during the rainy season.

### 3.2. Climate

The climate of Sierra Leone is of the equatorial type, with two main phases, a dry season from mid-November to mid-April and a wet season from mid-April to mid-November. At the onset and cessation of the wet season violent thunderstorms occur, sometimes accompanied by squalls (commonly but erroneously known as tornadoes) which can reach a maximum velocity of 40-45 m.p.h. A dry north-easterly wind (the "harmattan") may blow at intervals during December, January and February and at this time visibility is restricted by the fine dust which the wind usually carried with it from the Sahara. Visibility after the first few storms in the rainy season is, however, good and frequently the mountains of the Republic of Guinea may be seen from the hills above Freetown, a distance of about 80 miles.

Geographically speaking, the country can be divided into three climatic belts, running roughly parallel with the coast, north-west and south-east:

- (1). from the coast to 50 miles inland.
- (2). 50 to 120 miles inland; and
- (3). 120 miles inland to the eastern frontier.

Mean rainfall in these belts is of the order for (1) of 130 inches or more, the highest long-term mean on record being 212 inches, although a raingauge in the Freetown hills

has recorded 319 inches in a year; for (2) of 100-130 inches; and for (3) of 75-100 inches. In belt (1) 60-70 per cent of the annual rainfall is likely to occur in the period from July to September; in (2) 50-60 per cent and in (3) 45-50 per cent during the same period.

Temperatures and relative humidity show greater variation inland than in the coastal area. The mean daily average of temperature range on the coast is 10° Fahrenheit and the range of relative humidity is 12 per cent, while inland the mean daily ranges of temperature may vary from 15° to 28° Fahrenheit and of humidity from 25 per cent to 34 per cent. The temperature, relative humidity and rainfall figures for Marampa for 1956-58 are given in the Appendix.

### 3.3. The Population of Sierra Leone

No full census of the population in the Colony area of Sierra Leone had been taken since 1931, but an enumeration was carried out on 28th December, 1947: population estimates for the Protectorate, based on test counts, carried out in selected areas, were made in 1931 and in June, 1948. (See Appendix). In all cases the work was done by the administration without the aid of any specially trained staff. The results were not in any way intended to be substitute for a full census, but it was considered that they gave some guide to the present distribution of

population. In mid-1958 the population was estimated at 2,260,000.

The population of Freetown is approximately 100,000 although there are indications that this might be an underestimate. Figures are not available for the main towns in the Protectorate but it is estimated that Bo, the largest town has a population of between 20,000 and 30,000.

The results of the 1947 enumeration indicated that since 1931 there had been an annual increase in the population of the Colony of approximately 1.5 per cent. How much of this increase was due to immigration from the Protectorate and how much to natural causes cannot be definitely stated, though there was undoubtedly a large influx of labour to the Colony from the Protectorate during the war years, and it is probable that a number of the immigrants did not return to their homes. The rate of increase of the population in the Protectorate between 1931 and 1948 was about 2 per cent per annum, though it must again be emphasised that these figures should be treated with caution.

In Sierra Leone there are Africans of many tribes, thirteen of which are indigenous, each having a different language. There are no recent estimates of the numbers in these tribes, but it may be said that over 30 per cent of the total African population in the territory is of the Mende tribe, and that just under 30 per cent is of the Temne tribe. The Mende and Temne languages are widely

spoken in the south and north respectively, and for all practical purposes are sufficient for the localities concerned. The only lingua franca is a form of pidgin English, which is fairly widespread, though by no means universal.

The registration of births and deaths which has been compulsory in the Colony for some years was made compulsory in seven chiefdoms in the Protectorate in 1957, and up to December, 1957, 125 more chiefdoms voluntarily accepted registration of births and deaths. (Ordinance No. 14 of 1948. Rules Governing Registration of Births and Deaths in the Protectorate). Birth registration is free but the apparent benefits of having a birth certificate are not great enough to attract many parents to register births. No Government employment is given to a person not holding a birth certificate. A child may not be admitted to a Government School without a birth certificate unless an affidavit is sworn by the parents. There is also the danger that an inheritance might be taken by another unless a birth certificate can be produced. No passport can be issued without production of a birth certificate. There is an Ordinance making penalties for failure to register but this is not enforced.

Death certificates from the Native Administration Court are important because in principle, no ground would be provided to bury the dead without a certificate.

In practice this does not always apply. From the extract of the Burial Record Book of the Marampa-Masimera Chiefdom (See Table 1 and Appendix) it will be noted that the numbers of persons buried in the burial grounds at Lunsar are considerably in excess of the number of registered deaths for the same area.

The registrations recorded in the Colony are fairly accurate in Freetown and some villages; those recorded in the Protectorate are unreliable. The following figures are taken from Official Annual Reports:-

Freetown

In 1958, there were 4,533 registered births and 566 deaths under one year giving an infant mortality rate of 124.9 per 1,000, with 70.6% of deaths occurring during the first month of life. The infant mortality rates per 1,000 for 1959 and 1960 were 126.1 and 121.8 respectively; there has been a downward trend over the past few years. These figures are similar to those for England and Wales in 1838-54.

By the courtesy of Mr. S.A. Allen, Superintendent, Registrar of Births and Deaths for Freetown, I was able to extract the raw data from the registers and calculate the infant mortality rates and neo-natal mortality rates for the different tribal groups in Freetown for the years 1958-1960.

FREETOWN 1958 - 1960

Tribe	Mean I.M.R./1,000	Mean Neo-natal M.R./1,000
Temne	152.7	88.1
Mende	126.0	69.9
Limba	144.3	77.5
All Inhabitants	124.7	65.6

The Temne tribe, which predominates in the Northern Province of Sierra Leone, is seen to have higher infant mortality rates and neo-natal mortality rates than any other tribal group in Freetown.

Temne births are roughly a quarter of all births registered in Freetown.

Rural Areas of the Colony: 1956

In the rural areas of the Colony the recorded registrations of births and infant deaths were:

	<u>Male</u>	<u>Female</u>	<u>Total</u>
Live Births	786	846	1,632
Deaths under 12 months	138	138	276

Infant Mortality-rate 170 per 1,000



In the Sherbro Judicial District, the recorded registrations of births and infant deaths were:

	<u>Male</u>	<u>Female</u>	<u>Total</u>
Live Births	53	54	107
Deaths under 12 months	10	12	22

Infant Mortality-rate 205.6 per 1,000.

From the foregoing figures for the Colony, it will be seen that the urban areas have lower recorded Infant Mortality-rates than the rural area.

#### 3.4. Public Health in Sierra Leone.

##### General Health

Without a full and up-to-date census it is not possible to give accurate vital statistics of birth and death rates. Available statistics of births and deaths have been given. Only a very small proportion of deaths are medically certified by qualified medical practitioners and therefore detailed statistics of mortality from the principal diseases cannot be given, but records of diseases and deaths in government hospitals indicate the more important medically observed causes of disease and mortality.

The chief diseases and causes of death in hospitals returns are the infective and parasitic diseases. Skin diseases, gastro-intestinal infections and infestation, respiratory infections and gonorrhoea are very common. Important endemic diseases are malaria, yaws, leprosy,

trypanosomiasis, schistosomiasis, filariasis, smallpox and tuberculosis. Nutritional deficiencies and anaemias are also important causes of sickness.

#### Hospital and Health Centre Services

The government medical service is responsible for the bulk of the country's hospitals. There are base hospitals at Freetown and Bo, with rural hospitals, in the principal town of each administrative district, with one additional hospital at Lungi airport. Ancillary to the hospital services are a number of health centres, as at Lunsar, containing a dispensary, a small maternity and child welfare unit, and a sanitary office and store, with a staff of a dispenser, a midwife and a health inspector. Twenty-two new health centres were planned under Colonial Development and Welfare Schemes and all of these were completed by the end of 1956. In addition to qualified midwives, village girls are trained at suitable centres as Village Maternity Assistants. They return to their villages, after training in the conduct of normal confinements, to practice domiciliary midwifery in association with the qualified midwives at health centres and hospitals.

The government also gives grants-in-aid to approved missionary hospitals and the Missions provide an important part of the hospital services. Two mining companies also have hospitals which provide excellent service for their employees, and families.

### Public Health Services

The Public Health Department of the Government Medical Service is responsible for all port and airport sanitation, the control of infectious and epidemic diseases, for malaria control schemes and for sanitation in Freetown. Elsewhere environmental sanitation is the responsibility of native authorities, special health authorities, and the town and district councils of Bo, Sherbro, and the rural areas of the Colony. All local authority sanitation is supervised by the Health Department's medical officers and health superintendents. Certain endemic diseases such as yaws, trypanosomiasis and leprosy are controlled by a field medical unit of the Government Medical Service, the Endemic Diseases Control Unit. This has been supported by W.H.O./U.N.I.C.E.F., who have also supplied equipment for Health Centres including midwifery kits and skimmed milk.

#### 3.5. The Measurement of Health

The World Health Organisation Expert Committee on the International Definition and Measurement of Standards and Levels of Living (1954) grouped the factors concerned under the following headings:-

- (1). Health - including demographic conditions.
- (2). Food and nutrition.
- (3). Education, including literacy and skills.
- (4). Conditions of work.

- (5). Employment situation.
- (6). Aggregate consumptions and savings.
- (7). Transportation.
- (8). Housing, including household facilities.
- (9). Clothing.
- (10). Recreation and entertainment.
- (11). Social security.
- (12). Human freedoms.

In studying the effects on health of urbanisation many of these factors may have to be taken into consideration, but the main items would appear to be subdivisions of the section on health.

Health has been defined by the World Health Organisation as "complete physical, mental and social well being". By this definition almost anything is involved in health, and to cover all fields related to health in this sense would be very complex and would take up more time and resources than were available for the project. Health is a relative state which varies through time and place and we must apply methods in assessment which will be relevant and obtainable in the West African context. Also any factor which shortens life or disables physically, mentally or socially is an influence involved in health.

#### Measurement of Levels of Health

This was the subject of a study group of the World

Health Organisation in 1957.

Health Indicators fall into three categories:-

- (1). Indices of Vitality and Health. This section refers to the level of individual or collective health in an area and consists of vital statistics and nutrition status under the headings of Demography, Mortality and Morbidity.
- (2). Indices of External Environment. These relate to the physical conditions of the area concerned, Meteorology, Housing, Sanitation and Consumption of foodstuffs. Also in this section are Indices of Social Environment comprising occupation, communications and electrification and education.
- (3). Indices of Public Health Activity. These give an assessment of health services and activities for the improvement of health, such as the availability and use of hospitals, physicians and other health personnel. They also include the provision of preventive as well as therapeutic services. Indices are under the headings of Personnel and Equipment, Medico-Social Activity and Social Welfare such as health insurance, relief of the aged, etc. A list of Health Indicators is given in the Appendix.

There are more than fifty indices which may be used and it will be realised that even under the conditions of a highly organised industrial state it would be very difficult and complicated to gather indices for all possible factors in the three categories. Indeed, the World Health

Organisation Study Group could do no more than indicate the sort of data that would be desirable.

The term 'Health Index' implies a reasoned selection from the unwieldy mass of available statistics of such elements as are most characteristic and descriptive of a given situation.

In the developing countries where statistics may be few and inaccurate, the selection of the indices which are most valid is very important, and even more so when indices are to be gathered by survey techniques. In surveys, only certain features of the total health situation may be covered, and it is therefore important to ensure that the most significant features are covered and measured.

In connection with the present survey it is interesting to note that one of the suggested health indicators is that of urbanisation. Bridgman (1955) considers that the urbanisation rate, namely, the ratio of population residing in towns of more than 100,000 inhabitants to the total population of the country should be adopted as one of the general indicators of health. He points out that in countries such as Uruguay, Australia, Canada and Siberia, which are predominantly agricultural, towns have been created which sometimes absorb about one third of the total inhabitants of the country, and that the enormous agricultural production of the United States, for example,

is obtained by a rural population of 8 per cent of the population. Modern hygiene has today succeeded in making the towns more healthy than the country, the infant mortality rate in Paris being the lowest in France.

Bridgman considers that this reversal of the situation of a century ago is due to a series of concerted efforts, to the health techniques which have been adopted in towns, to easy access to health centres, development of social security systems and progressive raising of wages and economic levels.

Bridgman correlated the urbanisation rate with infant mortality rate, the general mortality rate, and the birth rate for various countries and showed that the infant and general mortality rates for most of the various countries considered are in inverse ratio to the urbanisation rate. This is not true for Scotland, where in 1960 the infant mortality rate in the large burghs, 28/1,000, was higher than that for the landward areas, 25/1,000. This difference was even more marked in the past.

The correlation between urbanisation and mortality rate is also interesting in that it shows that the attraction of rural population to towns appears to put a brake on demographic increases in certain countries - increases which threaten to lead to over-population and famine.

Industrialisation of agriculture, by liberating peasants, and the creation of urban-centres to meet the needs of industry appear to be developments which improve health and reduce the birth rate, on condition, of course, that the towns provide a suitable atmosphere for the spiritual and physical development of the people.

No attempt has been made to devise a single Health Index by which the general state of public health of a community could be rated.

Stouman and Falk (1936) were of the opinion that such a unit rating would have only slight practical interest and might serve as much to obscure as to measure individuality of local problems. The present system of health indices is not meant to appraise these but to indicate, describe and measure them. Moreover, the definitions and enumeration of the states of health, disease and death, and even of civil status are not easy even in a highly organised society. In developing countries there are even more complications. These will now be considered.

#### Death.

Death is a clearly defined event, occurring at a certain place at a definite point in time which can happen only once. Death is a true negative indicator of health since life itself and the desire for life are attributes of health.



Death occurs at a certain time to a person of a defined age, in a certain place and is caused by one or more pathological conditions. The cause of death can be based on clinical findings which is confirmed, or not, by post mortem examination.

In our society the recording of death is reasonably accurate after a considerable period of experience with statistical recording and of education of the public and the medical profession in the importance of precision and promptness.

In developing countries the situation, with a few exceptions, is quite different.

Facilities for registration are frequently absent. Relatives of dead persons do not record, even if they are literate, which is rare, the date and place of death. The age of the person who died is frequently not known, and the cause of death is unknown because the person was not attended by a medical man, a nurse or dispenser. Death in the tropics may be due to multiple causes, a further source of difficulties and errors even for the medical man.

Even when facilities for registration are available, recording is frequently not done at all, or if done is much delayed perhaps due to distance of the village from the registration centre. When recording is done in this way the facts are vague and altered by the memory.

In any survey carried out in order to ascertain death statistics in a given area the same difficulties of vagueness as to time and place of death, age at death and cause of death will be encountered.

### Birth.

Birth is also a clearly defined event occurring at a certain place at a certain time. The mother is of defined age and the baby is alive or dead according to the definition of stillborn. The baby may be legitimate or illegitimate.

These facts are recorded with accuracy in Western countries but again in developing countries the situation is different. Registration facilities may be absent and even if a birth is recorded, usually at a time long after the event, the date is inaccurate, the mother's age is not known and 'illegitimate' may not be a meaningful term in the particular society. The distinction between a live born child dying within a few hours or days and a stillborn is not made. Usually the confinement is not attended by a skilled person.

In survey conditions, the recollection of obstetric histories by women is open to all these inaccuracies.

### Morbidity.

The definition of sickness is confused for many reasons. Its development and recession may be gradual, its severity may vary and its manifestations may be related to subjective reactions.

The disease may occur in repeated episodes.

Even if the disease is of an acute nature it may be difficult to define the time of onset and the time at which the patient is considered to be free of the disease. When the disease is of long duration, precision as to these times becomes even more difficult.

Assuming that the problem of defining sickness can be overcome, morbidity statistics should provide for measurement of duration of sickness and must distinguish between the frequency of sickness incidents and the number of persons affected by them.

In selecting diseases to be used as indices the above factors should be considered. Moreover in a survey of this nature it would seem to be more logical to assess endemic rather than epidemic disease, because of the greater variability of the latter, and chronic infections rather than acute, for similar reasons.

Disease may be diagnosed by observation by a medical man, a nurse, a dispenser or a lay person and the accuracy of the diagnosis will vary.

Disease may be experienced subjectively and the degree of confidence which can be attached to the diagnosis will vary according to the patient, the type of disease and subjective factors which may influence the reporting.

The professional qualifications, skill and experience of the reporter must also be taken into consideration.

In Western society the material causation of disease is now generally accepted as being due to organisms, bacteria, viruses and other parasites.

That environmental factors, toxins, organisms, etc., can cause mental disturbance is still not completely accepted so that the attitude to mental health is tinged with subjective feelings of rejection and guilt and hence the recording of mental disease either subjectively or objectively is very much less accurate than that of other types of disease.

In developing countries belief in the supernatural and witchcraft is widespread, and all disease is considered to be due to these forces. Hence the subjective admission by a person that he has a disease or the objective diagnosis by a physician has more significance. In these circumstances, the person with a disease is being attacked by supernatural forces which may be initiated by an enemy and hence the disease must be combatted with witchcraft. This does not exclude the possibility of treatment by Western medicine being used as well.

From the foregoing it can be seen that the measurement of health is difficult from the point of view of its definition and measurement of its attributes.

In a more restricted sense death, birth or disease are also difficult to record and in the conditions of a developing country the difficulties and inaccuracies are increased.

Any kind of measurement involves definitions, and in a survey in which comparisons are to be made it would be ideal to have each case of a pathological condition fulfilling certain easily defineable criteria. This has not been accepted in medicine in the past because so many variables have been involved. For example, at what haemoglobin levels and what erythrocyte counts are certain anaemias considered to be established in a patient?

Medical diagnosis is frequently made from deductions from a case history which describes symptoms, or direct observations on the patient either by eliciting physical signs or making clinical pathological examinations, etc. In the past measurement of these factors has not usually been made but it becomes important in survey work.

In the section on the clinical sample it will be noted that criteria for the conditions involved have been laid down and the same factors and assessments have been used throughout the survey, both in town and villages.

In most diseases, incidence may be measured in more than one way, e.g., onchocerciasis can be measured by skin snip or nodules, malaria by parasitaemia or spleen-rate.

For the purposes of comparison only one rate need be taken, when it has been shown that the rate used is a valid index of the disease.

It was realised that the decision as to which indicators should be used would have to be made in the field. Health indicators and all available literature were studied and plans for a sample census and a pilot clinical schedule were drawn up.

PART I.

REPORT OF THE DELEGATE

TO THE BOARD OF HEALTH

It is a pleasure to report that during my visit to the Territory and especially in the course of my travels and arrangements with the people and will be advised. This is not only courteous, but travel, accommodation, and other facilities may only be available through such means.

On arrival in Princeton, Medical Registration was made and the Board of Health, the Deputy Registrar, the Registrar, and the Minister of Health were visited. This is not an arbitrary result of all individuals but a very necessary means of informing various departments of Government of our presence in the country. On my first visit I made many friends and

**PART I.**

was with pleasure that I received these visits.

I spent a considerable time with the Chief Medical Officer, Dr. H. E. S. Anderson and explained my project to him and to Dr. S. E. Boyd Johnson, the Principal Medical Officer of Health.

I also made contact with the officials of the Sierra Leone Development Company in whose area I would be working on all occasions. I got the fullest co-operation from Mr. H. E. MacCombie, the Resident Director for Sierra Leone.

I also had friendly relations with the staff of Fourah Bay College. Without exception everyone was most helpful and cooperative.

#### 4. Lunsar Survey. Field Work

##### 4.1. Preliminary Arrangements

It is very important when going to work in any territory and especially in one overseas to make contacts and arrangements with the people who will be involved. This is not only courteous, but travel, accommodation, and other facilities may only be available through such channels.

On arrival in Freetown, Medical Registration was made and the books of the Governor, the Deputy Governor, the Premier, and the Minister of Health were signed. This is not an archaic remnant of old colonialism but a very necessary means of informing various departments of Government of one's presence in the country. On my first visit I made many friends and acquaintances and on my return it was with pleasure that I renewed these links.

I spent a considerable time with the Chief Medical Officer, Dr. H.M.S. Boardman and explained my project to him and to Dr. D.E. Boye Johnson, the Principal Medical Officer of Health.

I also made contact with the officials of the Sierra Leone Development Company in whose area I would be working on all occasions. I got the fullest co-operation from Mr. C.P. MacConnachie, the Resident Director for Sierra Leone.

I also had friendly relations with the staff of Fourah Bay College. Without exception everyone was most helpful and co-operative.



On arrival, in Lunsar, I paid my respects to the Paramount Chief, Bai Koblo Pathbana, M.B.E., Minister without Portfolio, member of the House of Representatives for Port Loko District Council and his brother, The Speaker, Pa Seebanah. Bai Koblo is Paramount Chief of the amalgamated Marampa-Masimera Chiefdom.

I also met the Roman Catholic Missionary, Father Milano, the Dispensers, Messrs. Kargbo and Kowa, the officials of the Native Administration, the School Teachers and the Sanitary Inspector. I made a journey to Port Loko, the District Headquarters, to greet the District Commissioner.

I also met notables of the local community including the Lebanese traders. At the mines I met the managers, Mr. W.L.G. Muir, and Mr. A. Stapleton and the whole of the Medical Preventive and Nursing Services from which I got full co-operation.

Through the kindness of the doctors, Dr. J. Hogan and Dr. J. Cooper, the nursing sisters, nurses and technicians I was able to make full use of the excellent facilities of the hospital, and its laboratory. Having such excellent co-operation and facilities at base, was a great advantage, and enabled more work to be done than had been anticipated.

It should be stressed how important these contacts are at all levels. It takes up a considerable amount of

time at the beginning of the project but it is an essential ingredient if it is to run smoothly. The project must be explained and it should be made clear that it will not be to anyone's detriment, rather to the benefit of the region. In the villages it was necessary to meet the Chief and discuss the project with him, also the Clerk to the Native Administration of the area. The Chief had always been informed previously of my visit because I had always discussed the work with the Paramount Chief, so that any movements I made in his Chiefdom would always be with his prior knowledge and approval.

It should be pointed out that the boundaries of Chiefdoms are irregular and ill-defined. Chiefdoms are made up of villages, some of which are combined to form Sections, and these groups give their personal loyalty to a Chief by custom and tradition.

The geographical area of a Chiefdom is therefore highly irregular so that in travelling one frequently crosses from one to another and back again without being aware of it.

It is important, however, to confine one's activities to Chiefdoms with which good relations have been made.

#### 4.2. Orientation

On arrival in Lunsar, Lunsar Health Centre records, the Birth and Death Registers of the Native Administration of the Marampa-Masimera Chiefdom (See Appendix) and the

Burial Record Book of the Sanitary Inspector were all extracted by the author. Registrations are on a voluntary basis. An examination of these records showed the following:-

1. Health Centre records, for attenders  
(See Appendix) showed that respiratory diseases, ulcers, malaria and digestive disorders were the commonest complaints seen and treated in that order of frequency.
2. The Birth and Death Registers were grossly under registered. More male than female births were registered, perhaps because it is considered more important for a male to have a Birth Certificate.

Infant mortality rates calculated from these Registers are as follows:-

1956	.....	279/1,000	live births
1957	.....	86/1,000	live births
1958	.....	138/1,000	live births

This variability is very great.

Causes of mortality were certified by a medical man at

the following rates:-

1956 ..... 1 in 56 deaths  
 1957 ..... 1 in 23.5 deaths  
 1958 ..... 1 in 7.5 deaths

3. The Burial Record Book was kept by the Sanitary Inspector and gave the following data compared with Registered deaths. It indicates the numbers buried in the Moslem and Christian cemeteries (See Appendix).

Table 1

Number Buried Compare with Registered Deaths; Lunsar.

1957		1958	
<u>Burial Record Book</u>	<u>Registered Deaths</u>	<u>Burial Record Book</u>	<u>Registered Deaths</u>
Number Buried		Number Buried	
Males	49	46	46
Females	47	49	47
Total	96	95	83

In 1957 twice as many persons were buried as were registered as having died in that year.

Few ages are given in the Burial Record Book but there are records of children as young as one week. Stillbirths

have not been recorded in any way. Bodies are probably buried near houses or gardens. There appears to be no difference between Christian and Muslim practice regarding stillbirth. In both cases the child has not lived and therefore is not baptised or given any ceremony and thus no burial service. The same holds true for the Muslim equivalents.

These extracts emphasised the unreliability of the local records as a basis for investigation. In addition, no data were available on the population structure. This comment is not a criticism of these records which should continue to be kept and a higher standard continually strived for. The keeping of such records helps to educate the Africans to become more used to administrative functions and helps to diminish the natural fear of enumeration present in all peoples.

The records themselves are of considerable sociological, demographic and medical interest.

#### 4.3. Pilot Clinical Schedule. (See Appendix)

It was realised that civil and demographic data would have to be collected and a section of the clinical schedule was arranged to indicate numbers of children born, ages at death and other factors in order to calculate the necessary rates.

Morbidity indices of diseases prevalent in the area would have to be collected. This presented a problem

in so far as the area had not previously been surveyed and knowledge was scanty. Malnutrition, malaria, intestinal parasites and anaemia were the diseases assumed to be present. Onchocerciasis was not considered to be important in the area according to Government reports, and the Schedule was constructed in Edinburgh accordingly.

Intestinal parasite loads were considered as a possible health indicator. But since it was expected that almost all the population of the area, urban and rural alike, would have intestinal parasites, differences would have to be measured in terms of parasite density and this was considered to be too lengthy a procedure to be practicable.

The pilot clinical schedule was drawn up with a view to having a trial run on arrival in Lunsar, and making any necessary modifications in the light of practical experience.

Indices of Environment would also be collected in Lunsar and Public Health activity would be described.

Because the population of the town and the local areas was unknown it was considered that an index group might have to be selected and it was proposed to study the age 0-5 group, if this should be necessary.

The Schedule was therefore divided into three sections, the first being civil data; the second the clinical examination; and the third family data. The schedule

was tried out at Lunsar Health Centre with twelve clinic attenders.

Some results from the trial run were as follows:-

1. Ages: 1,3,5,6,7,10 months. 2,2 $\frac{1}{2}$ ,3,3 $\frac{1}{2}$ ,5 years checked against dentition and a calendar of local events.
2. 8 from Lunsar, 4 from villages.
3. Nutritional deficiency absent in all cases.  
On the other hand malnutrition had been seen in the street and in my medical practice.

The defects of the schedule in practice were as follows:-

1. General arrangement of the form was cumbersome and took 35-40 minutes to complete.
2. Too much detail was included on the nutrition section. This meant that time was wasted going over many negatives.
3. The dental section was too complicated. Not being a dentist with skill in handling patients, and the patients never having had an oral examination before, both these added up to too much struggle for too small a result.
4. On family data, much of this could not be definite, e.g., who is in charge of the child?  
Where does it work?



5. It was found useful to add items such as religion, umbilical hernia, onchocerciasis data and other factors, and omit items such as tuberculin testing.
6. In short, the pilot clinical schedule had to be re-written and simplified in the light of the above factors, and also with the experience being gained in the general practice of medicine in the town, showing that respiratory disorders, malaria, and intestinal disorders were the commonest conditions seen. Also the frequency of diseases seen at the Lunsar Health Centre was noted.

It was also realised that the Health Centre was evidently not seeing a cross-section of the population of the town as women and children predominated and, therefore, the clinic attenders could not be used for sampling and some other means would have to be devised.

During the trial it was also found that my interpreter was not capable of taking dictation of clinical notes so that the physical examination, the history taking and all writing had to be done by the author.

This obviously takes up time and means more work but it was found necessary to continue this practice throughout the whole of the research programme.



From this preliminary trial the attitudes of the Africans to certain concepts became apparent. Littlejohn has made a study of Temne attitudes and philosophy.

Time.

During the trial it became apparent that the African had a different concept of time scale, and that some reliance could only be placed when the person was confident and the fact was corroborated. Some mothers would give the ages of their children to within a month or even days without hesitation. Others had simply no idea.

Age, thus became an estimate, more accurate in the younger age-groups and less sure in the older age-groups. Time is important when one wishes to know how long a person has lived in a certain place. Africans would give answers differing by as much as 20 years on two different occasions in response to the same question "How long have you lived in Lunsar?". The figure taken was the result of prolonged questioning about the person's movements.

The Temne have no names for days, no division of days into weeks. There are names for lunar months but no intercalation with the solar year. A questionnaire carried out in my clinic by Dr. Littlejohn revealed disagreement as to the name of the current month. The name of the month differs at different places because e.g.

of the stage of the harvest to which it is related.

There is no year but the alternation of wet and dry season and the farming activities associated with them provide the most stable time referents for the near past. Facts, are approached differently by the African and the European. The African believes in magical causes of disease and will state that a skin infection was caused by "the breeze from a witch" an "Anlunshu", or that a club foot was caused by the bite of a fish which was "in fact" a witch. The distinction between reality and non-reality does not exist and all facts have to be interpreted bearing this in mind.

#### Names.

These are often difficult to elicit. Women use the surnames of their fathers, not their husbands. Often a person will change both first and surnames when questioned on different occasions. The explanation sometimes given is that they are "afraid". Some Africans fear that the doctor will not see them a second time and will become "cross" if they come again. The change in name is therefore intended to deceive him but it is obviously most difficult for the doctor who is keeping a card index system. The African may not realise that it may be desirable to see a patient many times. According to Littlejohn, every Buna or clan amongst the Temne has a series of names and a man can change his name from one to the other and give his son another of the clan names without causing

comment. This habit is irritating to Europeans who are not aware that name-changing is permissible among the Temne.

An interesting attitude was observed in Melanesia when doing medical surveys. The Melanesian will not speak his own name when questioned but will allow bystanders to speak for him. When his name is spoken he smiles shyly.

The results of these preliminary observations were as follows:-

- (a). All local data were unreliable or deficient from the survey point of view.
- (b). The clinical schedule would have to be reconstructed in the light of the trial.
- (c). Onchocerciasis appeared to be more prevalent than had been thought and might be used as an index.
- (d). Sampling techniques would have to be used on the total population of Lunsar, and a census would have to be made.
- (e). The magnitude of the task for a single-handed medical man meant that the duration of the first part of the project, eight months, would enable only Lunsar to be studied and comparisons would have to be made between different sections of its population. The

comparison of Lunsar with villages would have to be made at a later date.

The first phase of the project thus resolved itself into the following components:-

- (1). A sample census of Lunsar to establish baseline data on population, housing and other factors.
- (2). The assessment of a clinical sample, taken from the census sample, for estimation of levels of health.
- (3). A comparison between the health levels of two occupational groups within Lunsar.

The first group consisting of workers who are engaged in industry, and their families, who thus depend on a wage packet for the largest part of their livelihood. The second group consisting of those engaged in rural occupations such as rice farming in the swamps around Lunsar. Both groups are urban dwellers.

The results of this comparison might give a lead as to what might be expected in a comparison of Lunsar as a whole with villages in the rural areas.

- (4). The collection of data about Lunsar and its surrounding area which might elucidate the ecology of the region.

## 5. Lunsar Survey.

### 5.1. History of the Area

Africans have been making knives and machetes from the iron from Masaboin for a very long time. Valentin Fernandes (1506-1510) a Portuguese explorer states "en Serra Lyoa ..... dans ce pays, il y a beaucoup de fer, et de bonn qualite. S'ils savaient faire des engins, il y aurait beaucoup plus de fer qu'en Biscaye".

When the stone was heated in the process of smelting the metal came out and the wastestone was thrown away, Lunsar is a descriptive name in the Temne language.

The first Europeans to visit West Africa brought knives and metal tools and because of their superior quality the Africans stopped working the iron deposits. By 1460, Portuguese explorers had reached Sierra Leone.

The haematite ore deposits in the Marampa Chiefdom were discovered by Dr. N.R. Junner of the Government Geological Department in 1926. At this time Lunsar consisted of 7 houses near the Barkay River in which is now called Old Lunsar, at an intersection of routes (See Map 2). The Headman was Pa Bai Lunsar and Marampa was a sacred place.

Exploration in 1927-28 by the African and Eastern Trading Corporation Ltd., confirmed that the deposits were promising and in 1928 the Corporation obtained a

Concession from the Tribal Authority of Marampa to permit the working of iron ore in Masaboin and Gbafal. Mr. James Campbell, a member of Northern Mercantile and Investment Corporation Ltd., continued detailed exploration from 1928 to 1930 and confirmed that the deposits were of such quality and quantity to justify development. The Sierra Leone Development Company was formed to work the Concession.

From 1927 Lunsar grew rapidly. People came from all over the Protectorate and from Freetown and settled in the area which is outside the mining concession.

Domestic slaves were freed in 1927 in the Protectorate of Sierra Leone, (Ordinance No. 24, of 1927), and many of these came to Lunsar to seek work. These are not necessarily the best physical material and therefore it was not the "most healthy and adventurous" who selected themselves to help to form a new town at that period and take up the occupation of mining.

During the construction phase of the Sierra Leone Development Company's programme, 10,000 men were employed on the installations, mill, railway, port, etc.

Construction was completed in 1933 and retrenchment was made in all sectors, the labour force being reduced to approximately its present size.

By 1942, there were 300 houses in Lunsar and the

Chiefdom was transferred from Marampa to Lunsar in 1942. In that year, Bai Koblo Pathbana was made Paramount Chief. Pa Seebanah, the Speaker, succeeded Pyamba Kabia in this capacity.

Pa Santikifullabia, a son of Pa Bai Lunsar, is head of Lunsar under the Paramount Chief and he owns all the land. However, the principal owner of the land is the Paramount Chief because he owns the Chiefdom.

Rents from land are divided into three, one third going to the Paramount Chief, one third to the Chiefdom for Administration and one third to the land owner. All land is leasehold.

If a person comes from another place and wishes to build a house on some land, he must get permission from the land-owner and he must pay Pa Santikifullabia, a sum of money. This is called "rent". There is only one payment and it must be sufficient to satisfy the land-owner. A house costs between £700 and £800 at present day prices (1960). Once the house is only partly built, the relatives come to stay. This is a tradition.

#### 5.2. Description of Lunsar.

In the Northern Province of Sierra Leone in the Port Loko District in the Marampa-Masimera Chiefdom, two hills rise from the Marampa plain. The largest is Masaboin and the other Gbafal. The hill of Masaboin was said to be the home of a spirit, Masaboin Tenke. Before the white

man came, lights used to appear on Masaboin and thus Masaboin Tenke is named after the Firefly, Ba Tenke. Gbafal, the other smaller hill is the husband of Masaboin Tenke. Gbafal is a short dress without sleeves and this devil wore a gbafal.

Lunsar (See map) is a town situated about one mile to the west of Masaboin across the Robath Barkey or Baki, a stream which forms a swamp in the rainy season running round the whole of the eastern and southern part of the town. On the northern and western part of the town is another stream, the Makankwis, which also forms a swamp. These streams join and run into the Rokel River. Lunsar is thus almost entirely surrounded by rice swamps except for the area in the north-east where the contours are 330 feet. The 300 foot contour runs through the Barkey swamp so that the greatest elevation of the town is only 30 feet above this level. Almost the whole of the town lies within a circle of 800 yards radius with its centre at the junction of King Edward Street, and Bai Supa Road, and has an area of approximately 416 acres. Lunsar is laid out roughly on a grid system with wide streets, mostly grass grown, and ample space between the houses. It has a market, two schools, two churches, two mosques, Poro bush, Lebanese and African stores and bars. There is a Police Compound at the north-east edge of the town.



As regards buildings, Lunsar is above the average for Sierra Leone towns. The houses are mostly rectangular in shape, unlike the traditional Temne round house. Houses are frequently demolished in one day, and a new construction started at the same site.

The town has two main streets, King Edward Street and Bai Rampa Road with the market at the upper end of King Edward Street. The main streets have shops, the larger and more elaborate ones belonging to the Lebanese traders. Barclays Bank D.C. & O. is at the foot of King Edward Street and the Native Administration Court House is situated half-way up it. At the top is the Post Office, in telephone communication with other centres.

There are many bars, and street traders either have small stalls at the side of the road or carry their wares on a tray on the head.

There are some trees scattered about the town which is reasonably well laid out. Secondary bush surrounds the Lunsar area.

During the Lunsar survey from April to December, 1959, I lived in an African house in Lunsar. This was an invaluable experience for which there is no substitute if one is to learn something about the African pattern of living.

#### Town Life.

Lunsar is a vital town. During the daytime the streets

are usually busy and there is continuous noise of shouting children and animals such as cocks and goats. Drumming occurs most of the time. It is heard from the mosque five times a day at the call to prayer, and at other times for amusement, religious occasions, dancing and other activities. Three-ton trucks called "mammy wagons" roar down the streets and they rev up in the early morning. Builders hammer.

Rice is pounded from before dawn onwards in wooden mortars with long wooden poles. Dyers using indigo beat the cloth with wooden mallets for long periods.

As soon as one moves about, the children call out "opoto" ("whiteman" from "Portuguese") and beg for a penny. It was found to be difficult, with a few notable exceptions, to have social relationships with Africans because they always deteriorated into sponging. The white man is considered to be inexhaustibly wealthy.

Opposite the house where I lived and held my clinic, was the home of the Imam, the Head of the Muslim Community. He had a school of Arabic prayers and the chanting of the Koranic phrases was repeated over and over again. This starts up just after dawn.

Processions go through the streets dancing and drumming. Rain on the corrugated iron roof drowns conversation and prevents sleep at night during the rains.

If Africans have some freedom from stress diseases it may be related to the catharsis of dancing and singing at festivals.

At the end of Ramadan (16th March, 1961) high officials in the Native Administration of Lunsar were to be seen performing with great abandon. Some were carried away with the dance to such an extent that they were at first unrecognisable. If persons like this move to Freetown and work in higher Government positions such activities would presumably be dropped.

It is in this white collar group in Freetown that stress effects and neuroses have been recorded to be similar to those seen in the expatriate officials (McIntyre, 1960). The changes in the social behaviour of town Africans is being studied by the social anthropologists in the team.

In an African town or village there is no privacy. One lives in continual contact with one's fellow beings. There is no place to read or study in an African household, and indeed, if a young African wants to study he has to go to a residential school otherwise he would find it impossible to get the necessary seclusion at night.

Although, as a European living in the midst of such seething humanity was found to be rather trying, it is easy to see that for an African, Lunsar would be a most desirable place in which to live. There is never a dull

moment. Dance processions, acrobats, Jolly Boys (a dance society) and even human baboons.

I was taken to see a "Human Baboon" outside the Lunsar Court House early one morning. This proved to be a large chimpanzee, chained at the wrists and ankles and still bleeding from several bullet wounds. I measured the animal which was 4 ft. 6 ins. high, 14 inches across the chest and  $14\frac{1}{2}$  inches round the biceps. It had been killed at Magbele that morning, about 20 miles away. The animal was dead but still warm. It had been killed by a member of the "Baboon Society" who stated that he knew the man "inside" the chimpanzee. This animal was believed to be able to change into human form and back to a "baboon" at will. It was said to have killed people in the Magbele region. It was certainly an old and formidable beast.

Lunsar does seem to retain much of the cultural patterns of the villages. Even though a large proportion of the inhabitants are working for a wage packet, the tribal pattern with festivals, initiations, harvests, etc., is still carried on. The town has many of the qualities of a very large village and the nearness of the farm land emphasises this. Many of Lunsar's population are, in fact, immigrants from the villages and the tribal composition of the two areas are much the same as will be shown later.

Lunsar has, of course, the admixture of foreigners associated with almost every town employing skills. On the credit side of Lunsar life must be mentioned the friendliness, cheerfulness and tolerance of the people. The team, including wives and children were accepted into the African community with friendliness. On no occasion whatever, even during a strike of mine workers, were we subjected to any unpleasant incident or action.

Lunsar is served by medical and health services from both the Government and from the Sierra Leone Development Company.

A brief description of these social services will follow.

### 5.3. Government Health Services, Lunsar.

These include Health and Sanitary services and they are administratively under the supervision of the District Medical Officer at Port Loko Hospital.

#### Lunsar Special Health Authority

This is a body created to meet the special needs of Lunsar, in Town Planning, Building Regulations and permits and other problems which may arise from time to time. The District Commissioner, and District Medical Officer from Port Loko, the Senior Medical Officer, S.L.D.C., and the Paramount Chief or his representative make up this authority. The District Engineer, Port Loko, is responsible for water supplies, roads, bridges and culverts.

Lunsar Health Centre.

The Dispenser, was trained at Comnaught Hospital, Freetown, as a nurse, for three years. In addition he had  $1\frac{1}{2}$  years training as a dispenser. The post is at Lunsar Health Centre, the Government run organisation, and the Dispenser does not go on tour. There is also an assistant dispenser at Lunsar.

The midwife, was also trained at the Connaught Hospital, where she was a student midwife. She took her midwifery Certificate at the Maternity Hospital. She is based on Lunsar Health Centre. During October 1959, there were 6 deliveries in L.H.C. and 11 in the villages.

The villages are in the care of an Assistant Nurse who visits them three days weekly. 3 or 4 of the villages around Lunsar are visited on one day. She gives advice about child care, ante-natal care and delivers babies.

At the Infant Welfare Clinic held at L.H.C. 50-60 persons were seen daily, and at the ante-natal clinic 20-30 are seen during a session.

Dried milk is given free as required, but seems to be rapidly exhausted.

There is also a Government trained dispenser working privately, who visits Lunsar on Thursday afternoons and Friday mornings. He has a shop where medicines are sold. He also makes rounds of the villages.

Government Sanitary Services, Lunsar.

These are under the direction of the Health Inspector who is Freetown trained, having spent 3 years at the Connaught Hospital. The training included some surveying. After having his efficiency confirmed he was issued with a badge and posted. His duties cover Lunsar, Foradugu about 11 miles away, and occasional visits to Pepel on the estuary of the Freetown River. He also visits all villages in the Marampa-Masimera Chiefdom in case of an outbreak of communicable disease.

Sanitary Routine in Lunsar.

1. House to house inspection for general hygiene. Keeping compounds clean, and supervision of latrines.
2. Mosquito control - spraying of pools in area. There is no house spraying with DDT performed by the Sanitary Service.
3. Inspection of building sites and supervision of plans for new buildings. The Health Inspector pegs out the dimensions of new buildings. He also sees if the regulations are carried out, e.g., enough windows per room. There are building regulations laid down by the Government.
4. Food inspection. Premises where food is sold, e.g. bakeries, market.

5. The slaughter house is also under his control and meat is inspected by him.
6. Rubbish - controlled tipping is the method used. There are three rubbish dumps.
  - (1). Kabia St. : Mende Street.
  - (2). Bai Rampa Road.
  - (3). St. Peter's Street.

People take their own rubbish to the dump and labourers arrange and burn the rubbish. Some people put rubbish on their gardens. This is permitted except for bottles and cans. The latter are used for making lamps in Lunsar, so not many cans are thrown away.

7. Cemetery.

Burial is controlled and the cemetery is kept clean. There is no transport for the sanitary service. In addition to the Health Inspector there are 1 overseer, 1 headman and 11 labourers.

#### 5.4. Lunsar Water Supply.

Raw water is drawn off the Robat Barkey where the continuation of Delco Road crosses the stream (See Map 3). There is a small dam and a pumping station. There is no purification of the water. There are numerous standpipes



adequately distributed throughout the town.

On an average 35,000 gallons of water were pumped per day, during 14 hours pumping. In the Lunsar sample 43 (74.1%) households used the town water supply from the nearby standpipe. 8 (13.8%) households had their own wells and 7 (12.1%) used the stream.

Basing consumption on the District Commissioner's population estimate of 5,000, a figure of 7 gallons daily was considered to be adequate. There were however numerous complaints about the inadequacy of the water supply and a check was made on 31st October 1959, when the amounts drawn off from full tanks were measured. These were as follows:-

12 noon - 2 p.m.	.....	14,800 gallons
2 p.m. - 4 p.m.	.....	25,600 gallons
4 p.m. - 6 p.m.	.....	12,400 gallons
		<hr/>
		56,800 gallons
		<hr/>

These amounts were considerably in excess of the pumping rate and at an estimated population of 5,000 would give a consumption of over 10 gallons per head, which is high for Lunsar.

The Divisional Engineer therefore suspected that the population was greater than the accepted estimate and I was able to confirm this from my Sample Census figures.

With a population of 10,000 and an average daily output of 35,000 gallons the water consumption per head was 3.5 for 2-4 hours daily. Women, and children surrounded the standpipes at this time and carry it in petrol cans on their heads to the houses.

Because of the uncertainty of the supplies the taps were always left open and much water was wasted.

Water Supply to Lunsar, in gallons, 1959

June .....	1,107,000
July .....	1,134,000
August .....	1,091,000
September .....	1,118,000
October .....	1,262,000

In Britain, the recommended amount of water per head is 60 gallons daily. In Sarawak, in a rural area with no water carriage sewage disposal or baths, 40 gallons per head daily is recommended.

Water requirements for Indian Troops in barrack in the plains is 8 gallons per head (Field Service Hygiene Notes, India 1940).

The Barkey stream from which the supply is drawn flows past Lunsar to the Rokel River. At each village or town above and below Lunsar the stream is used for washing so that the water is bound to be heavily contaminated. It is indeed fortunate that schistosomiasis does not appear to be present in the area.

By any standards, Lunsar has an inadequate and impure water supply, at the present time.

5.5. Sierra Leone Development Company's Health and Sanitary Services.

Marampa Mines Health Centre.

This is a modern tropical hospital, self-contained, with its own Nurse training School. It has 30 general beds, 4 maternity and 6 infectious diseases beds, and 8 cots.

There are two medical officers, four trained nursing sisters and an adequate staff.

African mine workers and their dependants are seen at this hospital whether they live in the mining compound or in Lunsar. As the African family is an extended one, it is often very difficult to distinguish an entitled from a non-entitled person.

Emergencies are seen from whatever source and the standards of medical, surgical and nursing care are high.

Of the out-patients attending the Marampa Mines Health Centre approximately 5 are domiciled in Lunsar to every one domiciled in the hamlets on the mining compound. Entitled patients domiciled in the neighbouring villages are also seen.

The hospital beds are almost always full.

I was able to extract birth weights from the obstetric records at the Hospital. 219 case records were extracted. The mean birth weight for Africans, both males

and females, was 6 lbs 8 ozs. Details of these records are given in Table 23, and the figure compared with those for other parts of Africa.

I was also able to copy the Register of Births at Marampa Mines Health Centre and this is given in the Appendix.

Table 2. Out-Patient and Hospital Admissions at Marampa Mines Health Centre and Pepel Hospital, 1960.

	New Cases		Total O.P. Attendance		Hospital Admissions.	
	MMHC	PEPEL	MMHC	PEPEL	MMHC	PEPEL
Jan	1335	1074	1899	1604	108	1
Feb	1061	1103	1629	1941	97	9
Mar	1507	1162	2477	1933	136	7
Apr	2002	930	3121	1190	124	8
May	2002	1016	3721	2251	148	10
June	1955	1367	3872	2144	153	8
July	2443	1364	5564	1740	115	12
Aug	2693	1743	5791	2539	174	10
Sept	2563	1964	6307	2037	136	7
Oct	2018	1799	3542	2669	153	4
Nov	1969	1546	4795	2515	164	4
Dec	1589	1524	2556	3057	160	5

There were 42, 274 O.P. attendances and 1,668 Hospital Admissions at the Marampa Mines Health Centre in 1960.

Table 3

Sierra Leone Development Company 1960.

African Labour Force at risk for Health Services.

	<u>PEPEL</u>	<u>MARAMPA</u>
January	670	2073
February	670	2160
March	Not given	2144
April	Not given	2274
May	Not given	2169
June	Not given	2402
July	737	2529
August	730	2679
September	Not given	2599
October	836	2363
November	769	2102
December	772	2076

It should be noted that December, January and February, the slack time for work on the farms, is also the time when the S.L.D.C. labour force is at its minimum.

Sanitary Services in the Lunsar Area provided by the Sierra

Leone Development Company.

Malaria Control.

The Batabana and Rochendata swamps are drained and controlled by Endemic Diseases Control Organisation of the mines. Larval control is carried out by oiling gangs

in the area around the Marampa concession. Residual spraying is carried out in the mining compounds and in the surrounding villages.

Beginning in September 1959, the houses of Lunsar were given a residual DDT spray by the Unit from the mines. This was performed free of charge. 591 out of 635 buildings were sprayed, i.e., 93%, but in 172 cases, one or more rooms were inaccessible due to their being locked during the day while the tenant was away.

An opinion survey was carried out by the author during preliminary work on the census. The 58 houses in the sample visited, all agreed to accept free house spraying with DDT and the Endemic Disease Control Organisation acted on this information.

The sanitary activities of this excellent organisation do much to improve hygiene in the Lunsar area.

It should be noted that this was the first time that any residual spraying had been carried out in Lunsar. Since the clinical survey of Lunsar was commenced on 26th August, 1959 and completed by 7th November, 1959, any effect resulting from the residual spraying would not modify clinical findings.

#### Roman Catholic Mission Medical Services.

During the period of my stay in Lunsar, the Roman Catholic Mission was constructing a hospital at Mabesene, two miles from Lunsar. On the occasion of my second

visit the hospital had just commenced operations with a resident Medical Officer, some nursing sisters of the Catholic Order and African attendants. This hospital will undoubtedly play a part in raising health standards in the Lunsar region.

Method of carrying out the Sample Census of Lunsar

March 1952, July 1952

It was decided to use an "Inhabited House" as a unit for the purpose of the census, an inhabited house or compound is a single dwelling or a group of dwellings with a common yard, either open or covered. The first stage of the census was the enumeration of the first stage. The second stage was the enumeration of the second stage. The third stage was the enumeration of the third stage. The fourth stage was the enumeration of the fourth stage. The fifth stage was the enumeration of the fifth stage. The sixth stage was the enumeration of the sixth stage. The seventh stage was the enumeration of the seventh stage. The eighth stage was the enumeration of the eighth stage. The ninth stage was the enumeration of the ninth stage. The tenth stage was the enumeration of the tenth stage.

The other was made by Mr. H. E. Gally, the Administrator of the Sierra Leone Development Department's Research Division, who visited Lunsar in February, 1952 in connection with a general medical survey programme.

A third map called "Preliminary Town Plan of Lunsar"

6. Lunsar Survey - Demographic Survey.

6.1. Sample Census - Method.

It was evident that before any precise information could be known about the health of Lunsar a census would have to be performed. This was a considerable undertaking as there was little basic data except for estimations of the total population which showed great variability (See Appendix). The District Commissioners estimate in 1959 was 5,000 and that of Dr. Littlejohn 10,000 - 15,000. Plans were therefore made to take a sample census of the town.

Method of carrying out a 10% Sample Census of Lunsar, Sierra Leone, July 1959.

It was decided to use an "Inhabited House" as a unit. For the purpose of the census, an inhabited house or homestead is a single dwelling or a group of dwellings with a common yard, either open or closed. The identification on a map and enumeration was the first stage.

There were two available maps of Lunsar town. One was the Sketch Plan of Lunsar made originally in 1942 by the Lands and Surveys Department.

The other was made by Mr. H.H. Goiny, the Entomologist to the Sierra Leone Development Company's Endemic Diseases control unit in February, 1959 in connection with a proposed Residual Spraying programme.

A third map called "Preliminary Town Plan of Lunsar"



has come to hand since the Census was completed, and was produced at Marampa from aerial photographs in April, 1958. None of these maps, unmodified, were accurate in identifying an "inhabited house", because all showed each building separately with varying degrees of accuracy.

This is because most African houses have a separate structure a short distance away from the main house, not necessarily smaller than the main structure, which contains the kitchen but also frequently, habitable, and inhabited rooms. These rooms may be occupied by members of the family or the household unit.

To overcome this difficulty I modified the Sketch Plan of Lunsar, 1942. This was done by walking round the town and marking the "inhabited houses" on the plan. I added the new houses and houses under construction, and I deleted those that had been removed. Almost all Lunsar lies within a circle of radius of 800 yards, so that the task was not too formidable (See map).

The town had grown considerably in extent and density since 1942. New, larger and better houses were being constructed on both old and new sites. The finished map thus showed "houses", inhabited or under construction, and does not show the total number of separate structures. There were 579 "inhabited houses" in Lunsar at the end of July 1959.

The map was completed in mid-July but modifications were made up to the day on which the Census took place. This was necessary because of the speed of demolition in Lunsar. A house, inhabited one day, may be torn down the next, and within a few days a new construction arises on the old site. In fact, in the subsequent selection for sampling, none of the houses selected was destroyed in this manner. Thus, the map which is accurate for the end of July, 1959, may not be accurate by the end of August.

The map was then divided into 6 Sectors marked A - F of approximately the same size, and each house was allocated a Sector Number.

Each Sector Number was then given a serial number up to 579 and a 10% random sample of these numbers was drawn from the Tables in "Principles of Medical Statistics" 1955, Hill, A.B., Lancet, London, 6th Edn. These numbers were equated with the Sector Numbers and the houses selected were identified and marked on the map. Thus 58 houses were selected for the census.

I worked out Forms A and B (See Appendix) for the collection of data about the inhabited house and its inhabitants. A trial run was carried out on a house on 14th July, 1959, and one hour was taken for completion of the forms. As a result of this trial only slight modifications were considered necessary.

The Census Forms were cyclostyled by the courtesy of the Sierra Leone Development Company to whom I am most grateful.

A list of definitions and instructions was made out, and Census Officers were then picked and arrangements made. The census team was as follows: Doctors Mills, Littlejohn and Gamble worked each with his own interpreter; V.S. Kanu, Schoolteacher at the Catholic School; J.D. Kaimapu, Sanitary Inspector; A.A. Kargbo, Dispenser; and A.M. Saccoh, Clerk, all worked alone. There were thus seven Census Officers all able to communicate in Temne, Creole and English. One was also a Mende speaker.

A meeting was held at which all the Officers were briefed together and as a result of discussion some definitions were amended.

#### INSTRUCTIONS AND DEFINITIONS

Census of Lunsar, Sierra Leone

31st July, 1959.

1. The object is to estimate the population of Lunsar by taking a 10% random sample.
2. It is estimated that there are 579 inhabited houses in Lunsar, and houses have been drawn by random numbers and indicated on the map of the town.
3. Each of these 58 houses will be visited on the 31st July, 1959 to ascertain exactly how many

persons spent the preceding night of 30-31st July in that house.

4. Particulars of the house will be listed on Form A, and particulars of the persons in the house will be listed on Form B.
5. A "house" is an inhabited house including any out-houses which may or may not be attached to the main building. Kitchens and latrines are usually separate and these are included in this definition. A "room" is any room which may be used for sleeping and includes the room usually called the parlour. It excludes kitchen, toilet or storeroom .
6. Names. A woman may retain her father's surname even after marriage.
7. "Separate family unit" means a family formed by blood and/or marriage plus unpaid servants.
8. If there is more than one wife, children of each wife should be listed in age order after the wife's name. The wife should be given her seniority number.
9. If a wife is childless, this should be noted. "Childless" means that the woman has had no children or that all her children are dead.

10. All particulars for an individual should be listed along the same line in a horizontal direction.
11. The product made should be specified, e.g., baskets, cakes, etc.
12. Night watchmen do not count as residents. These sleep on the verandahs of buildings to protect against theft.
13. Temporary absence counts as residence. Temporary residents are not included.
14. Literacy means reading and writing English. "Arabic" indicates a knowledge of this language for prayers only unless otherwise stated.
15. School: "Arabic" indicates a prayer school only.

On the 29th and 30th July all Census Officers were shown the houses allocated to them and the purpose of the Census was explained to the householder. Each census officer was allocated eight houses, the author had ten.

One head of house refused to give information without payment, and later during the Census, one other house defaulted by evasion. The head of the house was said to be absent and that being so, no one else could give any information.

In giving an explanation for the Census, great stress was laid on the fact that the Census was for health

purposes, and that it had nothing to do with taxation, military service or any connection with the Government.

It should be noted that the notables of the area had been approached a considerable time before, and the Census explained to them, and their approval given. Paramount Chief Bai Kobolo, Pa Seebanah, the Speaker; the Imams; the School teachers, and the Roman Catholic Priest had been seen, their advice sought, and their approval given.

The 31st July, 1959 was chosen for the Census; **i.e., the** night of 30-31st July being the point of reference for all data. This was a Friday, the Moslem Holy Day, and as the majority of Lunsar's inhabitants are Moslems it was considered that it would be more likely that the head of the house would be at home. Other reasons for choosing this day were that it was not a special day socially, or from the work or religious points of view, so that people could be expected to be found at home.

Most of the information was given freely. Sometimes a long explanation was required before collection could begin. Each question was asked, frequently in several ways in order to get an accurate answer. Usually there was a lot of talk before the simplest question could be answered, and much patience was required.

As the collection of data proceeded, the houses defaulting were replaced by other houses drawn by random numbers. It was also found that the collection was long

and exhausting. 20 of the houses contained over 20 persons. The greatest number in one house was 39.

The collection continued over the weekend to complete the scheduled number of houses, but accuracy was not lost because a check was made to see if there had been any change of household composition since the night of 30-31st July, 1959.

It should be pointed out that an African house in town is never empty. There is always an adult and usually some children present. This is because of the fear of theft. In the village, houses are frequently left temporarily unoccupied.

Census forms were then collected from Census Officers and were examined for doubtful items and inconsistencies.

House lists were then put in order number and extraction of some items was carried out.

#### 6.2. Sample Census Data.

Complete extraction of the data was not attempted at this time. The data was checked for inconsistencies and a preliminary extraction of the age and sex distribution was made in Lunsar so that the clinical sample could be drawn.

#### 10% Sample Census of Lunsar, Sierra Leone, 31st July, 1959.

It was ascertained that there were 579 "inhabited houses" in Lunsar, 58 of these selected at random were visited.

Table 4.

10% Sample Census of Lunsar

Distribution of houses and persons in Sectors

	<u>Number of Houses</u>	<u>Persons</u>
Sector A	4	57
Sector B	17	285
Sector C	7	116
Sector D	10	159
Sector E	13	206
Sector F	7	131
	<hr/>	<hr/>
	58	954
	<hr/>	<hr/>

From this survey it was calculated that the population of Lunsar at 31st July, 1959 was 9,540.



Table 5.

10% Sample Census of Lunsar

Sex and Age Distribution

<u>Age</u>	<u>Males</u>	<u>%</u>	<u>Females</u>	<u>%</u>	<u>Total</u>	<u>%</u>
Under 1	21	2.2	15	1.6	36	3.8
1 - 4	37	3.9	54	5.7	91	9.6
5 - 9	66	6.9	73	7.7	139	14.6
10 - 14	48	5.0	27	2.8	75	7.8
15 - 19	32	3.4	62	6.5	95	9.9
20 - 24	34	3.6	44	4.6	78	8.2
25 - 29	62	6.5	63	6.6	125	13.1
30 - 34	37	3.9	34	3.6	71	7.5
35 - 39	55	5.8	43	4.5	98	10.3
40 - 44	26	2.7	17	1.8	43	4.5
45 - 49	19	2.0	19	2.0	38	4.0
50 - 54	7	0.7	13	1.4	20	2.1
55 - 59	9	0.9	8	0.8	17	1.7
60 - 64	10	1.0	6	0.6	16	1.6
65 - 69	4	0.4	5	0.5	9	0.9
70 - 74	1	0.1	2	0.2	3	0.3
75 plus	nil	-	1	0.1	1	0.1
	469	49.0	486	51.0	954	100.0

As a check on this figure, the school population of Lunsar's two schools was taken from the Registers.

1959 July. Numbers of children on school

Registers:-

Roman Catholic School ..... 796

Church of England School ..... 209

1005

Less those living at Marampa ..... 100 approximately

Total School Children on

Registers living in Lunsar ..... 905

The estimated number of school children in Lunsar, from the sample census was 1,050. The difference between this figure and that of the school registers may be explained in the following way.

The total number of children actually at school is difficult to assess because the school registers are affected by the following factors which decrease or increase the numbers registered.

- (a) Children leave when payment of school fees is due. If fees are not paid, the child's name is taken off the Register. The child and its parents, however, still consider it to be a "schoolchild", hence the number in the census appears to be in excess of the numbers on the school Register.

- (b). Number on register does not agree with actual number at school, there being more attenders than are on the Register. These erratic attenders consider themselves to be "school-children".
- (c). The number of children who come to Lunsar R.C. school from the mining compound at Marampa, and who do not live in Lunsar is not accurately known.
- (d). It is estimated that there are 300 persons in the Police Compound, which is not within the census, some of whom are schoolchildren. These children will be on the school registers but not on the census lists.

Making allowances for the factors mentioned it is considered that the difference between the number of children on the school registers, and the estimated number of children who consider themselves to be at school is within reasonable limits.

As a further check, the number of Roman Catholics, estimated to be 520, was considered by Father Milano to be correct.

The sex and age distribution for the inhabitants of the selected houses in Lunsar was taken as the basis of the clinical sample as will be described.

The data from the Sample Census were subsequently put

on Cope-Chat cards and extracted in Edinburgh. See Tables 6, 7 and 8.

### 6.3. Sample Census of Lunsar.

#### Commentary.

The 10% Sample Census of Lunsar refers to the persons in the town on 30-31st July 1959.

#### 6.3.1. Population Structure.

There is much interesting information in the Census and the major points may be discussed. Males and females are in fairly equal numbers in the town 49% males, 51% females, and distribution in the age groups is also fairly even. 36% of the population of Lunsar is under 15 years old, Walters (1958) found 39% of the population of Ilobi, Western Nigeria and Mills (1954, 1955) found 46% and 52% on two islands in the New Hebrides, to be in these age groups.

There appear to be comparatively few children under 5 (13.3% of the population) in the town and this may be due to the custom by which women return to their mother's homestead in the village for confinement and weaning of the child.

My colleague, Dr. D. Gamble, estimated that approximately 25% of women from large towns married in Lunsar, return home for their first confinement. One third of those from large villages, and one half from small villages do the same.







In this connection it should be noted that, by custom, the women are not permitted to have sexual intercourse from the time of the confinement until the infant has been weaned.

This intercourse free period lasts 1 - 2 $\frac{1}{2}$  years after the birth. If the child is born dead, or dies early, one month is the duration of abstinence.

This custom has the effect of spacing out pregnancies. It is rare for a woman to have more than one child every two years. These customs presuppose a polygynous society.

There is a low proportion of older people in Lunsar. Only 10.8% of the population is 45 years or over. Young adults of both sexes are well represented. There are 188 males and 185 females in the age groups 20 - 39 years. 2.9 % are 60 years and over.

There are only half as many males as females in the 15 - 19 group and this may reflect the lack of any secondary educational facilities in Lunsar.

The population of Lunsar resembles in some respects that of Great Britain in 1851-60. At that time 36% of the population was under 15 and 4.7% over 65. The family size was 5.4 and the Infant Mortality rate 140 per 1,000, with a Birth Rate of 34 per 1,000.

It should be noted that the population aged under 20 is larger (435 : 370) than the population between 20 and 40.



It follows that, even if immigrants are left out, the population will tend to increase in the future. This is one specially important example of the general fact that the present age distribution of the population has implications for the future. Four main factors together control the trend of populations.

- (1). Migration.
- (2). Mortality.
- (3). Marriage
- (4). The size of the family.

#### 6.3.2. Civil State.

40% of all males and 55.8% of all females were married. Only 68 (51%) out of 133 males between 20 and 35 years were married, against 132 (93%) out of 141 females in the same age group.

The youngest married females, were 9,10, and 14 years old. 50 out of 62 (80%) were married at 15-19 years.

Since nearly all births occur to married women it is obvious that the proportion of people who marry before they are too old to have children is a factor of basic importance in determining family size and the trend of the population.

A reasonably good index is the proportion of people aged 45 - 54 who have been married.

This figure for Lunsar is 96.5% for both sexes. 92.2% of males and all females in these age groups had

been married.

No males were registered as widowed, presumably because where polygyny is practised the state will be rare. One male stated that he was divorced. Four females stated that they had been divorced and three separated.

Of 188 married males, 147 (78.1%) had one wife, 27 (14%) had two wives, 9 (4.7%) had three wives, 3 (1.6%) had four wives and 2 (1.0%) had five wives, thus 21% of marriages were polygynous, (Table 9). The total number of wives does not necessarily equal the total number of married women in the census.

According to Gamble, 21% of men in Lunsar marry outside their own tribe. Non-Temne men marry Temne women in 69% of the mixed marriages. Non-Temne men marry women of other tribes in 17% and Temne men marry outside their own group in 14% of mixed marriages.

### 6.3.3. Tribe.

The Temne are most numerous at 76.2% of the population. 80% of females and 72.2% of the males being Temne. Limba are second at 7.1% and Fulah third with 5.1%. It will be noted that Lunsar has small numbers of foreigners, i.e., non-Sierra Leoneans, as would be expected. Yoruba and Fanti are from Nigeria and Ghana respectively. The Aku or Oku are Muslim descendants of liberated Africans of Yoruba origin.

Table 9.

Polygyny. Lunsar

Number of wives per married male.

Married Males		Number of Living Wives										Total Wives.
Age in Years	N.	1	2	3	4	5	6	7	8	9	10	
15 - 19	1	1										1
20 - 24	14	13	1									15
25 - 29	30	29	1									31
30 - 34	24	21	2	1								28
35 - 39	47	33	13		1							63
40 - 44	26	20	4	2								34
45 - 49	17	12	3	1	1							25
50 - 54	7	4	2	1								11
55 - 59	8	6	-	1	1							13
60 - 64	9	5	1	2	-	1						18
65 - 69	4	2	-	1	-	1						10
70 - 74	1	1										1
75 plus	-	-										-
TOTAL	188	147	27	9	3	2						250
PER CENT		78.1	14	4.7	1.6	1.0						

The Syrians are the group of Lebanese traders, many of whom established themselves in Sierra Leone at the end of the nineteenth century, when all were "Syrians", coming from the Lebanon. The Lebanon was at that time part of the Ottoman Empire.

#### 6.3.4. Birth Place.

30.3% of males and 27.3% of females were born in Lunsar. It will be noted that there is a high rate of Lunsar born persons in the youngest age groups but this proportion rapidly diminished and in the 15 - 19 age group already four times as many persons were born outside Lunsar as were born in the town.

A list of birthplaces of persons domiciled in Lunsar shows the highest proportions of persons came from neighbouring Chiefdoms such as Marampa-Masimera and Buya Romende. Freetown, Hastings, Waterloo, Makeni and Kambia are also represented as are places outside Sierra Leone, such as Guinea. Some difficulty is created by the frequent repetition of place names even within the same chiefdom, so that unless special enquiry is made the name of the birth place itself may not be sufficient for precision. Since many females return to their mother's village for confinement and weaning of the child, this custom will tend to augment the rate of persons born elsewhere even if they are truly domiciled in Lunsar. On the other hand it is unusual for a female in a village

to move out of the village for her confinement.

#### 6.3.5. Residence in Lunsar.

22.1% of males and 24.3% of females have been in Lunsar less than 2 years. 33% of both sexes over 4 years of age have lived in Lunsar less than 2 years, and 31.1% of both sexes have lived in Lunsar ten years or more. Immigration into Lunsar is thus occurring at a considerable rate. This influx is from both villages and large towns.

#### 6.3.6. Languages.

Temne dominates with 89.2% speaking the language. Creole is spoken by 20.5% and English by 11.5%. 17.9% of males but only 5.3% of females speak English. English speakers are relatively more numerous in the younger age groups. Many persons speak more than one language. Mende is spoken by only 3% of the population.

Under the heading "other" there are many languages:-

Mandingo	Fulah	Limba
Vai	Loko	Arabic
Susu	Yoruba	

#### 6.37. Religion.

The Muslim faith dominates at 80.8%. Roman Catholics, Protestant and Pagan are about equal between 5 and 6% of the population. The Muslim religion or any other for that matter, sits lightly on the Africans as there is no seclusion of the women in the home, nor veiling nor se-

gregation. In fact the impression gained is that of a society in which women have considerable freedom and power. The estimated Roman Catholic population of Lunsar, agrees with the actual figure given by the Catholic Fathers.

#### 6.3.8. Education.

27.8% of males and 8.2% of females were attending or had attended either the Roman Catholic or Church of England Schools in Lunsar, or Government or Mission Schools elsewhere. Only in these schools are English, reading, writing and arithmetic taught. 37% of children between 5-14 attend school, 52.6% of males and 24% of females, compared with 11% in the age group 25 - 34 who were attending school 20 years ago. In 1959, there were 796 pupils at the Roman Catholic School and 209 at the Church of England School.

At the Arabic or Koranic Prayer Schools, verses from the Koran are memorised. These verses are inscribed on boards with a hot iron and the pupils chant these verses until they are learnt by heart. Literacy in the Arabic language is rarely achieved, although some pupils in Lunsar had attained it. This was due to the Imam Kabia of Lunsar who had studied in his youth at the Al Azhar University in Cairo, and was himself an Arabic scholar.

In most Koranic Schools, the pupils act as unpaid labourers on the farms of the Imam or the Alfa.

The Imam is the leader of the Muslim Community and the Alfa is a Koranic teacher. Girls attending Koranic schools are mainly from the families of the Imam or Alfa.

School attendance was rising rapidly in Lunsar as the following figures for the Roman Catholic School show.

Register of Roman Catholic School, Lunsar

Jan. 1935	35 pupils.
Jan. 1940	108 pupils.
Jan. 1945	106 pupils. 16% females
Jan. 1950	208 pupils. 25% females
Jan. 1955	360 pupils. 35% females
Jan. 1956	440 pupils.
Jan. 1957	498 pupils.
Jan. 1958	720 pupils.
Jan. 1959	822 pupils.

6.3.9. Literacy.

21.6% of males and 5.1% of females are literate in English. This is surprisingly high and is in the younger age groups as would be expected.

True literacy in Arabic is probably rare although 26.3% of males and 7.6% of females said they were literate in this language.

6.3.10. Occupation.

Persons frequently have more than one occupation and change jobs repeatedly.

(a) "House"

1.0% of males and 40.1% of females gave this as their occupation.

The collecting, preparation and cooking of food will take up a considerable part of their time as well as care of infants. There is little actual housework to be done in an African house as the furniture is sparse and some sweeping out is all that would be done. Washing of clothes takes up some time. Most women probably undertake the preparation of foodstuffs, e.g., ground nuts, cakes, akidee, etc., and these are sold by a member of the family, probably a small girl.

The women also look after the vegetable gardens around the house and in the swamp areas, and any surplus will be sold. Women also run the small "restaurants" of Lunsar and carry on the traditional crafts of dyeing with indigo and basket making. The sale of palm wine is in their hands.

There were two men only, who gave their occupation as in the "house". These men were family servants, unpaid, of the old type.

(b). "Farmer"

13.6% of males and 5.8% of females gave "Farmer" as their occupation. Lunsar is ringed with rice swamps and this important cereal (containing 8% protein and vitamins of the B complex) is the most important crop



and forms the staple diet of the people. The care and cultivation of rice is described in the section on Rural Economy in the Appendix. Palm oil and palm kernels are also important products.

Farming goes on, in and around Lunsar. The swamp rice is sown on lawns in among the houses, and the seedlings are later transferred to the neighbouring swamps. The amount of land around Lunsar is limited in extent and this is reflected in the comparatively small number of farmers.

(c) "Trader"

7.2% of males and 40.3% of females gave this as their occupation. 12 girls in the age group 5 - 9 gave their occupation as trader.

Trading includes preparation of foodstuffs for sale, collection and sale of firewood and running a small store. The small girls, and many grown women also, carry trays on their heads selling their wares in town and over in the mining compound. At night the main streets of Lunsar are lined with these girls and women traders, all sitting behind a tray illuminated with a small kerosene lamp made out of a condensed milk tin. Groundnuts, kola nuts, cigarettes sold individually, etc., are for sale.

There are many African shops, from the simplest with a few items, including tinned food, to the more elaborate where watches, cloth and trinkets can be bought, and farm produce bought and sold.

It is difficult in the Lunsar situation, to demarcate "House" and "Trader" into occupational groups. Probably almost all women take part in petty trading of one sort or another, so that these distinctions must not be taken too rigidly.

The fishing industry of Sierra Leone is virtually controlled by the fish traders, almost invariably women, who provide the capital required for the purchase of gear and other expenses. It is noteworthy that women are considered to be more trustworthy than men in financial matters.

(d) "Industry".

25.6% of the males and no females are employed in industry, i.e., 43.3% of males aged 15 - 54. There is only one industry involved, the Sierra Leone Development Company's open cast mine, but there is a great variety of occupation and skills involved within the industry and in its transport system. Contractors working for the S.L.D.C. are included in this section. The mining occurs on the hills of Masaboin and Gbafal near Lunsar.

Four grades of haematite ore are exported, lump ore, fines, concentrates and ferromax with respective iron contents of 55%, 58%, 65% and 69%.

Mining is done mechanically with the most modern earth moving equipment. The crude ore is transported by conveyor belt to the mill where it is washed and

concentrated. The refined ore is carried by conveyor belt to the railway wagons and it is taken by the Company's own railway to Pepel, 52 miles away, where it is loaded mechanically into ships. In 1958 the output was 1,421,563 tons valued at £4,490,460.

In such an industry there are many varieties of occupation from administrator, and civil engineer through all grades down to labourer. The engineering and maintenance side of the industry alone is a vast undertaking. Africans occupy all grades of position in this industry.

Mine workers get a kettle of rice (about 20 lbs) in addition to their wages every two weeks.

The following is a list of some of the occupations in industry:-

Administrator	fitter	sanitary headman
boiler maker	gardener	secretary
carpenter	greaser	shunter
clerk	labourer	steward
cook	loader	storeman
driver - crane	mechanic	telemechanic
- dumper	mill appren- tice	time-keeper
- Euclid	miner	ward attendant
- tractor	motor appren- tice	watchman
- transport	nurse	welfare department worker
electrician	painter	
electrician-apprentice	plumber	
engineer	railway labourer	
engineer-apprentice	sanitary labourer	

(e) "Government"

1.9% of males and no females are employed by the Government. These persons are Native Administration personnel such as clerks and Court Messengers, now called Chiefdom Police. The medical and sanitary personnel are also Government employees as are Public Works Department Staff.

(f) "School"

In this context only the Roman Catholic and Church of England Primary Schools are considered.

57% of the males from 5 - 14 are at school and 24.7% of the girls in the same age groups. It is thus the accepted thing for a male child to go to school but only 1 in 4 of female children get any schooling.

(g) "Other" occupations

This group includes the following occupations:-

<u>Males</u>	<u>Females</u>
Baker.	Basket maker.
Blacksmith.	Brothel keeper.
Builder.	Dyer of clothes.
Butcher.	Fish net maker.
Carpenter.	Prostitute - Rally girl.
Clerk - Bank.	Seamstress.
Contractor.	
Cook.	
Driver.	
Mason.	
Palm wine tapper.	
Sevant.	
Shoe Repairer.	
Tailor.	
Watchman.	

Many persons change their jobs quite frequently.

22.2% of males and 31.2% of females gave the above as their occupations.

(h) "None"

This was given as occupation by 18.3% of the males and 22.6% of the females.

A study of the age distribution of these groups reveals that 82.7% are under 15 years and the majority in the older groups are females.

In the taking of the census one did find a few able bodied young men who insisted that they had no occupation and that they were living with relatives.

6.3.11. Employment Status.

18.5% of males and 8.4% of females are employed on their "own account". This rate for females seems low judging from the numbers of traders. It may be, however a measure of the way in which petty traders are financed by other members of the household.

19.4% of males and 64.4% of females are "unpaid family workers". 66% of these males are under 20 years old. The older male unpaid family workers are family servants in the old style.

The rates for "employee industry" are the same as the occupational rates for industry.

"Employee other" is 7.1% for males and 1.6% for females. The list of common occupations for this group has already

been given.

Unemployed.

7.8% of males and 1.6% of females gave this as their occupational state. The term covers many conditions, and refers to persons 15 years and over.

- (a). Young men who have left school and not yet found employment.
- (b). Men from the villages who leave their farms in the dry season to take extra work in the town for this period of time, and who have not found it.
- (c). Persons who have made money in the past and who are living on it until it is finished.
- (d). A criminal element who live as thieves, gamblers, procurors, drug pedlars, etc.
- (e). People who avoid work and live sponging on relatives and friends.
- (f). Persons unable to work, the physically or mentally handicapped.

6.3.12. Place of Work.

11.5% of males and 49.4% of females gave the homestead as their place of work. Traders, apart from the street vendors, do business from their houses which are part shops. Handicrafts and even motor repairs may take place at home. The place of work for those engaged in industry is on the mine installations.

"Other" places of work include the streets, the market, verandahs of Syrian shops where tailors are installed, and the fields which may be situated some distance away.

The bakery, the school or the Government Department are also in the category "other".

### 6.3.13. Produce.

3.6% of males and 20% of females make some product at home for sale or barter. As already stated under the headings "House" and "Trader" a wide variety of things are prepared at home. These include foods of all kinds, preparation of cloth, making of clothing, furniture, shoes, hardware, and other articles.

### 6.4 Housing.

The houses are mostly rectangular in shape unlike the traditional Temne round house. There are five round houses (0.8%) out of 579 in Lunsar and none came into the sampling.

#### House Types.

In the 10% sample surveyed, i.e., 58 houses, the types of construction were as follows:-

Thatch roof, sticks and mud walls.	21	36.2%
Thatch roof, mud block walls.	6	10.3%
Corrugated iron roof, sticks and mud walls.	10	34.4%
Corrugated iron roof, mud block walls.	9	15.5%
Corrugated iron roof, cement block walls.	2	3.4%
	<hr/>	<hr/>
	58	99.8%

Thus 27 (46.5%) have a thatch roof, and 31 (53.3%) have a corrugated iron roof. 43 (74%) floors are of mud, and 15 (26%) of cement.

The building regulations of the Government lay down the minimum requirements of 120 square feet floor area, and 10 feet minimum average height for living rooms. These regulations are adhered to reasonably well in new constructions but many houses have rooms used for sleeping with a much smaller floor area. The typical house has a central room, sometimes subdivided, surrounded by smaller rooms. There is usually a through-passage from the front verandah to the back verandah. There may be subsidiary buildings, usually detached, which belong to the main house, containing kitchen, store rooms (for wood etc.) and even extra bedrooms. There may be a covered way between the main house and the subsidiary buildings.

#### Number of rooms.

The number of rooms in a house, excluding the kitchen, toilet or storerooms was found to range from 1 to 16. 31 (53.4%) out of the 58 houses had between 7 and 9 rooms. All types of room, excluding kitchen, toilet or storerooms, were used as sleeping quarters. 58 houses have 467 rooms, a mean of 8 rooms per house.

#### Density.

A total of 467 rooms were inhabited by 954 persons, a density of 2 persons per room. 58 houses were inhabited



by 155 separate family units and 64 single persons. 5.7 persons per family unit, a density of 2.7 family units per house. Many single persons have one room in a house. This is often kept padlocked during the day while the person is away at his work. Mean number of persons per house is 16.4 ranging from 1 to 39. Mean family size is 5.7 persons. Little (1945) found an average of 5.3 to 8.4 persons to a house in villages and towns in 4 Chiefdoms in eastern Mendeland in 1945. The designation "family unit" means what the Temne consider to be a family. This social unit is being studied by Littlejohn.

As will be seen from the figures and census records many households in Lunsar are composed of unrelated families.

The household head - tenant relationship is commonest at about 75%. The Masin or in-law relationship is about 10%.

#### Overcrowding.

In various studies in Great Britain, overcrowding has been correlated with high incidence of pulmonary tuberculosis, measles, cerebro-spinal meningitis, diphtheria and acute rheumatism. It has also been shown to affect adversely the infant mortality rate with which it correlates and the mortality rates of the pre-school child. In the housing survey of 1935, the percentage of families

overcrowded in Scotland was 22.6 (Infant Mortality, 1943).

In Scotland, overcrowding favours the spread of all respiratory infections and the poor standard of sanitation and domestic water supplies will greatly increase the risk of gastro-intestinal disease. In this way the infants are subjected to repeated or mass infections of the most varied type.

In the tropical situation I would not consider overcrowding to have quite the same importance. For most of the time in the tropics, life is lived outdoors and only at night are the doors and shutters tightly closed and the effects of overcrowding most marked.

The Housing (Scotland) Acts, 1950 and 1957 lay down definitions of overcrowding:

A house is overcrowded when the number of persons sleeping in the house either

- (1). is such that two persons, ten years old or more, of opposite sexes not living together as husband and wife, must sleep in the same room; or
- (2). is, in relation to the number and floor area of the rooms, in excess of the following (whichever

is the less):-

<u>Number of rooms</u>	<u>Number of Persons</u>
1	2
2	3
3	5
4	7½
5 or more	10, with an additional 2 in respect of each room in excess of five.

<u>Floor area of rooms in sq.ft.</u>	<u>Number of Persons</u>
110 or more	2
90 - 110	1½
70 - 90	1
50 - 70	½
under 50	Nil

A child under 1 does not count and a child 1 - 10 is reckoned as half a unit.

In estimating the rate of overcrowding for each house, the number of persons per room was estimated, and compared with the permitted standard. In Lunsar 3.8% of the population is under 1 year and 24% between 1 and 10 so that the total number of persons in a given house was corrected to allow for infants and children in this age group.

Since infants are not counted and half of the children between 1 and 10 are counted as adults the number of persons in a house was corrected by a factor of

3.8% + 12% = 16% approximately.

The calculation was made to the nearest whole number of persons.

On this basis it was found that 21 houses were overcrowded out of 58, i.e., 36.2%

#### Ownership.

51 (88%) out of 58 houses were inhabited by the owner. 7 (12.0%) households were in rented houses. 33 houses had their own food gardens.

#### Latrines.

51 (88%) houses had their own deep pit latrines. Each latrine thus serves 18 persons.

#### Water Supply.

43 (74.1%) used the town piped rain water supply from nearby standpipes. Eight households had their own wells and seven used the two rivers.

#### Area of Lunsar.

As Lunsar is roughly circular in shape it may be taken to lie within a circle of radius of 800 yards.

By calculating in this way, Lunsar has an area of 0.65 square miles (415.4 acres)(1.685 sq.km.) giving a population density of 15,000 persons per square mile (24 per acre)(5,952 per sq.km.).

#### Summary.

From the 10% Sample Census it is evident that Lunsar is a town of about 10,000 people with an even sex

distribution and a comparatively high proportion of young adults. The people are mainly Temne and Muslim and under one third were born in the town.

One fifth of the males are literate and one quarter of males are occupied in industry which is the largest occupational group. Almost all houses are rectangular and over half have corrugated iron roofs, and contain about 8 rooms and have a density of 2 persons per room and 16 per house.

88% of houses had their own latrines and 74% used the town piped water supply.

## 7. Lunsar Survey - The Clinical Survey.

### 7.1. Clinical Sample.

#### Method.

A new schedule was drawn up bearing in mind the difficulties encountered in the pilot. A copy of this will be found in the Appendix.

It was intended to see as many of the 952 persons who were listed in the 10% Random Sample Census as possible. Examinations commenced on 26th August, 1959.

The day before a clinic, the selected inhabited houses were visited by my interpreter, Alfa Kabia, and all persons in the house were requested to present themselves at the clinic on the following morning for examination. Only a fraction of those listed used to turn up but the households were informed that persons from the house could come any morning to be examined and treated, and that the healthy were equally welcome with the sick. All children were given a sweet after examination and medical treatment was provided either in the morning or at the afternoon session.

The names and particulars of each person were checked with the Census List and the Index Number of the clinical schedule was put onto the Census List. Very often people changed their names; one person did this three times. They often did not know the name of the head of the house in which they lived and women often did not know

the proper names of their husband.

As the clinical survey progressed and people found that medical treatment was being given free, many tried to get included by stating that they should have been in the Census List but were in fact away when it was taken, for example, in the market. Cases of this kind were included but the names were underlined in blue to indicate that they were not on the original census.

Religion, occupation and birthplace were all given differently at different times and inexhaustible patience was required to get the facts reasonably accurate.

"Duration of stay in present place" is usually a guess but one can distinguish between a short time (weeks or a few months) and a long time (years). Height was taken in centimetres and weights in kilograms. Clothes were worn during the weighing. Most African men wear shorts or trousers and shirt and sometimes a long gown. The women wear seven or more garments. There is, frequently, an outer lapa, then the frock, and under this a series of lapas (pieces of cloth wound round the waist) some of which are of heavy cloth or towelling and occasionally knickers are worn. Almost always there are several strings of beads round the lower abdomen above the great trochanters (one girl had 64 strings) and this is used as a sort of belt, the inner lapa being tucked into this.

Head scarves are also worn by all the females except the very young. The bulk around the middle and the buttocks which this fashion creates is considered to be sexually attractive. Marco Polo made the same observation about the women in Afghanistan "pour faire croire qu'elles ont de grosses fesses ce dont les hommes se delectent beaucoup".

#### Clinical Examination - Lunsar

The schedule was gone through in the following manner. Civil data were checked with Census data, the person was measured and weighed. The examination of the eyes with a hand lens was carried out and signs of nutritional deficiency were sought. Teeth were examined, natural and artificial pigmentation of the gums was seen, the whole of the oral cavity being carefully examined.

Spleen was palpated with the patient standing and a careful palpation of the iliac crests, natal cleft and sacral regions and other sites was made for nodules of onchocerciasis. The natal cleft was a common site for these nodules, and they were found on the inner side of the knee in one case.

When women were examined, males were sent outside and a woman companion was allowed to stay with the patient. There was never any difficulty over the examination of a female.



At a point during the examination blood was taken. This thick blood film was examined as a wet preparation for microfilaria and on several occasions *Acanthocheil-  
onema perstans* were found. The thick film was dried and later stained by Giemsa and examined in the afternoon for Plasmodia. Haemoglobin was measured by the Tallquist Scale at the time blood was taken. A skin snip was also taken for onchocerciasis. The method is described in the Appendix under Laboratory Methods.

The skin snip was not usually performed on those under one year. Blood pressure was measured on all those big enough to take the Sphygmomanometer cuff.

A urine examination on males was performed. One Albustix and one Clinistix was given to each male and he was directed to micturate over them on the rubbish dump at the side of the clinic. As all males and many small girls pass urine openly on the streets this procedure was not considered to be immodest. Females were questioned carefully about their obstetric histories and with care reasonably accurate information was collected.

The skin snip and blood films were taken by Mr. Anthony Opoku of the Endemic Diseases Control Unit at Marampa. I should like to pay a tribute to his efficiency, skill and cheerfulness; without him it would have been impossible to get through the work.

The clinic lasted from 7.30 a.m. to midday. Blood films were stained in the lunch hour and read in the afternoon. Ten minutes was given to each slide and read by both of us. Patients requiring dressings or injections were seen during this period. Between 12 and 16 schedules were completed in each working day.

At an average rate of 12 persons per working day it became necessary to get a target figure for the sample and it was considered feasible to collect a 40% sample of the census which would be, therefore, a 4% clinical sample of all Lunsar. The figures for a 40% sample of each sex and age group in the Census were then calculated. By 7th October, 1959, 330 persons had been seen and the age and sex distribution of clinic attenders was made and compared with the 40% sample. It was found that there was an excess of females (as would be expected) and that males in the working age groups (25-39) would be required in order to make the sample comparable proportionately in sex and age distribution with the census.

The males from the selected houses were encouraged to come forward and Saturdays and Sundays were worked to facilitate this. By the end of October, 392 persons had been seen. For the last week of the clinical sample persons were called forward by name from the houses and the sample was finally completed. A total of 449 persons had been examined. The census lists were thus the basis

of the sampling. The data on the Census list was checked with the same data given on the clinical schedule in order to correlate and compare the two samples.

A 40% sample was thus drawn from persons on the original census, proportionately comparable in sex and age. The final sample was 380 persons, 189 males and 191 females. This is a 4% Random Sample of Lunsar.

It will be noted that 69 persons not included in the Sample were examined taking up about five working days. This is because people came for medical treatment pretending that they were on the house lists of the sample census. This was difficult to check because names are so repetitive, but the team got better at identification as the survey progressed, and the wastage rate fell to zero towards the end. The persons who had been examined and for whom a schedule had been completed and who turned out not to belong to the sample were excluded.

It is evident from the numbers of people who came for medical treatment pretending that they were on the house lists of the sample census, that medical care was attractive, and therefore, the sick tended to come and so the clinical sample may have been biased by self-selection.

Also the women and children tended to come, after the initial influx of males probably because they had more time.

At the clinical examination, in response to the question "How are you keeping" 60% of males and 64% of females made a complaint about their health or that of their children. This leaves a large proportion of both sexes who made no complaint at all. This in spite of the fact that 75.3% of both sexes and all ages had circulating *P. falciparum* in the blood, and 40.5% of both sexes and all ages had nodules of onchocerciasis.

Many people must, therefore, have come to the clinic because they were requested, because the child got a sweet, or because they were curious as well as on account of sickness.

It may, therefore, be assumed that the clinical sample is as unbiased as it is feasible to collect in the circumstances of an African town.

The data was put onto Cope-Chat cards and extracted in Edinburgh. (See tables).

Since arrival in Lunsar I had carried on a general medical clinic for the people without charge.

This was because I felt I had an ethical duty to give help as the only doctor in the community; in addition it gave me the opportunity to get to know the people, to see inside their homes and to learn about the pattern of disease in Lunsar.

Many cases were referred to me by the Dispenser and also by the witch doctor, Pa Ballah, with whom I had friendly relations.

It was difficult, if not impossible, to give free medical services to all in an African township of 10,000 people. The amount of work and time taken up by such a case load would prevent any research being done. On the other than, to refuse to give medical care where needed would have alienated the people. The fact that any really sick person would be seen, whether on the house lists or not, finally cut down the pretenders to a negligible figure. Even so, the amount of clinical work done, in addition to the amount concerned with the sample, was very large. I gave much thought to this problem but came to the conclusion that the course which I took was the only practical solution.

## 7.2. Comparison of Census and Clinical Samples.

In order to validate the Clinical Sample, census material from the clinical schedules was extracted and is set out in Tables 10, 11 and 12.

### 7.2.1. Sex and Age Structure.

From the method of taking the Clinical Sample it is comparable by sex and age with 40% of the Census Sample.

### 7.2.2. Tribe.

In Tables 10, 11 and 12, Tribe "other" includes Syrian, 1 male, 1 female; Creole, 2 males,; Mandingo, 3 males, 1 female; Susu 2 males, 1 female; Yoruba, 1 female.

TABLE 10

## CENSUS DATA OF CLINICAL SAMPLE, LUNSAR

MALES

AGE IN YEARS	N	Age Group as % Total	TRIBE					PLACE OF BIRTH					RESIDENCE LUNSAR IN YEARS				RELIGION				LITERACY	OCCUPATION					
			Temne	Mende	Fulah	Limba	Loko	Other	Born Lunsar	< 2	2 - 5	6 - 9	10 plus	Muslim	Roman Catholic	Protestant	Pagan	Literate In English	House	Farmer	Trader	Industry	School	Other	None		
Under 1	8	4.2	8	-	-	-	-	8	8	-	-	-	6	-	1	1	-	-	-	-	-	-	-	8			
1 - 4	16	8.5	13	-	2	-	1	13	5	11	-	-	14	1	1	-	-	1	-	-	-	-	-	15			
5 - 9	26	13.7	23	2	-	-	1	14	3	11	12	-	16	8	1	1	9	6	-	-	-	15	1	4			
10 - 14	19	10.0	17	-	2	-	-	8	1	5	3	10	13	5	1	-	12	2	2	-	-	15	-	-			
15 - 19	14	7.4	13	-	-	1	-	-	4	7	1	2	11	3	-	-	4	2	4	2	2	2	2	-			
20 - 24	14	7.4	9	-	-	2	-	4	4	4	-	6	12	-	1	1	6	-	3	3	5	-	3	-			
25 - 29	26	13.8	24	-	-	1	1	2	4	14	2	6	25	-	-	1	2	-	5	3	12	-	6	-			
30 - 34	16	8.5	13	-	1	1	-	3	2	6	1	7	15	-	-	1	1	1	3	4	5	-	3	-			
35 - 39	20	10.6	14	-	2	1	1	4	3	3	-	14	19	-	1	-	5	1	3	1	12	-	3	-			
40 - 44	10	5.3	6	-	-	2	2	-	3	1	3	3	9	1	-	-	2	-	1	1	4	1	3	-			
45 - 49	10	5.3	8	-	-	-	-	1	-	-	1	9	10	-	-	-	1	-	3	2	1	-	4	-			
50 - 54	1	0.5	1	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	1	-	-	-	-			
55 - 59	4	2.1	2	-	2	-	-	-	-	1	-	3	4	-	-	-	-	-	3	-	-	-	-	1			
60 - 64	3	1.6	3	-	-	-	-	-	1	-	-	2	3	-	-	-	-	-	3	-	-	-	-	-			
65 - 69	2	1.1	1	-	1	-	-	-	-	-	-	2	2	-	-	-	1	-	1	1	-	-	-	-			
70 - 74	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
75 Plus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
TOTAL	189	100.0	155	2	10	8	6	8	57	38	63	23	65	160	18	6	5	43	13	31	18	41	33	25	28		
%			82.0	1.1	5.3	4.2	3.2	24.2	30.2	20.1	33.3	12.2	34.4	84.7	9.5	3.2	2.6	22.8	6.9	16.4	9.5	21.7	17.5	13.2	14.8		

TABLE 11

## CENSUS DATA OF CLINICAL SAMPLE, LUN SAR

## FEMALES

AGE IN YEARS	N	Age Group as % Total	TRIBE						PLACE OF BIRTH					RESIDENCE LUN SAR IN YEARS				RELIGION				LITERACY		OCCUPATION								
			Tenne	Mende	Fulah	Limba	Loko	Other	Born Lun sar	< 2	2 - 5	6 - 9	10 Plus	Muslim	Roman Catholic	Protestant	Pagan	Literate in English	House	Farmer	Trader	Industry	School	Other	None							
Under 1	6	3.1	5	-	-	1	-	-	5	6	-	-	-	4	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
1 - 4	22	11.5	19	-	-	2	1	-	15	9	13	-	-	17	-	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-	19	
5 - 9	29	15.2	25	-	2	1	1	-	11	8	10	11	-	25	4	-	-	3	11	1	8	-	6	6	-	-	-	-	-	3		
10 - 14	13	6.8	11	-	1	1	-	-	6	2	1	2	8	12	-	-	1	1	8	1	7	-	3	2	-	-	-	-	-	-		
15 - 19	22	11.5	19	1	1	1	-	-	8	5	6	1	10	15	1	-	6	3	15	5	10	-	3	3	-	-	-	-	-	-		
20 - 24	17	8.9	11	1	-	4	-	1	2	2	9	1	5	11	1	2	3	1	17	2	12	-	-	-	-	-	-	-	-	-		
25 - 29	25	13.1	20	1	2	-	-	2	3	6	5	2	12	21	1	1	2	1	24	1	12	-	-	1	-	-	-	-	-	-		
30 - 34	13	6.8	9	-	-	1	3	-	1	1	2	5	5	11	-	-	2	-	11	1	8	-	-	1	-	-	-	-	-	-		
35 - 39	18	9.4	15	-	1	2	-	-	2	1	5	6	6	16	-	-	2	-	17	4	10	-	-	-	-	-	-	-	-	-		
40 - 44	6	3.1	5	-	-	1	-	-	1	1	-	-	5	6	-	-	-	-	5	4	2	-	-	1	-	-	-	-	-	-		
45 - 49	9	4.7	6	-	2	-	-	1	1	2	1	1	5	8	-	1	-	1	8	2	5	-	-	1	-	-	-	-	-	-		
50 - 54	2	1.1	2	-	-	-	-	-	1	-	-	-	2	2	-	-	-	-	1	1	1	-	-	1	-	-	-	-	-	-		
55 - 59	3	1.6	3	-	-	-	-	-	-	-	-	-	3	2	-	-	1	-	2	-	3	-	-	-	-	-	-	-	-	-		
60 - 64	3	1.6	2	1	-	-	-	-	-	1	-	-	2	3	-	-	-	-	3	-	3	-	-	-	-	-	-	-	-	-		
65 - 69	3	1.6	3	-	-	-	-	-	-	2	-	-	1	3	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-		
70 - 74	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
75 Plus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Total	191	100.0	155	4	9	14	5	4	56	46	52	29	64	156	7	7	21	10	124	22	83	-	12	16	-	-	-	-	-	30		
%			81.2	2.1	4.7	7.3	2.6	2.1	29.3	24.1	27.2	15.2	33.5	81.7	3.7	3.7	11.0	5.2	64.9	11.5	43.5	-	6.3	8.4	-	-	-	-	15.7			

TABLE 12  
CENSUS DATA OF CLINICAL SAMPLE, LUN SAR

TOTAL

AGE IN YEARS	N			Age Group as % Total	TRIBE						PLACE OF BIRTH					RESIDENCE LUN SAR IN YEARS				RELIGION				LITERACY		OCCUPATION					
	M	F	T		Temne	Mende	Fulah	Limba	Loko	Other	Born Lun sar	< 2	2 - 5	6 - 9	10 Plus	Muslim	Roman Catholic	Protestant	Pagan	Literate in English	House	Farmer	Trader	Industry	School	Other	None				
Under 1	8	6	14	3.7	13	-	-	1	-	-	13	14	-	-	10	-	1	3	-	-	-	-	-	-	-	14					
1 - 4	16	22	38	10.0	32	-	2	2	2	-	28	14	24	-	31	1	4	2	-	3	-	1	-	-	-	34					
5 - 9	26	29	55	14.5	48	2	2	1	2	-	25	11	21	23	41	12	1	1	12	17	1	8	-	21	7	7					
10 - 14	19	13	32	8.4	28	-	3	1	-	-	14	3	6	5	25	5	1	1	13	10	3	7	-	18	2	-					
15 - 19	14	22	36	9.5	32	1	1	2	-	-	8	9	13	2	26	4	-	6	7	17	9	12	2	5	5	-					
20 - 24	14	17	31	8.2	20	1	-	6	-	4	6	6	13	1	23	1	3	4	7	17	5	15	5	-	3	-					
25 - 29	26	25	51	13.4	44	1	2	1	1	2	5	10	19	4	46	1	1	3	3	24	6	15	12	-	7	-					
30 - 34	16	13	29	7.6	22	-	1	2	3	1	4	3	8	6	26	-	-	3	1	12	4	12	5	-	4	-					
35 - 39	20	18	38	10.0	29	-	3	3	1	2	6	4	8	6	35	-	1	2	5	18	7	11	12	-	3	-					
40 - 44	10	6	16	4.2	11	-	-	3	2	-	1	4	1	3	15	1	-	-	2	5	5	3	4	-	4	-					
45 - 49	10	9	19	5.0	14	-	2	-	-	3	2	2	1	2	18	-	1	-	2	8	5	7	1	-	5	-					
50 - 54	1	2	3	0.8	3	-	-	-	-	-	1	-	-	3	3	-	-	-	-	1	1	2	-	-	-	-					
55 - 59	4	3	7	1.8	5	-	2	-	-	-	-	-	1	6	6	-	-	1	-	2	3	3	-	-	1	1					
60 - 64	3	3	6	1.6	5	1	-	-	-	-	-	2	-	4	6	-	-	-	-	3	3	3	-	-	-	-					
65 - 69	2	3	5	1.3	4	-	1	-	-	-	-	2	-	3	5	-	-	-	1	-	1	2	-	-	-	2					
70 - 74	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
75 Plus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
TOTAL	189	191	380	100.0	310	6	19	22	11	12	113	84	115	152	129	316	25	13	26	83	137	53	101	141	45	41	58				
%	49.7	50.3	100		81.6	1.6	5.0	5.8	2.9	3.2	29.7	22.1	30.3	13.7	33.9	83.2	6.6	3.4	6.8	13.9	36.1	13.9	26.6	10.8	11.8	10.8	15.3				



Table 13

Comparison of Tribal Affiliation Rates in Census and  
Clinical Sample

		Census Sample %	Clinical Sample %
Temne	M	72.2	82.0
	F	80.0	81.2
	T	76.2	81.6
Mende	M	2.3	1.1
	F	2.2	2.1
	T	2.3	1.6
Fulah	M	5.9	5.2
	F	4.3	4.7
	T	5.1	5.0
Limba	M	7.6	4.2
	F	6.5	7.3
	T	7.1	5.8
Loko	M	4.7	3.2
	F	2.4	2.6
	T	3.5	2.9
Other	M	6.9	4.2
	F	4.2	2.1
	T	5.4	3.2

The numbers are small in the Clinical Sample but the proportions of the tribal affiliation rates are similar.

7.2.3. Place of Birth - Lunsar.

30.3% of males and 27.3% of females in the Census were born in Lunsar, compared with 30.2% of males and 29.3% of females in the Clinical Sample.

7.2.4. Residence in Lunsar.

A study of the tables showing length of stay in Lunsar shows that the Census sample and the Clinical Sample are of a very similar pattern.

7.2.5. Religion.

		<u>Census Sample</u>	<u>Clinical Sample</u>
		%	%
Muslim	M	78.6	84.7
	F	82.9	81.7
	T	80.8	83.2
Roman Catholic	M	9.1	9.5
	F	3.2	3.7
	T	6.1	6.6
Protestant	M	6.4	3.2
	F	3.9	3.7
	T	5.1	3.4
Pagan	M	5.7	2.6
	F	9.8	11.0
	T	7.8	6.8

7.2.6. Literacy.

13.2% of males and 5.1% of females in the Census are literate in English.

The rates for the clinical sample are 22.8% for males and 5.2% for females; this shows a bias towards literacy.

The great difference between the sexes shows clearly in these figures more males being literate than females.

The two means for both sexes are 13.2% for the Census Sample and 13.9% for the Clinical Sample.

#### 7.2.7. Occupation.

As has been stated in a previous section, more than one occupation is frequently carried on by a person and occupations are frequently changed.

When asked their occupation persons might give three, e.g., "house", "farmer", "trader", and it is difficult to know which is the more important. Different occupations may predominate at different times.

There is thus some variability when the same sex is compared in the two samples, although the trends in both samples are the same.

The two most certain of the occupations in the sense that they are most likely to be reported are "Industry" and "School" and it will be seen that the two samples correspond well.

Males in industry are 25.6% of the Census Sample and 21.7% in the Clinical Sample. No females are employed in industry. Males at school are 16.0% in the Census and 17.5% in the Clinical Sample. One male is a schoolmaster.

Schoolgirls are 6.3% in the Census and 6.2% in the Clinical Sample.

The rates for Trader for females is 40.3% in the Census and 43.4% in the Clinical Sample.

"Other" includes the following occupations.

<u>Males.</u>	Butcher	2	Koranic Schoolboy	2
	Carpenter	2	Lorry Apprentice	1
	Cook	1	Mason	1
	Court messenger	2	Public Works Dept. Labourer	1
	Imam	1	Tailor	11
	Interpreter	1		
<u>Females.</u>	Brothel keeper	1	Palm wine seller	2
	Dyer of cloth	3	Prostitute	1
	Fish net maker	1	Seamstress	1
	Koranic Schoolgirl	7		

A comparison of the Census data with the Clinical data shows that the two populations have similar attributes and it is fair to say that the two samples are comparable in the most relevant respects.

### 7.3. Clinical Assessment.

During the interview part of the examination when civil data was being taken down, the patient was observed and it was possible to make notes on the schedule about obvious conditions. The items listed on the schedule were all noted and the replies to the questions on disease,

fertility and survival were taken down. Like all clinical examinations one is looking for what one can find and observation must not be exclusively confined to the clinical features listed. It should be stressed that this study is based on comparisons of indices of physical signs, symptoms and conditions and that assessments are made with this end in mind.

(a). Nutrition.

An assessment of the nutritional status of the person examined was based on physical signs exhibited by the hair, tongue, lips, bones and skin. Other organs such as the eyes and gums also undergo pathological changes with visible physical signs but for the purposes of this survey changes in these organs were excluded in assessing nutritional status. As mentioned in the preceding paragraph, health status is being assessed so that definite physical signs or symptoms must be observed which are clear and not equivocal. This undoubtedly means that some borderline cases of nutritional defect are not included so that it is probably that there was a tendency to underestimate these cases.

Signs of nutritional defect leave scars and deformities on the lips, the angles of the mouth, the skin, and the bones, and it is often very difficult to determine if the person is suffering from malnutrition at the time of the

examination, or has suffered in the past. If the physical signs were present the assessment of nutritional defect was made so that persons who have or who have had a nutritional defect were included.

"Hair". Fine hair was considered to be within the range of normal and only reddish and discoloured hair was considered to be hypochromotrichia. The practice of putting palm oil on the hair for the treatment of head lice tinges the hair with a reddish coloration which has to be distinguished from hypochromotrichia, which is a sign of protein malnutrition.

"Tongue". Deviations from the normal tongue were recognised as glossitis, fissured and geographical.

Glossitis was diagnosed when the tongue was smooth, depapillated and purplish raw red in colour. At an early stage this papillae may be granular and enlarged. This is due to a deficiency of the vitamin B<sub>2</sub> complex including riboflavin.

Fissuring of the tongue is common in Africans but as there is no definite evidence that this is of pathological significance, its presence was recorded but no deductions were made. Fissuring is considered by some authorities to be congenital, but Nicholls, Sinclair and Jelliffe (1961) consider it to be an end result of long continued riboflavin deficiency.

Geographical tongue is rare and is seen when there is an area of circinate erythema of the tongue, the red eroded area standing out like a map in relief, with broad white circular outlines. There may be patchy denuding of the epithelium. It is a form of glossitis.

"Lips". Cheilosis and angular stomatitis are common findings.

Cheilosis a condition of raw, reddish, sore lips can result from sensitization to certain fruit rinds such as cashew nuts and mangoes or from vitamin deficiency, especially ariboflavinosis when it is accompanied by a general reddening of the buccal mucosa.

Angular stomatitis presents as soreness, fissuring and painful crusting at the angles of the mouth and may have a variable aetiology. Sometimes the lesions appear sodden and white. Irritant foods, dry winds and sun may aggravate but a riboflavin deficiency is usually the underlying cause.

Both these conditions leave scars on the mouth and the presence of these scars was taken as indicating the presence of the conditions.

"Bones". Bossed skull, beaded ribs and bow legs or other deformity of the limbs are signs of rickets, due to deficiency of the D vitamins and need no further description. Some bossing of the skull may be marked in sickle cell anaemia.

"Skin".

Xerosis (Xeroderma). This is a condition of dry rough skin with fine scalliness which is not specific but occurs in all states of under-nutrition and malnutrition, especially those due to a deficiency of protein or vitamins A or C. This was the only condition of the skin used to indicate the presence of malnutrition as the other skin signs seemed more equivocal.

Depigmentation. This was seen on many occasions. The depigmentation may be almost absolute and patchy at the front of the legs due to old yaws, leucomelanoderma. Vitiligo is seen, and also depigmentation due to fungus infections and leprosy. Onchocercal depigmentation superficially resembles that due to the trepanematoses (Browne, 1960) and is usually seen in the pretibial region. It is usually accompanied by onchodermatitis.

Loss of Elasticity. This occurs in older persons as a normal process. It is commoner in Africans than in Europeans, the former showing the effect of constant exposure to water, wind, sun and dust over a long period of time.

Follicular Hyperkeratosis (Phrynoderma, Toad Skin).

In a variety of malnutritional states the pilosebaceous glands are blocked by plugs of abnormal keratin. The glands enlarge and protrude as dark follicles above the surface of the skin. Lack of Vitamin A, vitamin C and protein are contributing causes. Its localisation



is related to exposure and trauma.

Lichenified. Lichenification of the skin occurs when there has been chronic irritation. The skin is thickened so that lozenge-shaped areas between the normal creases of the skin stand up as flat-topped papules. Lichenified skin itches, which is constantly rubbed to relieve irritation, so the vicious circle is complete. This condition is frequently seen in Africans on the anterior surface of the ankles and is caused, in part, by exposure to water, wind, sun and dust. The rural African engaged in farming can be distinguished from better clothed, more protected Africans brought up in towns by this feature.

The lichenification may be a part of the skin changes of onchocerciasis known as onchodermatitis with whitening of the roughened scratched surface. The epithet "lizard skin" is appropriate.

(b). Eyes.

The examination of the eyes was carried out with a hand lens (corneal loupe) and an electric torch.

I had noted lenticula opacities during my work in Lunsar and their presence was noted on the schedule. The opacities do not exist in infants but increase in frequency with years of age, becoming almost universal in the older age groups. The opacity is uniform and faint at first but in older persons it becomes milky and then greenish in colour. This does not appear to cause

any disability and it does not prevent ophthalmoscopic examination of the retina. It seems most likely that one is observing a normal phenomenon. The condition is indicated as "Uniform opacities" in the text. Apart from common conditions such as conjunctivitis, corneal ulceration and scarring and pterygium one also observes the pathological eye changes of onchocerciasis.

The principal lesions are:-

Conjunctivitis and limbitis.

Punctate Keratitis - most frequently encountered, which may be followed by pannus.

Iridocyclitis - the chief cause of blindness.

Choroido-retinitis and optic atrophy.

(c). Teeth.

The teeth were examined with an electric torch and a spatula so that caries lesions requiring a probe for diagnosis were missed. Only obvious caries was recorded as were missing teeth. Caries frequently occurred in incisor teeth. Tartar was frequently very thick and on occasions fused one tooth with another. The Decayed-Missing-Filling Rate (DMF) was calculated from the caries and missing rates. On no occasion in the villages was any case of conservative dental care seen, but one person in Lunsar had a prosthesis.

(d) Gums.

As for the teeth, the gums were examined with an electric torch and a spatula.

Gingivitis was very common, the whole of the gums being raw, red and swollen, sometimes with exudate. It is difficult to distinguish between a gingivitis caused by malnutrition and that caused by Vincent's organisms. The gums are swollen, tender and bleed easily. The two conditions may easily occur together.

In scurvy the interdental papillae of the gums enlarge as purple buds and bleed easily.

Gums frequently exhibit natural pigmentation in Africans. Artificial pigmentation of the front surface of the gums by tattooing with charcoal, is also practised by some females. This is done for personal adornment.

(e) Ulcers.

The precise aetiology of tropical ulcers is unknown but chronic debilitating disease, such as malaria and ancylostomiasis may be contributing factors.

Any constant connection with malnutrition has not yet been established. But the prevalence of indolent ulcers among malnourished labourers, and ill-fed prisoners of war, leaves little doubt that defective diets may predispose to ulcers and delay healing. Almost all ulcers follow some small trauma, usually to the skin of the

lower leg. Contact with earth, dust, water and flies and organisms of the mouth such as Vincents' organisms, may play a part. Secondary infection of this initial lesion occurs but is very mixed, streptococci and staphylococci being the commonest although Bacillus proteus, diphtheria and diphtheriods and Candida albicans are often present.

(f.) Scars.

Vaccination. The number of persons with an evident vaccination scar was noted. No attempt was made to find out how long ago vaccination had been performed. Many persons are repeatedly vaccinated when the vaccination teams re-visit the rural areas. The African realise that vaccination does prevent smallpox and accept the procedure willingly.

Other Scars. It is probably true that there is no African living in a rural area, above the age when the child begins to crawl, who has no scars. A note was taken of scarring which indicated the presence of some considerable lesion or lesions in the present or past. Apart from trauma by accident, scarring is created for beauty, "for fancy" or to cure disease such as headache. Keloids of considerable size are sometimes seen.

(g.) Malaria.

A thick blood film was taken from each person, usually from the finger, or great toe in the case of an infant.

This was examined wet for microfilaria and other haemoparasites. It was then dried under cover and later stained by Giemsa's stain, and read in the laboratory. The type of parasite and presence of gametocytes were noted. Refusal to allow blood to be taken was rare. *Acanthocheilonema perstans*, which is of small size, with no sheath and a blunt tail, was the only microfilaria seen in blood.

(h). Haemoglobin.

This was estimated at the same time as the blood film was taken. Tallquist's scale was used.

(i). Onchocerciasis.

For the diagnosis of this condition, a skin snip was taken from most persons to demonstrate microfilaria of *onchocerca volvulus*, and a search for nodules or *onchocercomata* was carried out. The eye and skin observations were discussed under appropriate headings.

The skin snip was taken from all persons above the age of toddlers. Refusal was very rare and the calm way in which it was accepted by all ages was quite striking.

The skin snip was taken from the leg on the outer side, must be below the knee when the subject was in the sitting position. It was mounted in saline, teased out and examined under a cover slip for microfilariae. The choice of the leg as the site for skin snip when one biopsy only is performed follows logically from the ob-

servations of Kershaw, Duke and Budden (1954). The leg should offer the greatest probability of finding microfilariae. The microfilaria of *onchocerca volvulus* has no sheath, the head is swollen and tapering and the tail pointed and crook-like. It is found only in skin and other tissues, not in the blood. It is about 300 microns by 5.8 microns.

In the majority of persons only one skin snip was taken. Undoubtedly higher rates would have been found if more than one biopsy had been performed. In survey work of this kind where the maintenance of co-operation and goodwill is essential from villagers it is also important to balance zeal with consideration of the tolerance and patience of the people if good relationships are to be continued.

In some persons, usually older people, in whom it was considered important to do a second biopsy, none refused who were requested.

*Acanthocheilonema* (*Dipetalonema*) *streptocerca* is the only other microfilaria occurring in the skin and hence likely to be confused with the microfilariae of *Onchocerca volvulus*. It has no sheath, the head is undilated, the broadest part of the body being the middle. The nuclei extend to the tip of the tail unlike those of *onchocerca volvulus*. The organism is smaller, being

180-200 microns by 3-4 microns.

An examination of the subject was made for nodules. This was done in a systematic manner from above downwards - head, thorax, pelvic region and legs. Their site and number was recorded. Nodules are more difficult to feel in muscular and fat persons.

(j). Herniae. Umbilical herniae occur in all ethnic groups but Africans have a comparatively high rate. The opportunity was taken to assess this rate on a statistically sound basis.

The skin type neonatal umbilicus is very common.

The main feature is that for the last 1 to 3 cms. the cord is met by a peritoneum lined tube of skin, and it is the persistence of this, together with a wide underlying umbilical ring in the linea alba which is the basis of the umbilical hernia. It should be regarded as the remnant of a physiological variant of neonatal umbilical structure (Jelliffe, 1952). Healing occurs spontaneously in the majority of persons.

(k). Complaints of Illness.

This was in three parts. The first part was the response to the question in Temne "How are you keeping?". This question was considered to be unbiased. Parents made complaints on behalf of infants. Many persons who made no complaint were found, on examination, to be suffering from disease.

The relationship of the complaint of illness to the actuality of disease is hardly meaningful in this part of Africa. Almost everyone seen in a village had some evidence of pathological processes, a positive blood film, worms, lichenified exoriated skin, or other signs and symptoms, yet many did not complain. Some complained as an afterthought if they had heard someone else complain and receive treatment. So many Africans live with disease that almost all villagers should complain of illness but they do not realise, unless prompted, that they are not well.

Of the complaints made, it became clear that they fall into certain categories and it was possible to link these up with the clinical findings.

The second part of this section was concerned with sight. During the survey in Lunsar it had been found that the estimation of visual acuity with the Snellen's Test Card for Illiterates was a difficult and time consuming process.

In the villages the question was asked "Can you see well?". This is a biased question in favour of a positive response so the replies in the negative are probably quite meaningful. If the reply was negative, the symptoms were elucidated by two supplementary questions:-

"Can you see your friends coming down the village street?"  
A negative reply was considered to indicate myopia.



"Can you see to thread a needle and other small objects?". A negative reply was considered hypermetropia, presbyopia or astigmatism.

If visual acuity was low it was tested by asking the subject to count fingers at 2 and 3 metres. In illiterate communities the ability to count fingers up to and including three metres approximates to a visual acuity of 3/60. This level is the definition of economic blindness. This standard was suggested by Budden (1956) and endorsed by the World Health Organisation Conference on Onchocerciasis in 1954.

The third part of this section was applied to males only above the age of puberty. It had been found in Lunsar that gonorrhoea was a common complaint and it was considered that its frequency in the rural population could be elucidated by questioning.

The question was "Have you had venereal disease"? As syphilis is a rare condition because of the cross immunity given by yaws, the usual complaint of venereal disease would be gonorrhoea.

This is borne out by official statistics. In the Report on Medical and Health Services for 1958, the rank order for "Return of Patients treated at Government Hospitals" was (1). Malaria (all forms), (2). Accidents, Poisonings and Violence, (3). Chronic ulcer of skin

(including tropical ulcer), (4). Gonococcal infections.

The question was asked in private because although many Africans discussed this condition openly some felt that it was a cause for reticence.

Persons who were suffering from gonorrhoea at the time of questioning or who had suffered in the past were included.

Females were not questioned about this because the condition is not such a distinct entity in the female.

#### l. Current Illness.

In addition to the questions the observed current illness was noted.

#### m. Fertility and Survival Data.

The questions listed under this heading on the schedule were put to all females of 15 years and over.

It was my practice to ask about the number of children born alive (no.1) and follows with "the number alive at this time". (no. 9) with their ages. Then followed the number of children who died and their ages at death (no. 6) and the other parts of the schedule were filled in and checked against each other.

In the survey the following terms were used:-

"One Pregnancy only" - a pregnancy completed or aborted.

"Non-Fertile" - A woman who has never been pregnant.

Getting fertility and survival data was sometimes slow

hard work, but on the whole the obstetric histories were given in a clear manner. Frequently older women did not know how many children they had had and they had to be reminded by their relatives and neighbours who filled in the mosaic of the family structure. This also applied to the ages at death. On the other hand, some women give precise details, the ages of their children calculated to days. There is no reason why such spontaneous precision should be doubted.

Generally the obstetric histories seemed to be clearer in the villages than they were in Lunsar. This may be because the people are traditionalists and using to discussing family histories. This important part of the schedule frequently took a long time to complete, but with patience, a reasonably accurate account was forthcoming.

#### 7.4. Clinical Data, Lunsar. Commentary.

The clinical material was extracted from the schedules and grouped as morbidity, fertility and survival, and physiological data. The latter was collected as part of the baseline data for Lunsar, although it was not used for comparison for similar data from the villages.

##### 7.4.1. Morbidity.

The clinical data for Lunsar is set out in Tables 14, 15, 16, 17, 18 and 19.

TABLE 14

## CLINICAL DATA, LUN SAR

MALES

		PARASITAEMIA				ONCHOCERCIASIS				DENTITION			EYES		HATR	LIPS			TONGUE				BONES			NUTRITION				ULCERS				SKIN			
AGE	N	Blood Film Taken	Plasmodium Falciparum Positive	Gemotocytes Present	Acantho-chellonema Perstans	Skin snip Taken	mf. o. Volvulus Present	Onchocercerooma - ta Present	Onchocerciasis Positive	Caries	Missing	D.M.F.	Gingivitis	Uniform Opacities Present	Blind	Hypochrome - trieta Present	Normal	Cheilosis	Angular Stomatitis	Normal	Glossitis	Fissured	Geographical	Normal	Bossed Skull	Beaded Ribs	Row Legs	Nutritional Deficiency Present	Complains of Illness	Ulcers Present	Vaccination Present	Umbilical Hernia Present	Lichenified	Discoloured	Loss of Elasticity	Xerosis	
Under 1	8	6	6	-	-	-	-	-	-	-	-	-	-	-	-	8	-	-	8	-	-	-	8	-	-	-	-	3	-	-	8	-	-	-	-		
1 - 4	16	15	15	2	-	10	-	-	-	4	-	4	1	-	-	1	15	1	15	-	-	-	14	2	1	-	6	12	-	9	9	-	-	-	2		
5 - 9	26	26	23	2	-	26	1	3	3	13	1	14	7	4	-	2	24	-	2	26	-	-	25	-	1	-	5	6	3	22	18	1	-	-	2		
10 - 14	19	19	15	-	-	19	3	2	4	11	-	11	5	6	-	-	18	-	1	18	-	-	1	19	-	-	2	5	1	19	9	1	1	1	1		
15 - 19	14	14	11	-	1	14	10	3	11	4	1	4	9	9	-	-	14	-	-	13	-	1	14	-	-	-	2	10	2	11	6	-	1	-	2		
20 - 24	14	14	9	1	-	14	6	8	6	12	5	12	7	8	-	-	13	-	1	11	-	3	14	-	-	-	2	8	1	11	6	-	-	-	1		
25 - 29	26	26	25	2	-	26	19	20	21	15	6	15	17	18	-	-	25	1	-	24	-	2	25	1	-	-	4	22	2	24	14	1	2	-	2		
30 - 34	16	15	13	1	1	16	10	12	14	12	5	12	10	11	-	-	15	-	-	13	-	3	16	-	-	-	3	13	1	15	4	1	2	2	2		
35 - 39	20	20	18	1	3	20	15	17	17	18	5	18	14	18	-	-	20	-	-	14	-	6	20	-	-	-	2	14	-	19	5	2	2	-	2		
40 - 44	10	10	7	1	-	10	7	8	8	9	3	9	6	7	-	-	10	-	-	8	-	2	10	-	-	-	1	5	-	9	1	1	3	2	1		
45 - 49	10	10	9	-	-	10	6	7	8	8	8	10	8	8	-	-	9	-	1	9	-	1	10	-	-	-	1	8	-	10	3	-	2	1	-		
50 - 54	1	1	-	-	-	1	1	1	1	1	1	1	-	-	-	-	1	-	-	1	-	-	1	-	-	-	-	-	-	1	-	-	-	-			
55 - 59	4	4	2	-	-	4	3	3	3	4	2	4	3	4	1	-	4	-	-	4	-	-	4	-	-	-	-	3	1	4	-	1	1	1	-		
60 - 64	3	3	2	-	-	3	3	3	3	2	2	2	2	3	-	-	3	-	-	1	1	1	3	-	-	-	1	2	-	3	1	-	1	1	-		
65 - 69	2	2	1	-	-	2	2	1	2	1	1	2	2	2	1	-	2	-	-	2	-	-	2	-	-	-	-	2	-	1	-	-	-	0	-		
70 - 74	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
75 Plus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Total	189	185	156	10	5	175	86	93	103	114	40	118	91	98	2	3	182	1	6	168	1	19	1	185	3	2	-	29	113	11	158	84	8	15	8	15	
Percent		97.9	84.3	6.4	2.7	92.6	49.1	49.2	54.5	60.3	21.2	62.4	48.1	51.9	1.1	1.6	96.3	0.5	3.2	88.9	0.5	10.1	0.5	97.9	1.6	1.1	-	15.3	59.8	5.8	83.6	44.4	4.2	7.9	4.2	7.9	

TABLE 15  
CLINICAL DATA, LUNSAR

FEMALES

AGE IN YEARS	N	PARASITAEMIA				ONCHOCERCIASIS				DENTITION				EYES		HAIR		LIPS			TONGUE			BONES				ILLNESS				SKIN				
		Blood Film Taken	Plasmodium Falciparum Positive	Gametocytes Present	Acanthocheilonema Perstans	Skin snip taken	mf. o. Volvulus Present	Onchocercosoma Present	Onchocerciasis Positive	Caries	Missing	D.M.F.	Gingivitis	Uniform Opacities Present	Blind	Hypochromotrichia Present	Normal	Cheliosis	Angular Stomatitis	Normal	Glossitis	Fissured	Geographical	Normal	Bossered Skull	Beaded Ribs	Row Teeth	Nutritional Deficiency Present	Complains of Illness	Ulcers Present	Vaccination Present	Umbilical Hernia Present	Lichenified	Deformed	Loss of Elasticity	Xerosis
Under 1	6	6	5	1	-	-	-	-	-	-	-	-	-	-	6	-	-	6	-	-	-	6	-	-	-	-	1	-	-	3	-	-	-	-		
1 - 4	22	20	19	3	12	-	-	-	3	-	3	4	1	-	7	20	2	22	-	-	-	20	2	1	1	9	16	-	12	19	-	-	-	3		
5 - 9	29	28	22	-	28	3	5	5	14	-	14	4	2	-	7	25	2	2	28	1	-	-	28	1	1	10	16	1	24	18	1	-	1	1		
10 - 14	13	13	11	-	12	1	2	2	9	1	9	2	3	-	3	9	1	3	13	-	-	-	12	-	1	7	5	4	11	6	1	1	-	-		
15 - 19	22	21	16	2	22	4	7	7	14	-	14	2	8	-	-	20	-	2	20	-	2	-	21	1	-	3	12	2	22	11	-	2	-	-		
20 - 24	17	16	12	1	17	7	9	9	9	3	10	4	5	-	-	17	-	-	15	-	2	-	16	1	-	1	11	1	17	8	2	1	-	-		
25 - 29	25	25	13	-	25	10	14	15	15	6	15	7	9	-	-	24	-	1	23	-	2	-	25	-	-	1	15	1	24	11	-	2	-	1		
30 - 34	13	13	7	1	13	5	11	11	11	6	11	2	7	-	-	11	1	1	10	-	3	-	13	-	-	1	10	1	12	3	1	-	-	1		
35 - 39	19	17	11	-	18	7	12	12	13	7	13	8	12	-	-	18	-	-	15	-	3	-	18	-	-	-	12	-	17	6	1	1	-	-		
40 - 44	6	6	5	-	6	5	6	6	5	4	5	2	5	1	-	6	-	-	6	-	-	-	6	-	-	-	6	-	6	1	-	1	-	-		
45 - 49	9	8	5	-	9	4	6	7	9	5	9	7	3	-	-	6	-	3	7	-	2	-	9	-	-	3	9	-	9	2	-	-	-	-		
50 - 54	2	2	-	-	2	2	2	2	2	2	2	2	2	-	-	2	-	-	2	-	-	-	2	-	-	-	2	-	2	-	-	-	1	-		
55 - 59	3	3	1	-	3	1	3	3	2	1	2	2	3	-	-	3	-	-	2	-	1	-	3	-	-	-	3	-	3	-	-	-	-	-		
60 - 64	3	2	2	-	3	2	3	3	2	2	2	-	3	-	-	3	-	-	3	-	-	-	3	-	-	-	3	-	3	2	-	-	-	-		
65 - 69	3	2	2	-	3	-	3	3	2	2	2	2	3	1	-	3	-	-	3	-	-	-	3	-	-	-	3	-	2	-	-	-	1	-		
70 - 74	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
75 Plus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Total	191	182	131	8	4	173	51	83	85	110	39	111	48	66	2	17	173	4	14	175	1	15	-	185	5	3	1	35	124	10	164	90	6	8	3	6
Percent		95.3	72.0	6.1	2.2	90.6	29.5	43.5	44.5	57.6	20.4	58.1	25.1	34.6	1.0	8.9	90.6	2.1	7.3	91.6	0.5	7.9	-	96.9	2.6	1.6	0.5	18.3	64.9	5.2	85.9	47.1	3.1	4.2	1.6	3.1

TABLE 16  
CLINICAL DATA, LUN SAR

TOTAL				PARASITAEMIA										ONCHOCERCIASIS				DENTITION				EYES		HAIR		LIPS			TONGUE			BONES				ILLNESS				ULCERS				SKIN			
AGE IN YEARS	N			Blood Film Taken	Plasmodium Falciparum	Gametocytes Present	Acantho - Cheilonema Perstars	Skin Snip Taken	mf. o. Volvulus Present	Onchocercaria P. Present	Onchocerciasis Positive	Caries	Missing	D.M.F.	Gingivitis	Uniform Onocytites Present	Blind	Hypochromic - Trichia Present	Normal	Cheliosis	Angular Stomatitis	Normal	Glossitis	Fissured	Geographical	Normal	Bossed Skull	Beaded Ribs	Bow Legs	Nutritional Deficiency Present	Complains of Illness	Ulcers Present	Vaccination Present	Umbilical Hernia Present	Lichenified	Deformed	Loss of Elasticity	Xerosis									
	M	F	T																																												
Under 1	8	6	14	12	11	1	-	-	-	-	-	-	-	-	-	-	-	-	14	-	-	14	-	-	-	14	-	-	-	4	-	-	11	-	-	-	-										
1 - 4	16	22	38	35	34	5	-	22	-	-	-	7	-	7	5	1	-	8	35	-	3	38	-	4	-	34	4	2	1	15	28	-	21	28	-	-	-	5									
5 - 9	26	29	55	54	45	2	-	54	4	8	8	27	1	28	11	6	-	9	49	2	4	54	1	-	-	53	1	2	-	15	22	4	46	36	2	-	1	3									
10 - 14	19	13	32	32	26	-	-	31	4	4	6	20	1	20	7	9	-	3	27	1	4	31	-	-	1	31	-	1	-	9	10	5	30	15	2	2	1	1									
15 - 19	14	22	36	35	27	2	3	36	14	15	18	18	1	18	11	16	-	-	34	-	2	33	-	3	-	35	1	-	-	5	22	4	33	17	-	3	-	2									
20 - 24	14	17	31	30	21	2	-	31	13	17	17	21	8	22	11	13	-	-	30	-	1	26	-	5	-	30	1	-	-	3	19	2	26	14	2	1	-	1									
25 - 29	26	25	51	51	38	2	2	51	29	34	36	30	12	30	24	27	-	-	49	1	1	47	-	4	5	50	1	-	-	5	37	3	48	25	1	4	-	3									
30 - 34	16	13	29	28	20	2	3	29	15	23	25	23	11	23	12	18	-	-	27	1	1	23	-	6	-	29	-	-	-	4	23	2	27	7	2	2	2	3									
35 - 39	20	18	38	37	29	1	-	38	22	29	29	31	12	31	22	30	-	-	38	-	-	29	-	9	-	38	-	-	-	2	26	-	36	11	3	3	-	2									
40 - 44	10	16	16	16	12	1	-	16	12	14	14	14	7	14	8	12	1	-	16	-	-	14	-	2	-	16	-	-	-	1	11	-	15	2	1	4	2	1									
45 - 49	10	9	19	18	14	-	-	19	10	13	15	17	13	19	15	11	-	-	15	-	4	16	-	3	-	19	-	-	-	4	17	-	19	5	-	2	1	-									
50 - 54	1	2	3	3	-	-	-	3	3	3	3	3	3	3	2	2	-	-	3	-	-	3	-	-	-	3	-	-	-	2	-	3	-	-	-	1	-										
55 - 59	4	3	7	7	3	-	-	7	4	6	6	6	3	6	5	7	1	-	7	-	-	6	-	1	-	7	-	-	-	6	1	7	-	1	1	1	-										
60 - 64	3	3	6	5	4	-	1	6	5	6	6	4	4	4	2	6	-	-	6	-	-	4	1	1	-	6	-	-	-	1	5	-	6	3	-	1	1	-									
65 - 69	2	3	5	4	3	-	-	5	2	4	5	3	3	4	4	5	2	-	5	-	-	5	-	-	-	5	-	-	-	5	-	3	-	-	-	1	-										
70 - 74	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-										
75 plus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-										
TOTAL	189	191	380	367	287	18	9	348	137	176	188	224	79	129	139	163	4	20	355	5	20	348	2	34	1	376	8	5	1	64	237	21	322	174	14	23	11	21									
PERCENT	49.7	50.3	100	96.6	78.2	6.3	2.5	91.6	39.4	46.3	49.5	58.9	20.8	6.3	36.6	42.9	1.1	5.3	93.4	1.3	5.3	90.3	0.5	8.9	0.3	97.4	2.1	1.3	0.3	16.8	62.4	5.5	84.7	45.8	3.7	6.1	2.9	5.5									

The rates for disease are higher in most cases for males with the exception of nutritional defects.

Each condition for which data was collected will now be discussed.

### Malaria.

Thick blood films were only used in the survey and Plasmodium falciparum was the only malaria parasite recognised.

Blood films for 96.6% of the sample were examined. 84.3% of males and 72.0% of females had Plasmodium falciparum in their blood, with gametocyte rates of 6.4% and 6.1% respectively.

The infant parasite rate, (under 1) was 91.6% for both sexes.

Spleen examination was made with the subject standing or sitting in the arms of parents in the case of infants. Hackett's method of recording spleen enlargement was used.

The spleen rates at 2 - 9 years, were 97.0% for males and 91% for females. Adult spleen rates were 18.1% for males and 53.6% for females.

Thus the malaria may be stated to be between hyperendemic and holoendemic in type.

The males would appear to acquire immunity at a faster rate than the females. The adult males have a higher

tolerance than the females.

This is understandable in the Lunsar setting. The young males wear less clothes and are more exposed to the bites of anthropods. Small boys, almost nude, are put on platforms in the middle of rice fields to chase away the birds with slings. They stay there all through the day and are bitten frequently by mosquitoes, Simulium and other anthropods. It should be pointed out that the activity of *A.gambiae* starts between 18.00 and 20.00 hours, increases during the night with a peak one or two hours before sunrise, and then decreases rapidly. The young girls are often traders, carrying a tray on their heads through the streets of the town. This lessened exposure to anthropods among females would seem to be reflected in splenomegaly records.

Acanthocheilonema perstans.

This non-pathogenic microfilaria was seen in 2.5% of blood films.

Onchocerciasis.

The annual report on Medical and Health Service for 1958 gives only nine cases of this disease diagnosed in hospital so that the high rates found in Lunsar came as something of a surprise. Blacklock's (1926) original paper on the disease in Sierra Leone states that infection with *O. volvulus* is common in the Kono District, South-



Table 17

MALARIA

LUN SAR

Splenomegaly

Both sexes N = 375

Class of Spleen	AGE GROUP				
	0 - 1	2 - 4	5 - 9	10-14	Adults
0	6	2	3	4	151
1	3	4	8	10	59
2	13	4	18	13	20
3	2	18	24	5	7
4	-	-	1	-	-
5	-	-	-	-	-

SPLEEN RATES : 2 - 9 years = 93.9% Adult = 35%

Males N = 184

Class of Spleen	AGE GROUP				
	0 - 1	2 - 4	5 - 9	10-14	Adults
0	3	1	-	4	95
1	1	2	4	8	19
2	8	1	9	6	2
3	1	7	12	1	-
4	-	-	-	-	-
5	-	-	-	-	-

SPLEEN RATES : 2 - 9 years = 97% Adult = 18%

Females N = 191

Class of Spleen	AGE GROUP				
	0 - 1	2 - 4	5 - 9	10-14	Adults
0	3	1	3	-	56
1	2	2	4	2	40
2	5	3	9	7	18
3	1	11	12	4	7
4	-	-	1	-	-
5	-	-	-	-	-

SPLEEN RATES : 2 - 9 years = 91% Adult = 5.3%

Eastern Province and that larvae of the parasite were found in the skin of 45% of persons (males) examined systematically. The skin snip rate in Lunsar was 49.1% in males and 29.5% in females. This rate is a minimal figure as only in exceptional cases was a second skin snip performed. It is highly likely that were more than one skin snip performed a much higher rate would be demonstrated. Skin snips were taken in 92.6% of males and 90.6% of females.

The correspondence between skin snip positive cases and nodules positive cases is fairly close. 49.2% of males, and 43.5% of females were positive for onchocercomata.

The skin snip positive rate for males is the same as the nodules positive rate. In females more nodules positive cases are seen than skin snip positive cases.

The general rate for onchocerciasis positive cases is higher for males 54.5%, than for females, 44.5%, the mean rate for both sexes being 49.5%.

The youngest cases of onchocerciasis in Lunsar were one male and one female, both aged 6 years, both with positive skin snips and nodules present.

Tables 18 and 19 show the frequency of site of onchocercomata and the number of nodules per person. The iliac crests are the commonest sites and 54.5% of persons have only one nodule. The rates are similar to Browne's (1961) figures from the Congo where 91.7% of

onchocercomata were localised in the region of the pelvic girdle. Infections with 2 or 3 nodules are common.

There were only 2 persons with nodules over the ribs and none with nodules on the head. 2 males had nodules round the knees. As was noted by Blacklock (1926) some persons complained of pain in the nodules.

6 cases of onchocercal dermatitis were seen, all in males. Onchocercal dermatitis is an aggravated form of lichenification and the demarcation line is difficult to judge.

Impaired vision was seen in some cases. An attempt was made to measure this using Snellen's Test card for illiterates. The Africans tested did not appear to understand that the direction in which the test figure was pointing was important and as a result the testing of vision had to be abandoned. There is an interesting field for a psychological investigation into African concepts of space and time, which Littlejohn is investigating.

Elephantiasis was not seen in the clinical sample although a case, associated with onchocerciasis was seen in the clinical practice.

Hydrocele was seen in two cases. One male of 29 years and the other of 48, both had onchocerciasis.

The infection is thus widespread but the site and frequency of the nodules and the low blindness rate

Lunsar

Table 18

Frequency of site of Onchocercosmata, Lunsar.

Site of Onchocercosmata	Males	Females	Total	%
Sacral region	22	13	35	16.4
Great Frochanters	26	12	38	17.8
Iliac Crests	68	68	136	63.8
Thorax	1	1	2	0.9
Head	-	-	-	-
Legs	2	-	2	0.9
	119	94	213	99.8

Table 19

Number of Onchocercosmata per Person, Lunsar

Number of Onchocercosmata	Males	Females	Total	%
1	45	51	96	54.5
2	19	18	37	21.0
3	16	5	21	11.3
4	4	5	9	5.1
5	2	1	2	1.7
6	1	2	3	1.7
7	2	1	3	1.7
8	2		2	1.1
9	1		1	0.5
10+	1		1	0.5
	93	83	176	99.1

indicate that the problem of onchocerciasis in this region is not so serious at the present time as it is in other parts of West Africa. Lunsar is situated two miles away from the nearest breeding place of *Simulium damnosum*, the Rokel River.

11 cases of onchocerciasis were treated with diethylcarbamazine (Banocide B.W. & C.) 100 mg. daily. In all cases microfilariae were cleared from the skin in about ten days. In 2 cases, the itching caused by the death of the organisms was so great that treatment had to be discontinued.

#### Dentition.

The caries rate and the D.M.F. (Decayed-Missing-Filled) rates are high. The caries rate is 60.3% for males and 57.6% for females, the corresponding D.M.F. rates being 62.4% and 58.1% respectively. Mansbridge (1959) has reviewed sex differences in the prevalence of dental caries and showed that dental caries of the permanent teeth was found to be more prevalent in females than in males, hence the finding for Lunsar may be considered unusual. Only one person, a male, aged 68 had a prosthesis, a partial upper and lower denture. No other person showed signs of conservative dentistry.

Some persons had teeth which had been ground down considerably, and caries appeared to be absent in these cases.

Nutrition is not a determining factor in the production of dental caries but is predisposing. It is one factor among many. It has an influence on tooth formation and maturation. The nutritional influence on the erupted mature teeth is by way of the saliva.

As can be seen from the list of foods available in Lunsar market, and taking note of the sort of foods available from traders it can be stated that almost all of the daily intake of food comes from home grown resources. Canned foods, e.g., fish, meat, puree, are used in the preparation of the sauce (asaka) to go with the rice.

In a leading article on the prevention of dental caries (1961) the "British Medical Journal" states "There is little doubt that caries can be prevented to a large extent by the elimination of our so called 'civilised diet'". In no sense of the words can the diet of the Africans in the Lunsar region be said to consist largely of refined foods, yet the D.M.F. rates are high.

Toothbrushes or chewing sticks were used by some persons in Lunsar but no assessment of the value of this procedure could be made.

#### Gingivitis.

This is a common condition, being seen in 48.1% of males and 25.1% of females.

Gingivitis is an inflammatory form of periodontal disease which causes damage to the supporting structures

of the teeth and such damage in early adult life is irreparable, whilst in middle life it destroys a large part of the natural dentition and deprives many people of their teeth long before old age.

In general, local, rather than systematic factors appear to be responsible for initiating periodontal disease. However, since the formation and maintenance of collagen are dependent on an adequate intake of vitamin C any deficiency of this vitamin will favour inflammatory destruction of the collagen fibres, so that the deepening of a pre-existing periodontal pocket will take place more rapidly than usual.

Other vitamin deficiencies, hormonal disturbances, and some protein deficiencies and blood dyscrasias may also influence the course of periodontal disease, but their effects are less spectacular than those of lack of vitamin C.

The most important single aetiological factor is the deposition of the bacterial plaque. This consists mainly of living micro-organisms, and although these are considered to be non-pathogenic they are present in a high concentration.

As the organisms multiply, the plaque grows below the gingival margin towards the apex of the tooth and is thus constantly in contact with a large area of soft tissue.

The irritation produced leads to the formation of a pathological pocket in the gingival crevice. The inflammation is accompanied by progressive destruction of the periodontal fibres and resorption of the alveolar wall. This loss of supporting structure is a permanent one and may progress to the point where the tooth falls out.

The deeper layers of the bacterial plaque often degenerate and become calcified to form calculus or tartar. Supragingival calculus, if excessive causes gingival recession and eventual loss of the tooth. Occasionally teeth were seen fused together by calculus.

The periodontium may also be subject to degenerative changes or be the site of neoplastic processes.

#### Eyes.

Uniform opacities were seen in 51.9% of males and 34.6% of females. Their significance is not known.

#### Blindness.

1.1% of males and 1.0% of females were blind, all were over 40 years.

One male aged 58, was blind in the left eye. There was a large corneal opacity probably not due to onchocerciasis. He had neither onchocercomata nor a positive skin snip. He had, however, highly lichenified skin on the feet and legs which might be onchocercal in origin.



A male, aged 68, was blind in the right eye. There was complete destruction of the iris and lens of probably onchocercal aetiology. He had nodules and positive skin snip.

A female, aged 40, was blind in the left eye due to pannus, probably onchocercal. She had positive skin snip and nodules.

A female, aged 68, was blind in both eyes, with pannus. She had nodules but was negative on skin biopsy. The blindness was probably of onchocercal origin.

It should be pointed out that it is not enough to establish that the blind subject is suffering from onchocerciasis to prove the cause of blindness.

Not being an ophthalmologist I do not feel confident in ascribing these lesions to one cause or another. To survey the area for onchocerciasis it would be necessary for ophthalmologists to identify all the various types of ocular lesion found among the population and to indicate their incidence among infected and non-infected persons. Such a survey is outside the scope of this research.

During the clinical examination the eyes were examined with a hand lens. In many cases the lens appeared to have a milky appearance. This occurred at 51.8% for males, 34.5% for females and 42.8% for both sexes. It appeared to correlate with the skin snip rate and I thought it might be an early stage of onchocercal involvement.

Professor G.I. Scott in a personal communication suggested that it is much more likely to be a nutritional phenomenon.

In view of its almost universal presence in the older age groups it seems likely that a normal ageing process was being observed.

Pterygium was seen in 15 males and 11 females. All cases were over 20 years old.

Visual acuity was not assessed except by the ability to count fingers because of the difficulties encountered with Snellen's Test Card for illiterates.

All persons were questioned about their vision by asking them "Can you see clearly?"

Many persons complained of abnormal sight and this was recorded in the villages. The commonest complaints were of poor distance vision and seeing "black objects" in front of the eyes, almost certainly associated with the presence of microfilaria of *O. volvulus* in the anterior chamber of the eye. In the villages, "Abnormal vision" and "Blindness" are recorded separately. "Blindness" is not included in the category "Abnormal vision".

#### Nutrition.

The Tables 14, 15 and 16 show the prevalence of signs of nutritional defects in the skin, the mouth and the bones.

The presence of one or more of the following signs of

defective nutrition was taken to indicate "Nutritional Defect".

1. Hypochromotrichia.
2. Cheilosis.
3. Angular stomatitis.
4. Glossitis.
5. Bossed skull.
6. Beaded ribs.
7. Bow legs.
8. Xerosis and Follicular Keratosis.

15.3% of males and 18.3% of females suffered from nutritional deficiency as defined above.

Fissured tongue was not seen in persons under 4 years of age, either in Lunsar or in the villages. It is difficult to see how it could be congenital. One female infant aged 3 had Kwashiorkor. It should be remembered that indices for comparison are being established and not nutritional deficiency as a clinical state otherwise a much higher rate would be expected.

The question of diet was not investigated but the foods available in Lunsar market were listed and show a wide variety (See Appendix). Much of the rice in Lunsar is parboiled and this is a high quality food. It was not possible to find out when this was first prepared. Apart from its better nutritive value, parboiled rice has a less fragile grain than white rice and is more easily stored.

Ulcers.

These were seen in 5.8% of males and 5.2% of females.

Vaccination.

The scar of vaccination was present in over 80% of both sexes which is a satisfactory level, although the younger age groups are not represented at such a high level.

Venereal Disease.

Urethral discharge, presumed gonorrhoea was seen in 8 males (4.2% of males).

In the case of Lunsar, in contrast with the villages, a past history of gonorrhoea was not noted.

Umbilical Herniae.

This was seen in 44.4% of males and 47.1% of females. The prevalence is very high in young children and diminishes with age spontaneously.

Other Conditions.

These are listed below. It will be noted that injury, including fractures, ranks high, followed by scabies, epidermophytoses, bronchitis and sepsis.

Some notable absentees were schistosomiasis, pulmonary tuberculosis and trypanosomiasis. It is useful, at this point, to assess their role in the Northern Province of Sierra Leone. The following description comes from material by various authorities.

### Schistosomiasis.

No cases were seen and no histories suggestive of schistosomiasis were taken during the course of the surveys in Lunsar or the villages.

The only traceable case in the region was that of Martha Bobo, a Mende female aged 22 from Moyamba, one of the endemic areas of schistosomiasis. She had lived in Lunsar 2 years and had been a farmer. She had received treatment at the Marampa Mines Health Centre, and was not in the Census or Clinical Samples.

*Schistosoma haematobium* is hyperendemic around streams and swamps in the north-eastern part of Sierra Leone.

*Schistosoma mansoni* has been found in a few towns and villages in south-western Province. It is interesting to note that Blacklock (1929) found *S. haematobium* ova in the urine of 4 persons out of 578 examined in the Northern Province. All four cases originated outside the Province.

The possibility that this disease might spread into the Northern Province in the future must be considered. The snail population is not known but the habits of the people would undoubtedly encourage spread if other factors were favourable.

### Tuberculosis.

One male in Lunsar, and two males and one female in the villages were diagnosed clinically as pulmonary tuberculosis.

Blacklock (1929) found no cases of lung disease due to the tubercle bacillus in his survey of Sierra Leone. He did, however, find several cases which suffered from fever, emaciation, rapid pulse, and respiration with cough and purulent expectoration. The approximate number of persons examined was 2,900.

In 1958 there were 653 males and 311 females treated at Government hospitals (in-patients and out-patients) for pulmonary tuberculosis. In 1958, tuberculosis prevalence surveys were conducted by the World Health Organisation (I am grateful to Dr. F.J.C. Cambournac, Regional Director for Africa, W.H.O. for permission to use this data). One in Freetown, the capital, and the other in the rest of the Colony and the Protectorate. Both surveys were confined to Africans and sampling methods were used. The surveys were designed to obtain estimates of the prevalence of tuberculous infection and of infectious pulmonary tuberculosis in these two populations, and for this purpose a sample of each population, selected at random, was examined by three simple diagnostic methods: a low-dose tuberculin test, miniature chest X-ray examination, and bacteriological examination of sputum specimens.

Holm (1959) referring to prevalence surveys of large samples of the population selected at random, states that 2 - 20 cases per 1,000 adult population is a relatively

Table 19a

Other Conditions seen in Lunsar

	Males	Females	Total
Bronchitis	9	7	16
Congenital Heart	-	1	1
Congenital Winged Scapula	1	-	1
Deafness	1	-	1
Diabetes mellitus	1	-	1
Diarrhoea	1	1	2
Dysentery	2	-	2
Epidermophytosis	10	9	19
Goitre (aged 21)	-	1	1
Hydrocele	2	-	2
Injury	15	9	24
Leprosy	1	-	1
Mentally Defective	-	1	1
Molluscum contagiosum	-	1	1
Otitis media	1	1	2
Scabies	11	12	23
Sepsis	9	4	13
Stomatitis	1	-	1
Talipes equino-varus	-	1	1
Tuberculosis	1	-	1
Worms			
	66	48	114

high prevalence. He also states that when less than 1% of the children are reactors to tuberculin at 14 years of age, then the risk of the contraction by a healthy person of a tuberculous disease is so small that tuberculosis can no longer be considered a public health problem in the community concerned.

In the World Health Organisation surveys, 1,522 persons in Freetown and 2,916 persons in the Colony and Protectorate (Sierra Leone Survey) were examined, corresponding to 1% of the inhabitants of Freetown and 0.2% of the population of the rest of the country.

#### Tuberculin Testing.

The tuberculin test (Mantoux 5 TU) did not effect a clear separation between infected and uninfected because of the presence of a large proportion of intermediate-sized reactions caused by low-grade tuberculin sensitivity. This problem of specific and non-specific kinds of naturally acquired tuberculin sensitivity has been discussed by the W.H.O. Tuberculosis Research Office (1955).

Estimates of the prevalence of tuberculosis infection were computed on the basis of certain assumptions and were given by age. Half the population is infected at the age of 10-14 years in Freetown and at 15-19 years in the rest of the country. The infection-age curve rises very steeply for Freetown and more gradually in the country. A consistently higher prevalence of tuberculous



infection is observed in Freetown as compared to the Sierra Leone survey. The estimated overall prevalence is 63.8% in the Freetown Survey and 58.5% in the Sierra Leone survey.

In comparing these two estimates it should be considered that the mean age of the sample population in the Freetown survey is lower than that of the sample population in the Sierra Leone survey, and the difference between age adjusted estimates would be greater. The observed difference is significant at the 5% level. It is estimated that the prevalence of infection by age in Freetown corresponds to an incidence of infection which is nearly double that in the rest of Sierra Leone.

Analysed by sex, in Freetown the prevalence is generally lower among females than among males except in the age groups 15 - 19 years.

In the Sierra Leone survey it is consistently lower for females in all age groups.

#### X-ray Examination.

4.7% of the persons examined in Freetown and 3.8% of those examined in the rest of the country were found to have lung lesions on X-ray examination. However, when the lesions were broken down by type, the prevalence of infiltrates with or without cavity was almost the same in the two surveys. When analysed by sex, the overall

prevalence was found to be generally higher for males in Freetown, whereas in the country it was almost the same for the two sexes.

#### Bacteriological Examination.

The prevalence of tuberculous disease in the populations examined, based on the combined results of direct microscopy and culture, are estimated to be 0.09% in Freetown and 0.75% in the country. These estimates are, however, encumbered with a high degree of uncertainty because of the small number of specimens and the fact that only a part of them was examined by culture, the actual prevalences were calculated to lie between 0.002% and 2.6% in Freetown and between 0.26% and 1.79% in the country.

The corresponding prevalences based on the results of direct microscopy alone, are estimated to be 0.09% in Freetown and 0.14% in the country, the actual prevalences being calculated to lie between 0.002% - 0.53% and 0.03% - 0.41% respectively.

It is indeed fortunate to have accurate figures for prevalence of tuberculosis in Africa.

For a considerable time there have been opposing views on the prevalence and virulence of tuberculosis in indigencous populations in Africa. This has been due to various factors, among which may be mentioned the masking of the disease by other endemic diseases. It is

common for a sick person in Africa to be suffering from more than one disease.

Statistics of morbidity and mortality have been absent or inexact, and when coming from hospitals have only reflected the activity of the service and not the importance of the disease in the community.

Pulmonary tuberculosis seen in Africans in the European setting has generally had a grave prognosis and this has given rise to the generalisation that the African has little or no resistance to the disease. In Africa the multiple pathology of the patient, e.g., malaria, intestinal parasitism, malnutrition and other conditions, and the reluctance to go for treatment until the end is near have also given a sombre impression of this disease. On the other hand hospital admissions and deaths in some territories in West Africa have been few and this has led others to suppose that Africans have a considerable resistance to the disease. Any racial factor there may be is indeed impossible to separate from environmental and social factors.

Thus two diametrically opposed views have been propagated, but with the extension of careful surveys the picture of tuberculosis in Africa is being pieced together.

From the foregoing it will be seen that there is an increased risk of tuberculosis in Freetown compared with the rest of the country. The present survey did not

investigate any difference there may be between Lunsar and the villages.

Trypanosomiasis.

No cases were seen during the course of the survey.

Hutchinson (1958) has described the epidemiology of human trypanosomiasis in Sierra Leone.

There are two endemic areas of the disease. One area is a broad belt along the Liberian border in the south-east region of the country, and the other area is Sherbro Island off the south-west coast of Sierra Leone.

*Trypanosoma gambiense* is the only species of trypanosoma known to occur in man in West Africa.

Five different species of tsetse have been recorded from Sierra Leone, these being *Glossina palpalis*, *G. longipalpis*, *G. fusca*, *G. nigrofusca* and *G. pallicera*. Only the first three of these are considered to be of economic importance.

*G. palpalis* is the only species of real medical importance. It is found throughout the country but is only numerous along the creeks and by the mouths of rivers in the coastal area, where it feeds in the mangrove belt and breeds in the line of vegetation fringing the dry land.

In the secondary evergreen thicket belt, *G. palpalis* is usually scanty especially in the south where it is found along the main rivers but is frequently absent from

the small side streams which are often choked with dense vegetation. The fly becomes more plentiful in the transition zone between secondary forest and grassland where the forest of thicket bordering the streams provides shelter and patches of adjoining grassland or farmland providing feeding grounds.

In the true savannah country, the fly again becomes scarce as the thin riverine vegetation often affords inadequate protection against the fierce grass fires which occur during the dry season.

Although the climatic conditions at the end of the dry season are moderately severe they are not generally inimical to the survival of *G. palpalis* and concentration of the fly at that season into limited favourable habitats is less marked than in other areas in West Africa.

The long rainy season provides a natural check on the rapid increase of the fly population. Because of the heavy rainfall extensive flooding is liable to occur and with the waterlogging of the ground many of the normal breeding sites of *G. palpalis* are destroyed. The long period of cloud shadow reduces the activity of the surviving fly to a minimum and breeding is greatly diminished.

#### Epidemiology.

Where the rainfall is over 60 inches as in Sierra Leone, and where the number of dry months is not more than

two, conditions of temperature and humidity are such as to permit *G. palpalis* to range freely from its permanent habitats in search of blood meals which are readily available from a variety of different hosts. In these localities the greatest density of *G. palpalis* may be found in the mangrove swamps, bordering inlets, creeks and large rivers. Elsewhere the fly may be scanty in numbers but widely dispersed. These conditions are not conducive to the epidemic spread of sleeping sickness and normally only a very low level of infection is found in such areas, other factors being favourable.

Where extensive deforestation has occurred for farming purposes as in the Northern Province, the secondary forest that results may be inimical to *G. palpalis*, but in some areas this is giving way in turn to a well defined transitional zone between forest and savannah and it is in this zone that man-fly contact is liable to become dangerous.

Human trypanosomiasis is essentially a rural disease, the farmer may come into contact with the tsetse vector anywhere.

Fishermen may run a special risk, man-fly contact is likely to be particularly dangerous during the dry season when the local fly foci are most concentrated in the neighbourhood of the permanent water.

In Sierra Leone the number of men exposed to localised foci of tsetse is very small, and as has been noted, no cases were found in the present survey.

Socio-economic factors are of great importance in relation to the spread of sleeping sickness. Widespread travel and free intercourse between sections of the community are liable to facilitate the dispersal of infected persons so that a reservoir of infection may be introduced into fresh localities.

Thus, where the tsetse vector is already present, such far reaching changes as improved communication, cessation of inter-tribal strife and free social and commercial intercourse are factors influencing the spread of disease.

The effect of density of population on the fly varies with vegetational and climatic zones.

In the central belt of Sierra Leone including parts of the Northern Province, a transitional type of vegetational zone, intermediate between savannah and secondary farm thicket and forest has been created and this type of country may provide adequate man-fly contact if the population is of high density.

Up to the present time epidemics of sleeping sickness have not occurred.

In Sierra Leone it would seem that the vegetational changes continue to be unfavourable to the tsetse vector

in the Northern Province. Infected individuals have been introduced into Sierra Leone from the old endemic focus in the Guinea Republic for many years but no epidemic occurred before 1930. At this time, local conditions had undergone changes to alter this balance. There was near famine in the Kissi-Kono region, labour had congregated and human farming activity had resulted in uninterrupted cover along streams. Open patches of grassland and farmland provided good hunting grounds for the fly. As a result of these changes a serious epidemic developed among the Kissi and Kono tribes which was, however, rapidly controlled.

#### 7.4.2. Physiological Data.

Physiological measurements were made as part of the baseline data for Lunsar. Heights and weights for age and sex, blood pressures, haemoglobin per cent, and urine tests (in males only) were made. The presence or absence of umbilical hernia was also noted.

The numbers in the sample are small but are worthy of some comment.

The data are set out in tables 20, 21 and 22.

#### Height.

It will be noted that up to the age of 5 years, females are taller than males but from then on, males are taller.



The mean height for males 20 years and over is 167 cms. (5 ft. 6 ins.) and for females of the same age group, 156 cms. (5 ft. 1 ins.). These mean heights are less than those for Europeans and Americans, (Geigy, 1956), in the corresponding sex and age groups, but greater than some other peoples, for example, the Marshallese as described by Murai (1954). The mean figures are similar to those for a Gambian village (McGregor, Smith, 1952).

#### Weight.

Persons were weighed clothed but without footwear.

The mean weight for males 20 years and over is 57.18 Kgms. (125.79 lbs) and for females of the same age group, 53.05 Kgms. (116.71 lbs).

These mean weights are less than those for Europeans and Americans in the corresponding sex and age groups, and also less than the figures for Marshallese. The figures are similar to those for Keneba, Gambia.

#### Birth weights.

These have been extracted from the Marampa Mines Health Centre records and are in Table 23. A comparison has been made with mean birth weights from other African territories. The figures from the Lunsar area are similar to those in other parts of Africa. 20.4% of live births were premature judged by the international standard of 2.5 kg. or less.

Platt (1948) suggested that "a record of birth weights

of infants may provide a useful indicator of the state of nutrition of mothers and possibly of the community generally".

There seems little doubt that these low figures are very probably due to maternal malnutrition (Jelliffe, 1955) especially protein lack during the final trimester of pregnancy. Similar low figures have been found in other poorly fed tropical peoples, in Europeans following material privation, for example in the Netherlands shortly after liberation and in Leningrad during the seige. In the U.S.A. Bakwin and Patrick (1944) have shown that negro infants of well nourished mothers in high income groups show no significant variation from normal Caucasian values. It would thus seem logical to apply international standards, such as those for prematurity, to these measurements in Africa.

Comparing the mean birth weights from Africa with those from the Pacific area shows that the African figures resemble those from Papua and New Guinea but are less than those from New Hebrides, Samoa and Micronesia as described by Oomen and Malcolm (1958).

#### Growth Curves.

It has been shown many times that infants in Africa, and in many other parts of the tropical world (Draper 1958)

usually do well and show satisfactory gains in weight during the first 6 months or so of life, but this course is maintained only so long as the mother's lactation is adequate for the child's needs.

After this period the growth curve flattens between approximately 8 and 16 months and then resumes a course almost parallel but below the corresponding curve for Europeans. (Malcolm, 1951; Massal, 1954).

There seems little doubt that malnutrition, among other factors, plays an important part in producing this state of affairs.

The comparatively, and rather unexpectedly, slight interference with growth produced by chronic malaria in a hyperendemic malarial zone in Western Nigeria was demonstrated by Jelliffe and Onwumere (1953). Bruce-Chwatt (1952) in Lagos found that the flattening of the weight curve from about five months onwards was present both in those infected with the malaria parasite and those free from infection, but was very slightly more marked in the malarious group.

#### Urine Examination.

The urine was examined in 138 males (73.4%), 2.8% of these had glycosuria and 31.3% albuminuria.

#### Proteinuria.

The proteinuria was estimated using "albustix", a paper

Table 20

MALES

MALES

PHYSIOLOGICAL DATA, LUNSAR

Age in Years	N	Mean Height cms. (ft. ins)	Mean Weight Kgms. (lbs)	URINE			Mean Hb% Tallqvist.	BLOOD PRESSURE		
				Number Examined	Glucose	Albumen		Mean Syst-olic mm.Hg.	Mean Diast-olic mm.Hg.	Mean Pulse Press. mm.Hg.
Under 1	8	-	6.04 (13.31)	-	-	-	50%	-	-	-
1 - 4	15	86* (2'10")	12.74* (28.09)	-	-	-	49.3%	-	-	-
5 - 9	26	120 (3'11")	22.57 (49.77)	22	-	1	54.1%	80.0	40.0	40.0
10 - 14	19	143 (4'8")	34.21 (75.43)	18	-	2	54.5%	91.54	50.77	40.77
15 - 19	14	161 (5'3")	48.70 (107.38)	13	-	6	60%	107.92	60.42	47.50
20 - 24	14	166 (5'5")	55.18 (121.67)	13	1	5	59.2%	112.50	66.07	46.43
25 - 29	26	168 (5'6")	57.30 (126.35)	16	1	4	60.7%	110.96	68.85	42.12
30 - 34	16	168 (5'6")	58.92 (129.21)	11	-	3	60%	118.33	73.33	45.00
35 - 39	20	167 (5'6")	58.60 (129.21)	17	-	6	60%	122.25	76.00	46.25
40 - 44	10	169 (5'7")	55.53* (122.44)	10	1	3	60.8%	111.50	72.00	39.50
45 - 54	11	166 (5'5")	56.11* (123.72)	11	-	9	62.5%	128.18	77.27	50.91
55 - 64	7	167 (5'6")	62.06 (136.84)	6	1	4	60%	131.43	82.86	48.57
65 - 74	2	166 (5'6")	53.75 (118.52)	1	-	-	70%	117.50	80.00	37.50
75 plus	-	-	-	-	-	-	-	-	-	-
Total	188			138	4	43		113.93	69.24	44.69
Percent				73.4	2.8	31.1	58.16 8.1gms/ 100 ml	Range 20 yrs+	Range 20 yrs+	Range 20yrs+

\* 1 in each group not taken

BLOOD PRESSURE READINGS mm HG

Age	Systolic (160 plus)	Age	Diastolic (95 plus)
35	170	24	100
39	180	30	100
48	160	33	100
50	160	45	100
60	190	50	95
		60	125

PHYSIOLOGICAL DATA. LUN SAR.

AGE IN YEARS	N	Mean Height cms. (ft. ins)	Mean Weight kgms. (lbs)	Mean Hb% Tall-qvist	Mean Systolic mm.Hg.	Mean Diastolic mm.Hg.	Mean Pulse Press. mm.Hg.
Under 1	6	-	6.33* (13.96)	45%	-	-	-
1 - 4	16	91 (3'0")	11.60* (25.58)	50%	-	-	-
5 - 9	29	118 (3'10")	20.32 (44.81)	57.9%	93.75	58.75	35.00
10 - 14	13	137 (4'6")	31.39 (69.21)	52%	95.56	60.00	35.56
15 - 19	22	150 (4'11")	43.89 (96.78)	55.0%	103.10	61.19	41.90
20 - 24	17	155 (5'1")	51.14 (112.76)	55%	105.88	62.94	42.94
25 - 29	25	156 (5'1")	54.82 (120.88)	57.8%	114.80	75.20	39.60
30 - 34	13	157 (5'2")	50.70 (111.79)	55%	118.46	74.62	43.85
35 - 39	18	158 (5'2")	55.04 (121.36)	60.7%	120.56	75.28	45.28
40 - 44	6	156 (5'1")	53.43 (117.81)	55%	115.00	70.83	44.17
45 - 54	11	159 (5'3")	54.85 (120.94)	56.4%	129.55	78.18	51.36
55 - 64	6	153 (5'0")	53.20 (117.31)	59.0%	145.83	75.83	70.00
65 - 74	3	155 (5'1")	51.25 (113.01)	55%	170.00	91.67	78.33
75 plus	-	-	-	-	-	-	-
TOTAL	185				114.89	70.30	44.59
PERCENT				55.99% 7.8 gm/ 100 mL	Range 20yrs + 90-200	Range 20 yrs + 50-110	Range 20 yrs + 25 - 100

\* 1 in each group not taken

BLOOD PRESSURE READINGS mm. Hg. :			
	Age Systolic (160+)	Age Diastolic (95+)	
	28	160	26 100
	35	160	28 110
	47	175	28 100
	50	160	35 95
	55	180	50 100
	60	200	60 100
	60	160	65 100
	65	190	68 95
	68	180	

TOTAL

Table 22

TOTAL

PHYSIOLOGICAL DATA, LUNSAR.

AGE IN YEARS	N			Mean Height cms. (ft.ins)	Mean Weight kgms. (lbs)	Mean Hb% Tall- qvist	Mean Systolic mm.Hg.	Mean Diast- olic mm.Hg.	Mean Pulse Press. mm.Hg.
	M	F	T						
Under 1	8	6	14	-	6.15* (13.56)	48.6%	-	-	-
1 - 4	15	16	31	89 (2'11")	12.08* (26.64)	49.7%	-	-	-
5 - 9	26	29	55	119 (3'11")	21.39 (47.16)	55.6%	91.0	55.0	36.0
10 - 14	19	13	32	140 (4'7")	33.07 (72.92)	53.7%	93.18	54.55	38.64
15 - 19	14	22	36	154 (5'1")	45.76 (100.90)	57.9%	104.85	60.91	43.94
20 - 24	14	17	31	160 (5'3")	52.97 (116.80)	57.1%	108.87	64.35	44.52
25 - 29	26	25	51	162 (5'4")	56.08 (121.78)	59.8%	112.84	71.96	40.88
30 - 34	16	13	29	163 (5'4")	55.23 (121.78)	59.4%	118.39	73.93	44.46
35 - 39	20	18	38	163 (5'4")	56.91 (125.49)	60.2%	121.45	75.66	45.79
40 - 44	10	6	16	163 (5'4")	54.69* (120.59)	60.0%	112.81	71.56	41.25
45 - 54	11	11	22	163 (5'4")	55.45* (122.27)	59.2%	128.86	77.73	51.14
55 - 64	7	6	13	161 (5'3")	57.97 (115.21)	59.4%	138.08	79.62	58.46
65 - 74	2	3	5	159 (5'3")	52.25 (115.21)	58.8%	149.00	87.00	62.00
75 plus	-	-	-						
	188	185	373			56.8%	114.41	69.77	44.64
						7.9gms per 100 ml.			

\* One in each group not taken.

Table 23

Mean Birth Weight.

Figures extracted from records of Marampa Mines Health Centre  
1953 - 1958

LIVE BIRTHS	Mean Weight	N.	S.D.
Males.	6.51 lbs. 6 lbs. 8 ozs. (2.95 kg)	113	1.2692 1.27
Females.	6.46 lbs. 6 lbs. 8 ozs. (2.97 kg)	97	1.200
Total live births.	6.49 lbs. 6 lbs. 9 ozs. (2.95 kg)	210	1.2380 1.24
Still births.		19	
Total live and still births.		229	

Actual range 2 lbs - 9 lbs.7ozs. 43 (20.4%) live births weighed 5 lbs. 8 ozs. (2.5 kg) or less. This is the international standard of prematurity.

The following are average mean birth weights from other African territories. (Jelliffe, D.B. (1955)).

Nigeria	Lagos .....	6 lbs.13 ozs. (3.09 kg)
	Ibadan .....	6 lbs. 5 ozs. (2.86 kg)
	.....	6 lbs.10 ozs. (3.01 kg)
Congo, Mayumbe .....	6 lbs. 7 ozs. (2.92 kg)	
Uganda, Kampala .....	6 lbs. 8 ozs. (2.95 kg)	
Nyasaland, Rural .....	6 lbs.9 $\frac{1}{2}$ ozs. (2.99 kg)	
Southern Rhodesia, Salisbury.	6 lbs. 5 ozs. (2.86 kg)	
Union of South Africa,		
	Durban .....	6 lbs.12 ozs. (3.07 kg)

Table 23A

Mean Heights and Weights - Children

MALES

FEMALES

Age	N = 22		N = 30		N = 25		N = 35	
	Height Cms.	Ins.	Weight Kgms.	lbs.	Height Cms.	Ins.	Weight Kgms.	lbs.
1 m	-		3.80	8.36	-		-	
2 m	-		3.95	8.69	-		-	
3 m	-		-		-		-	
4 m	-		5.00	11.0	-		5.85	12.87
5 m	-		7.30	16.06	-		8.20	18.04
6 m	-		8.10	17.82	-		7.20	15.8
7 m	-		-		-		-	
8 m	-		-		-		4.53	9.9
9 m	-		-		-		-	
10 m	-		-		-		-	
11 m	-		-		-		-	
1 yr	-		-		72	28.8	7.93	17.4
1½ yrs	74.75	29.9	9.48	20.86	-	-	8.95	19.69
2 yrs	73.67	29.5	9.62	21.16	64	25.6	9.87	21.7
2½ yrs	83.00	33.2	10.90	23.98	-		-	
3 yrs	92.25	36.9	15.53	34.16	90.64	32.26	12.98	28.55
3½ yrs	-		-		-		-	
4 yrs	107.00	42.8	17.10	37.6	106.00	42.4	14.80	32.6
4½ yrs	-		-		-		-	
5 yrs	107.36	42.9	18.21	40.06	102.44	41.0	15.44	33.96

Although the above figures are few in number it can be seen that during the first 6 months of life, when breast milk is the main or only source of food for babies, growth is comparable with the British average. Then growth slackens for a period and starts to pick up at 2 years and to remain parallel to the British average.



strip test.

Baron and Newman (1958) and Frazer (1958) have discussed the significance of this method.

The estimated quantities found in the sample are given below.

	<u>Urine Protein Concentration in mg/100 ml.</u>				
	Trace	30	100	300	600
Number of Males Positive	4	26	7	5	1

60.4% of cases had a urine protein concentration of 30 mg/100 ml. 5 cases (11.6%) had associated hypertension, one with 30 mg/100 ml., two with 100 mg/100 ml. and two with 300 mg/100 ml.

The proportion of positives for proteinuria increases with age. Females were not examined.

The rates are high and the causes were not investigated. According to Frazer (1958) albustix are equally sensitive to albumin and mucoprotein from the urinary tract. Among the conditions causing this high positive rate may be pyelo-nephritis, due to a number of causes including gonorrhoea, and stated by Trowell (1960) to be one of the commonest diseases of the renal tract in Africa.

Glomerulo-nephritis and other cosmopolitan diseases may be present in the sample but the effect of malaria must not be overlooked. Macgraith (1948) considered that transient proteinuria occurred in 20 - 60% of patients

infected by falciparum malaria. This is the same rate as the focal embolic nephritis occurring in any severe fever.

Recent sexual activity may also give a positive response with albustix.

#### Glycosuria.

There has been little work done on the prevalence of diabetes in tropical communities, but there has been much discussion on the types of diabetes seen in different countries (Cosnett, 1959; Campbell, 1960; Jarrett, Pyke 1961). The general mildness of the disease has been stressed, although this is not always the case. In some cases there is a lessened tendency to ketosis as in Jamaicans and Natal Indians.

Further investigations were not made in Lunsar.

#### Haemoglobinometry.

This was determined by Tallqvist's method. This method is a comparatively crude one but the mean figures show that there is a tendency for the haemoglobin percentage to increase with age, up to about 15 years and then to flatten off, as would be expected. Also the mean level for males 58.16% (N = 117) is higher than that for females 55.99% (N = 76). The range for males is 45-90% and that for females 45 - 70%.

There is some confusion as to the levels of haemoglobin

in grams per 100 ml. indicated by percentage haemoglobin estimated by various methods, and indeed, by the same method.

According to Gradwohl (1956) the following standards have been used.

Table 24

Haemoglobin in Grams per 100 ml. Blood by Various Standards

Sahli	100%	13.8	14.0	14.5	17.0	17.2	17.3
Tallqvist	100%	13.8	15.6	15.8	16.25	16.5	
Haldane	100%	13.8	14.8				

Different textbooks quote different figures for the same instrument and method. They also quote different figures for the mean haemoglobin levels (in gms. per 100ml.) for normal healthy males and females.

According to Albritton (1952) normal mean haemoglobin levels in healthy Americans are 15.8 gms. per 100 ml. for males with a range of 14.0 - 18.0 gms. per 100 ml. and 13.9 gms. per 100 ml. for females with a range of 11.5 - 16.0 gms. per 100 ml.

According to Hutchison and Hunter (1949) the mean for healthy men may be taken as 15.6 gms. per 100 ml. and the mean for women as 13.7 gms. per 100 ml.

It will be noted that on the Tallqvist scale there is no means of estimating a percentage haemoglobin greater than 100%. In fact the highest reading recorded was 90% Hb

in a healthy male.

Taking 13.8 gms. per 100 ml. as equivalent to 100% on the Talloqvist scale, the mean haemoglobin level for males is 8.1 gms. per 100 ml. and that for females 7.8 gms. per 100 ml. These are considerably lower than U.K. or U.S.A. standards and are indeed lower than the community examined by Walters (1958) at Ilobi, Nigeria. The maximum levels seem to be reached by the 20 - 29 age group in males, and by the 30 - 39 age group in females.

At birth, European infants have high haemoglobin levels but there is a considerable physiological fall from birth in the first few months of life. This fall levels off about the third month and remains fairly steady until about the sixth year when the haemoglobin starts to climb to the adult level reaching it at about 15 years.

The number of persons examined in the younger age groups, in Lunsar, was too small to indicate such changes.

#### Blood pressure.

130 males and 133 females had their blood pressure measured. 6.9% of males and 9.0% of females were hypertensive.

The recorded mean blood pressure lie on the lower side of the normal range of blood pressures for age and sex for Europeans and Americans (Master 1952; Smirk, 1957). Mean systolic and diastolic pressures of females at age 45 years are higher than those of males. Blood pressures

are considered to be hypertensive when over 160 mm Hg systolic or 95 mm.Hg diastolic (W.H.O. Expert Committee, 1959). American negroes have higher blood pressure levels than whites (Comstock, 1957).

In Donnison's (1929) series from Kenya, the mean blood pressure in mm.Hg. rise from 123.07 (systolic) and 81.89 (diastolic) at age 15-19 to the highest levels 126.37 (systolic) at age 25-29 and 85.86 (diastolic) at 35-39. The mean levels then fall progressively to 105.76 (systolic) and 66.98 (diastolic) at 60 years and over. This pattern contrasts with that seen in Europeans where this a steady rise in both systolic and diastolic pressures with age.

The Lunsar series is also seen to rise fairly steadily with age in both systolic and diastolic pressures. In the younger age groups blood pressure levels are lower than the Kenya series. The two groups have similar levels at the 30-40 age group.

In European populations, in young adult life, females have lower mean systolic pressures than males, whereas among older persons, males have lower systolic pressures. The difference between the sexes is not noticeable in Lunsar in the younger age groups but the higher levels for females are noted in the older age groups.

Hypertension in African populations has been reviewed recently by Walker et al (1960) and Somers (1960).

Maddocks (1961) reported on the blood pressure levels in two Pacific Island populations. The mean systolic and diastolic levels for each sex and age group in Lunsar are lower than the corresponding groups in the two populations, except, for females over 55 years in Lunsar who have higher levels.

7.4.3. Fertility and Survival, Lunsar.

Fertility and Survival and the ages at which children died are set out in Tables 25 and 26.

Fertility.

Crude Birth Rate.

It was difficult to find out accurately the number of live births occurring during the calendar year.

As has been stated elsewhere, the Temne do not know the names of the months of the year. Also, the months themselves are variable starting at different times in different parts of the country. The months, are related to harvest and other agricultural activities which are themselves variable.

33 children, 19 males and 14 females were born in the year under review to the 121 females in the clinical sample aged 15 and over.

Some children may have been born and died during the past year which have not been included. The figures for live births therefore tend to be lower than the true figures.

33 live births, occurred in the last year, 1959, in a mid-year total population of 380 (189 males, 191 females). The Crude Birth Rate is therefore 86.8 per 1,000.

From the Registers of Births in Lunsar the following figures have been extracted.

Table 25

## FERTILITY AND SURVIVAL, LUN SAR

AGE	Persons	1 Live Births			2 Still Births			3 Total Births Live and Still			4 Live Births in Last Year			5 Stillbirths in Last Year			6 Live Births Dying with- in year			7 Multiple Pregnan- cies live (still)	8 Abort- ions	9 Living Children			10 Children Dying			11 Females Never Preg- nant	12 Non- Fert- ile married females	13 One Preg- nancy only	14 Child- less fe- males	15 All Chil- dren dead	16 Single	17 Ever marr- ied
		M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T			M	F	T										
15-19	22	6	5	11	-	-	-	6	5	11	-	3	3	-	-	-	-	-	1	twins MM	1	4	4	8	2	1	3	16	7	4	17	-	9	13
20-24	17	16	17	33	-	-	-	16	17	33	5	2	7	-	-	-	-	-	1	twins MM	1	8	15	23	8	2	10	2	2	4	4	1	-	17
25-29	25	33	38	71	6	3	9	39	41	80	5	4	9	1	1	2	1	3	4	twins MF (1 still MF)	7	22	27	49	11	11	22	2	2	2	4	1	-	25
30-34	13	18	33	51	2	-	2	30	33	53	4	4	8	-	-	-	-	1	1	twins MM	9	10	22	32	8	11	19	1	1	-	1	-	-	13
35-39	18	45	29	74	4	4	8	49	33	82	4	-	4	-	-	-	1	-	1	twins FF (2 still MM FF)	14	25	20	45	20	9	29	-	-	-	2	2	-	18
40-44	6	14	15	29	1	1	2	15	16	31	-	-	-	-	-	-	-	-	-	twins FF	7	12	12	24	2	3	5	-	-	1	-	-	-	6
45-49	9	22	16	38	2	2	4	24	18	42	1	1	2	-	-	-	-	1	1	twins FF	6	14	9	23	8	7	15	-	-	1	1	1	-	9
50-54	2	4	4	8	-	1	1	4	5	9	-	-	-	-	-	-	-	-	-	-	1	1	2	3	3	2	5	-	-	-	1	1	-	2
55-59	3	12	4	16	-	-	-	12	4	16	-	-	-	-	-	-	-	-	-	2 twins 2MM	2	3	-	3	9	4	13	-	-	-	-	-	-	3
60-64	3	5	7	12	-	-	-	5	7	12	-	-	-	-	-	-	-	-	-	1 twins MF	-	2	2	4	3	5	8	-	-	-	-	-	-	3
65-69	3	8	12	20	-	-	-	8	12	20	-	-	-	-	-	-	-	-	-	-	2	3	3	6	5	9	14	-	-	-	-	-	3	
70-74	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
75 +	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total	121	183	180	363	15	11	26	198	191	389	19	14	33	1	1	2	2	5	7	10 twins (3 still)	50	104	116	220	79	64	143	21	12	12	30	6	9	112

Table 26

LUNSAR.

FEMALES

AGES AT WHICH CHILDREN DIED. LUNSAR.

Age group of mother N	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75 plus	total			
Age at Death	NUMBERS OF CHILDREN DYING													M.	F.	Total	Percent
0 - 1 m.	-	2	3	3	4	2	1	4	-	3	-	-	-	11	11	22	15.3
2m - 1 yr.	1	3	8	6	15	1	6	1	5	2	4	-	-	30	22	52	36.4
Under 1 yr.	1	5	11	9	19	3	7	5	5	5	4	-	-	41	33	74	51.7
1 - 4 yrs.	2	5	11	9	8	2	4	-	4	2	1	-	-	28	20	48	33.5
5 - 9 yrs.	-	-	-	1	1	-	-	-	3	1	3	-	-	5	4	9	6.3
10-14 yrs.	-	-	-	-	-	-	1	-	1	-	3	-	-	1	4	5	3.5
15-19 yrs.	-	-	-	-	1	-	2	-	-	-	1	-	-	2	2	4	2.9
20 plus	-	-	-	-	-	-	1	-	-	-	2	-	-	2	1	3	2.1
TOTAL	3	10	22	19	29	5	15	5	13	8	14	-	-	79	64	143	100.1



Registered Births, Lunsar

Year	Males	Females	Total
1956	39	29	68
1957	72	44	116
1958	58	50	108

Taking the 1958 population of Lunsar at 9,000 the Crude Birth Rate worked out on this basis is 12.0 per 1,000.

This is a measure of the under-registration of births. Under-registration also occurs in Freetown where the Crude Birth Rate is 29.6 per 1,000 for 1958. This figure is calculated from the total live births 4,513 extracted from the Registers and using a population of 152,000 estimated by the World Health Organisation Tuberculosis Survey team.

Even if the population of Freetown is taken to be 100,000 the usual estimate, the Crude Birth Rate is 45.1 per 1,000. Under-registration probably occurs in Freetown but not the same extent as in Lunsar.

Fertility Rate.

The number of births in the population is dependent upon the proportion of women of childbearing age, especially married women, in the community. In this study the reproductive age period in women is taken as being 15 - 49 years (Swaroop, 1960), instead of 15 - 45 as is more usual. This was done because, the estimation of ages in

the region of 45 years is inaccurate, and the period 15 - 49 included all females having given birth during the last year. In view of these factors there is no reason why the fertility rate calculated in this way should not be compared with the rates calculated in the conventional way.

In the Lunsar Clinical Sample there were 110 females in the 15 - 49 age group. In the year (1959) under review there were 33 births, this gives a General Fertility Rate of 300 per 1,000. This rate is of a high order. 57 females in Lunsar aged 30 and over gave birth to 248 live births. The mean number of children born alive to each female in these age groups is therefore 4.3. Of the 11 females in the reproductive age group, 9 (8.2%) were unmarried and 2 (1.8%) widowed. Of the 101 females who were married or had been married 12 (11.8%) had never been pregnant. No unmarried female had been or was pregnant.

#### Family Size.

This is taken to mean the average number of live births to a married female of "completed fertility", i.e., one in which the wife has passed the limit of the childbearing period, it includes childless as well as fertile females.

From the distribution of ever-married women by number of children born alive (Table 26A) it can be shown that 40.3% of women of 30 and over had 2 live born children

and 33.3% had 4 live born children, 35% of women of completed fertility had 2 children only. The average number of children born alive to married females of completed fertility, i.e., of 45 years and over was 4.7.

The Fertility Census of 1911 investigated this matter and it was found that in England and Wales the average size of completed family fell from 5.71 for women born in 1841-45 to 4.66 for women born in 1861-65. Since 1900 there has been a further steady fall so that for persons married in 1925-29 the estimated average size of completed family was 2.19 children.

For marriages taking place about 1860, 30% of females had an average of 6 children and for marriages of 1925, 50% of females had 1.5 children. Victorian families were well spread out over various sizes of family but modern families concentrated on the smallest sizes.

#### Sterility.

Of the 12 non-fertile females, 6 had been married less than one year. 2 had been married for 2 years, one for 4 years, one for seven years and two for 10 years.

There were thus 3 (2.9%) sterile females in the reproductive age groups by the definition of sterility as married for seven years or more without a pregnancy.

12 females (9.9%) had had one pregnancy only, in the age groups 15 years and over.

The youngest married female was aged 10.

Table 26A

Distribution of Ever-married women by Number of Children born Alive.

Present age of Woman	Number of women with the following number of children born alive												Total number of Women	
	0	1	2	3	4	5	6	7	8	9	10	11		12
15 - 29	14	11	7	10	9	1	2	1	-	-	-	-	-	55
30 - 44	1	2	9	3	6	5	6	2	1	2	-	-	-	37
45 and over	1	-	7	-	4	1	2	1	-	1	2	1	-	20
TOTAL	16	13	23	13	19	7	10	4	1	3	2	1	-	112

4:7

14:1

2:1

Table 26B

Distribution of Ever-married women by Number of Children Born Alive

Present Age of women	Number of women with the following number of children born alive												Total number of women	
	0	1	2	3	4	5	6	7	8	9	10	11		12
15 - 29	7	5	4	6	6	-	2	1	-	-	-	-	-	31
30 - 44	1	1	1	-	3	1	2	-	-	1	-	-	-	10
45 and over	-	-	-	-	-	-	-	1	-	1	-	1	-	3
TOTAL	8	6	5	6	9	1	4	2	-	2	-	1	-	44

Average number of children born to females 45 and over is 9

Table 26C

Distribution of ever-married women by Number of Children Born Alive

Present Age of women	Number of women with the following number of children Born Alive												Total number of women	
	0	1	2	3	4	5	6	7	8	9	10	11		12
15 - 29	7	6	3	4	1	-	-	-	-	-	-	-	-	24
30 - 44	-	1	8	3	3	4	4	2	1	1	-	-	-	27
45 and over	1	-	7	-	4	1	2	-	-	-	2	-	-	17
TOTAL	8	7	18	7	10	6	6	2	1	1	2	-	-	68

Illegitimacy.

In a society where females are frequently married before puberty, and where polygyny is common, illegitimacy will tend to be a fairly rare event. Undoubtedly extra-marital intercourse does occur and the offspring of such a relationship will be illegitimate in the technical sense. The Africans do not appear to view illegitimacy in the same way of Europeans, and any attempt to assess an illegitimacy rate would be fruitless.

Multiple Pregnancy Rate.

There were 10 live sets of twins among 363 births. 3 sets of stillborn twins. This gives a Multiple Pregnancy Rate of 27 per 1,000 live births. (Number of multiple births  $\div$  Total live births x 1,000).

5 sets of twins were males, 2 sets were females and 3 sets were males and females.

Sex Ratio at Birth.

Using total live births of all the females in the sample the Sex Ratio is calculated to be 101.6 liveborn females.

The Sex Ratio of Registered Births in Lunsar for the years 1956-1958 is 137.3 liveborn males for 100 liveborn females. The males are more frequently registered than females.

Survival.

Crude Death Rate

From the Registers of Death in Lunsar the following

figures have been extracted.

Registered Deaths, Lunsar

Year	Males	Females	Total
1956	31	25	56
1957	25	22	47
1958	46	37	83

Taking the 1958 population of Lunsar at 9,000, the Crude Death Rate works out at 9.2 per 1,000.

It has already been shown that Births and Deaths are grossly under-registered in Lunsar. The other important factor affecting the Crude Death Rate is the population structure. It will be remembered that Lunsar has a young population with only 10.8% of the population of 45 years or older.

In Freetown it is estimated that the Crude Death Rate is rather more than 20 per 1,000 population (Sierra Leone Government, 1960).

Age-Specific Death Rates.

This can be estimated by extracting the Lunsar Death Registers and using the age-groups of the Lunsar Sample Census. The 1958 Death Register figures will have to



be used against the 1959 population.

LUN SAR

Age	Registered Deaths 1958 (Both Sexes).	Estimated Population 1959	Age-specific death rate per 1000
0-1 month	(4)		
Under 1 year	15	360	41.6
1 - 4 years	28	910	30.7
5 - 9 years	4	1,390	2.8
10-14 years	1	750	1.3
15-19 years	3	940	3.3
20 plus	32	5,190	6.1
	83	9,540	8.7

For the Clinical Sample proportional death rates are given in Table 26 showing the ages at which children died.

Death rates are bound to be higher in the older age groups, but as these figures are from obstetric histories and most females are in the younger age groups there appear to be fewer deaths in the older age ranges.

51.7% of the deaths recorded occurred under 1 year.

Williams (1958) draws attention to the toddler mortality. i.e., in the 1 - 4 age group, and states that this is the most sensitive index of the health of a

community, the disadvantage of bad conditions bearing most heavily on children between the ages of 1 and 5.

In the absence of accurate registration this rate is difficult to calculate. Some indication of this rate may be comparing deaths in the 1 - 4 age group with the under 1 age group. There were 48 deaths in the 1 - 4 age group, compared with 74 deaths under the age of 1.

The Infant deaths-Toddler deaths ratio is therefore 1.5. For comparison the figures for Ghana for 1954-57 vary from 1.21 in the Eastern Region to 0.77 in the Northern Region with a figure of 1.2 for all Ghana, which is the same as the rate for England and Wales in 1838-54. Platt (1959) considers that there is an increasing amount of evidence that there is a close relationship between malnutrition and morbidity and mortality in the infant and young child.

Wills and Waterlow (1958) have suggested that the death rate at ages 1 - 4 years might be used as an index of the nutritional state of a country.

The Infant deaths-Toddler deaths ratio increases with favourable conditions since toddler deaths are reduced by medical care and better environmental conditions more rapidly than infant deaths.

#### Specific Death Rate by Sex.

Using the Sample Census Population for 1959 and the figures for 1958 from the Death Registers.

The Specific Death Rates by sex, all ages, are as follows:-

Males 9.8 per 1,000

Females 7.6 per 1,000

The mortality is generally at a lower level among females than among males.

This is shown in the Clinical Sample where deaths of males are proportionately higher than females, especially in the younger age groups.

At the time of the survey, 43.1% of male children born alive to the females in Lunsar had died, compared with 35.5% of female children.

Infant Mortality Rate.

The Infant Mortality Rate is regarded as being one of the most sensitive indices of health condition of the general population. It is sensitive because a baby in its sudden encounter with a new environment is exposed to a multitude of new factors and the Infant Mortality Rate reflects this relationship.

From the Lunsar figures from the Clinical Sample the Infant Mortality Rate is 212.2 per 1,000. The recorded Infant Mortality rate for Freetown was 124.9 per thousand live births in 1958.

As has already been stated it was difficult to find out the number of children born in the year under review

and also equally difficult to find out which live births had subsequently died in the same year.

If a child is born and lives only a very few days it may be disregarded by the mother or considered to be born dead. This distinction was made with mothers as carefully as possible but it is likely that both births and infant deaths are under-recorded. It was notable that many women gave the ages at death of their children precisely, including the number of days. If a calculation is made based on all the females in the Clinical Sample (121) using total number of live births to all these females, 363, and the number of these who died under 1 year of age, 74; the mortality rate for these infants is 203.8 per 1,000 which closely approximates to the rate calculated in the conventional way.

Out of 143 children who died, 22 died under 1 month (15.3%), 74 died under 1 year (51.7%) and 48 (33.5%) died in 1 - 4 age group.

This rate is similar if calculated for the women of 50 years and over. 11 females of 50 years and over had 40 children who died, 19 (47.5%) of whom died under 1 year. All the females in the sample gave birth to 183 males and 180 females. 60.6% of these were surviving at the time of the enquiry, 56.8% males and 64.4% females.

Stillbirth Rate.

For the calculation of this rate late foetal deaths or stillbirths are used.

There were 2 stillbirths in Lunsar in the year under review out of 35 live and stillbirths.

This gives a Stillbirth Rate of 57.1 per 1,000 live and stillbirths, or 66.8 per 1,000 if totals are used.

Out of 13 sets of twins born to the females in Lunsar 3 (23%) were stillborn. The stillbirth rate for Britain is about 25 per 1,000 at the present time.

Abortions.

121 females who were married or had been married had 50 abortions, a rate of 0.41 per females. There were 113.8 abortions per 1,000 pregnancies.

In evidence given to the Royal Commission on Population it was stated that "the proportion of all pregnancies ending in spontaneous abortions may be placed between the relatively narrow limits of 7 and 11 per cent." The Lunsar figure lies at the upper end of the scale.

The proportion of induced abortions in Britain is estimated at between 2 and 5 per cent. The proportion of induced abortions in Lunsar is not known but from the attitude of the women towards pregnancy I would regard it as being low.

Commentary.

From the data and calculations made it will be seen that Lunsar has a high birth rate and fertility rate.

No attempt was made to collect data for, or to calculate general death rates from the sample census or the clinical sample.

From the obstetrics histories taken the infant mortality rate is high and 29.7% of deaths under 1 year occurred the first month.

7.5. Comparison between the "rural" and "urban" groups in Lunsar.

The people of Lunsar may be divided into two occupational groups, those who receive a regular cash wage and those whose work is rural and who depend on agriculture for their livelihood. This latter group suffer from seasonal fluctuations in the availability of their produce as well as spending a large portion of their time in the fields.

Lunsar is not a large town and its fringe with rice fields surrounding it does not differ very much from the village setting. However, the "urban" person works for a wage packet and is enabled to buy food all the year round. Mineworkers each get a kettle of rice (about 20 lbs) in addition to their wages which are paid every two weeks. This is in contrast with the economy of the "rural" worker who must feed himself and his family throughout the "hungry season" from April to November, during which time, because of heavy rainfall, nothing ripens. The question of diet was not investigated but

it will be seen from the list of foods available in Lunsar market that there is a wide variety. (See Appendix).

It is a common occurrence for the rice farmer to sell his crop and not leave enough for his own needs. Many families end up the hungry season eating only green leaves and a little rice. Much of the rice seen in Lunsar is parboiled. The categories are divided as follows:-

<u>"Urban"</u>	<u>"Rural"</u>
Clerk.	Butcher.
Cook.	Farmer.
Employed labour.	Home help.
Industry (Entirely mining).	Trader - non-literate
Literate Trader.	Schoolboy (Arabic School).
Native Administration personnel.	
Schoolboy, R.C. or C. of E. Schools.	
Tailor.	

As the numbers are small the dependants and associates of each group are included.

It was found necessary to put into categories the two types of schoolboy because frequently these boys live in Lunsar with families, other than their own, and attend school. The Roman Catholic and Church of England Schools are fee-paying. Arabic schools are

non-fee paying schools only, and the pupils are frequently employed by the Imam or Alpha on their farms as unpaid help in return for tuition. The Arabic schools population is, therefore, tied to the rural group. Fees are much more likely to be paid by wage earners.

It was considered that the differences in the way of life between "urban" and "rural" groups in Lunsar might show themselves in certain health indices and so these were extracted using the two categories. Persons were put into one of the two groups according to their attributes and figures were calculated.

Morbidity.

Figures were extracted for malaria, onchocerciasis and nutritional deficiency. Tables 27 - 29.

Table 27  
Malaria in Urban and Rural Groups. Lunsar

	Males	Females	Total
<u>URBAN.</u> N =	103	79	182
Positive	87	53	140
% Positive	84.5	67.1	76.9
<u>RURAL.</u> N =	82	103	185
Positive	68	78	146
% Positive	82.9	75.7	78.9

The rates for males are about the same in urban and rural groups, but urban females have a more favourable rate.



Table 28

Onchocerciasis in Urban and Rural Groups. Lunsar.

	Males	Females	Total
<u>URBAN.</u> N =	107	80	187
Positive	57	28	85
Positive %	53.3	35.4	45.7
<u>RURAL.</u> N =	82	111	193
Positive	44	56	100
Positive %	53.7	50.5	51.8

The rates for males are the same in both groups, but urban females have a more favourable rate.

Table 29

Nutritional Deficiency in Urban and Rural Groups, Lunsar

	Males	Females	Total
<u>URBAN.</u> N =	107	80	187
Positive	12	15	27
Positive %	11.2	19.0	14.5
<u>RURAL.</u> N =	82	111	193
Positive	17	20	37
Positive %	20.7	18.0	19.2

Rural males have a markedly higher rate than urban males. The rural females have a similar rate to urban females.

From the tables it will be seen that the morbidity rates for these three conditions tend to be higher in the rural occupation group than in the urban occupation group as previously defined. Females have more favourable rates in the urban group than in the rural group. This suggests that the urban occupation is healthier than the rural occupation group with regard to these conditions.

Fertility and Survival.

This is set out in Table 30.

Table 30.

Survival in Urban and Rural Groups, Lunsar

	No. ever-married Females Aged 15 plus	Live Births	Live births per fem- ale	No. Died Under 1 Year	Total No. Died
Urban	44	142	3.2	20 (14%)	51 (35.9%)
Rural	68	221	3.2	54 (24.4%)	92 (41.6%)
Total	112	363	74	143	

From the above it can be seen that there are the same number of live births per urban married females compared with rural married females.

From the distribution of Ever-married women by number of children born alive (Tables 26A, B, C) it will be

seen that there are only 3 urban females of 45 years and over compared with 17 rural females in the same age group. The average numbers of children born to these groups were 9 and 3.9 respectively, but in view of the smallness of the numbers involved these figures cannot be considered to be significant.

14% of live births died under 1 year in the Urban group compared with 24.4% in the Rural group.

Similarly for total deaths as a percentage of live births the rates are 35.9% for the Urban group and 41.6% for the Rural group. Thus 64.1% of the Urban group and 58.4% of the Rural group, of live births, were surviving at the time of the enquiry. Thus it will be seen that within Lunsar itself there are indications that there are differences in morbidity and survival experience in the two occupational groups defined.

Taken by age group, the rates of survival are better for those children born of mothers in the younger age groups.

Table 30a  
Survival by Age-group of Mother.

Age Group	N	Live Births	No. died under 1 year	Total No. died
15 - 34	77	169	33 (19%)	55 (32%)
35 - 75	44	194	85 (25%)	90 (51%)
	121	363	118	145

It will be shown in a subsequent section that these differences are much more marked when the villages are compared with Lunsar town.

#### 7.6. The Handicapped In Lunsar.

There are a number of handicapped persons in Lunsar and seven of these were investigated from the following points of view:-

- (1). Can person feed himself?
- (2). Who provides his food?
- (3). Does he require attention of a second person?
- (4). Who provides his clothes?
- (5). Where does he pass the day?
- (6). Where does he sleep?

Personal interviews were carried out in each case, usually in the street.

#### Mentally Deranged Persons.

Bull. Female 26 years. Temne.

This woman has one living male child of 18 months and has had three who have died. The father of the present child is Ba Nabum Kanu and he does not maintain the woman or child.

This woman talks quite sensibly but her mentality is that of a high grade mentally defective. She says that people say she is crazy. She occasionally dances in the streets alone. (Dancing in the streets in groups is a normal practice). When offered a cigarette, she did not

know how to light it.

She can feed herself and take care of herself and child. She lives and sleeps in Pa Yamba's house in Port Loko Road, where she helps with the housework. Her sister, who lives in the same house, provides her with food, the sister being a trader as are most women. Bull herself begs for food, money and clothes.

Yakla aged 40 years. Male. Temne.

This man is a high grade mentally defective and has a paretic right leg. He is frequently tormented by the children of the town and driven off with shouts, abuse and stones. I have rescued him from such a situation on many occasions and he is friendly towards me.

Yakla can feed himself and answers questions clearly. He begs his food but complains that he does not get a full belly although he looks to be well fed. He sleeps on the verandah of Nasif Basma's house - a Lebanese trader. He also begs for clothes and money, and his days are spent on the streets. He has no family. He was born at Makel but has no relative living there.

Mosiri aged 14 years. Male. Temne

This boy is a high grade mentally defective and talks quite sensibly.

He sleeps in the market and he lives mostly on the streets. He also lives in the back of a house on the road to Madgbo, Rogaden Street. The owner of this house is Yambolay. Mosiri has relatives in the villages.

His father lives at Ruyel and his mother at Monoko. He begs for food and clothes and he can feed himself. He is also allowed to get rice from Yambolay's house. He cannot work.

He does not want to return to his parents because he was turned out by his mother. He said his mother rubbed peppers in his eyes to kill him and so he left home, and walked to Lunsar. He returned to his village once, but only his grandmother was kind to him and so he left again.

He likes Lunsar, he eats well most of the time but gets hungry occasionally. He has a happy disposition and can usually be seen munching a hunk of bread in the streets.

Molai aged 35 years. Male. Temne.

This man is usually clothed only in a pair of trousers or shorts and has all sorts of cutlery sticking out of his pockets. He occasionally wears a hat. He walks about in a theatrical manner and at times, said to be at full moon, he will become excited and stride up and down the street giving a loud, angry monologue, which sounds quite menacing. I have myself witnessed this as it occurred outside my house at about 2 a.m. on one occasion. The tirade lasted about 30 minutes with Molai marching up and down the street. He has never caused any trouble or fought anybody; he only amuses the crowd

and he seems to enjoy his own performance. Molai does not appear to be a defective, but he is highly eccentric, and is probably a chronic schizophrenic.

He has relatives at Waterloo, near Freetown, where he was born. He talks quite intelligently and answers questions. He can feed himself. He sleeps in the market and begs for food, clothes and money in the streets. He can usually be seen sitting in the gutter of the main street, King Edward Street. It is said that he will not eat when the moon is full and he walks the streets at night.

He is said to have once been a "rich" man and a good barber.

Santiki, aged 35 years. Male. Temne.

Another high grade defective. He can talk but seldom does so. He gets his food and clothes in the streets by begging and he sleeps in any house, usually on the verandah. He lives in the streets. He once worked for the PWD at Port Loko.

#### Discussion.

It will be noted that these five mentally deranged persons are all able to "defend themselves against common dangers" and to find their food, clothing and shelter. In my survey I came across only one defective child, pro-

bably a Cretin. I could find no seriously handicapped child in Lunsar who was being cared for by a second person, and one must assume that the grossly defective do not survive or are not allowed to survive, they may even be killed.

It is considered by Sinclair (1957) that the rate of mental defect in the native population of New Guinea is relatively uniform and is of the same order as that found in European populations.

The rate of mental defect in children of school age in Brisbane, Australia, is 3 per 1,000. This corresponds with the rate of 4 per 1,000 for the Mekeo of Papua.

The mentally defectives of Lunsar were only 6, a rate of 0.6 per 1,000 which is an unusually low figure. The Temne story for dealing with a defective child is as follows: The defective child is put in the bush together with some Kola nuts. The hunter is in hiding. As the child sits up to eat the Kola nuts (both of these acts would be impossible for an infant), the hunter shoots it. A magician called Abu Kamara said he had been present on five such occasions.

Defectives are said to be devils and the child is put in the bush. If the next day the child is not found, it is truly considered to have been a devil. If the child is strong enough, it will be raised by the family.



Physically Handicapped Persons.

Alfa Konteh. 68 years. Male. Limba.

Alfa has been completely blind since 1939. He was born at Kamabai near Makere in Bombali District, and he lived there for 40 years, worked with Delco at Salmarank in 1931, Marampa from 1931-1936 and from 1936-39 worked for Delco at Tonkolili. He became blind in 1939. He has elephantiasis of the right leg since 1931. Alfa lives at a house on Mende Street, where he has a room from Mr. Pridie, a Creole foreman at Delco. He is completely blind and walks about the streets with a stick feeling his way. He begs for food and clothing. He said that the blindness came on him in one month, which I find hard to believe, but his blindness is undoubtedly due to onchocerciasis. He has many onchocercal nodules; these do not hurt. Lenses opaque. Discs still visible.

He occasionally travels to Freetown. He once went to see a missionary, who claimed to be able to make the blind see. Alfa begged in Freetown in 1941 when the troops were there and must have made a good thing out of it because he speaks of it with pleasure.

Amadu Kamara. Aged 50 years. Temne

This well dressed man lives at No. 8 Bai Rampa Road in a house he owns himself.

Two years ago he developed Parkinsonism suddenly. He was involved in a mammy-wagon accident four years ago

when the lorry turned over. He was uninjured but one man was killed. The shaking started in the little finger of the right hand and became worse so that the whole of the right side became affected. In spite of his disability he walks quite well. He is subject to remissions.

He was a farmer with his own rice fields, but now he is unable to work and his two sons work for him, so he is well cared for. The sons are able to sell rice so that there is money for clothing and other things.

Apart from the shaking, he has attacks of dizziness, his head turns and he has pains in the right shoulder.

These last two cases show the differences between a man without a family and a man with strong family supports.

Thus, to summarise, the grossly defective do not survive, the defectives who can fend for themselves do so as do other handicapped unless they have strong family supports.

In Lunsar, and the villages, the whole community shares in the care of the mentally deranged and handicapped. Everyone has to listen to their ravings and give a small amount of money or food for the upkeep. This common sharing is a feature of African life which differs from the specialisation of urban life in the West, where the handicapped are supported out of taxation. Even in Freetown and the great cities of the Orient the people have this direct experience of sharing the burden of the less fortunate.

### 7.7. Conclusion.

The assessment of the health status of Lunsar in practice resolved itself into a Sample Census and general health survey of the town. Indices of vitality and health, external and social environment, and public health activity were calculated.

The method evolved of taking a valid sample of a fair sized town about which very little was known and thus getting base line data with which other areas may be compared, has been shown to be practicable.

To judge from the results of the clinical survey the effect of urbanisation would appear to be favourable in Lunsar. This is the reverse of what one anticipated coming from a western industrialised country.

Lunsar has grown up on its own, outwith the control of the mining concession and it might have been anticipated that conditions would be unfavourable. However, the rates seem to indicate that the urban occupied group have a more favourable experience than the rural occupied group.

Housing in Lunsar is of a higher standard than that of much of Sierra Leone. The town is well spaced out, the gardens are cultivated by the townsfolk. Family life has been altered only a little in transference from the village to Lunsar. The water supply is small, but fairly constant. A variety of foods are available in the market.

Simple medical and nursing care is available. The hours of work and conditions of work, wages, etc., are satisfactory by standards of the country and are approved by the Trade Unions.

At the conclusion of a survey of this kind it may be useful to make an assessment of the kind of data that can be effectively collected.

Referring to the Health Indicators mentioned at an earlier stage it will be seen that in Indices of Vitality and Health, Section A on Demography has been well covered. Section B, Mortality, is more difficult to collect, but the data for the infants is probably quite reliable. Section C, Morbidity, rates for some diseases and some physiological measurements have been gathered.

In the part on Indices of Environment a fairly complete picture has been built up of the External Environment. Also certain data have been given on Indices of Public Health activities.

The purpose of this research was to "ascertain how the mine has affected the health of the local tribal population" and the results of the survey have indicated that this is favourable and it has also given a baseline for further work in the area.

#### 7.8. Summary of the study of the urban community.

1. This section describes a study on the effect on health of urbanisation in Lunsar, Sierra Leone, using

sampling techniques and health indicators.

2. Data collected in preliminary studies are described.

3. The Lunsar Health Centre Records, Birth and Death Registers, and Burial Record Book were examined and found to give data which were unreliable for use or modification in assessing the health of the town.

4. A 10% sample Census of Lunsar was carried out, and the extracted data were discussed.

5. A 40% Clinical Sample of the Census Sample was drawn and a total of 380 persons were examined clinically. The extracted data were analysed.

6. Using morbidity and survival data as indices it was found that the 'urban' part of Lunsar's population, namely that section living on a wage packet, was better off in respect of those indices than the 'rural' section of the community.

7. Data were also collected on environmental conditions such as housing, including overcrowding, water supplies and disposal of excreta.

8. The mentally and physically handicapped persons in Lunsar were discussed.

VI. CONCLUSIONS

A. Introduction

During the first phase of the project, efforts to identify and describe the health status of the population of the Tuya-Tsamba District, the present study has been held.

This experience, together with the observations collected in other parts of the country, has provided a mental abstract picture of the health status of the population of the Tuya-Tsamba District.

**PART II.**

At the end of the first phase of the project, the health status of a village of 1,200 people was described. It was found that the health status of the village was poor. The main causes of the poor health status of the village were the lack of clean water, the lack of adequate housing, and the lack of adequate sanitation.

Because many people in the village were ill, the health status of the village was poor. The main causes of the poor health status of the village were the lack of clean water, the lack of adequate housing, and the lack of adequate sanitation. The population of the village was small, and the health status of the village was poor. The main causes of the poor health status of the village were the lack of clean water, the lack of adequate housing, and the lack of adequate sanitation.

## 8. Villages Survey.

### 8.1. Introduction.

During the first phase of the project, visits to several villages had been made and on one occasion (14th October, 1959) - a census of Romende had been taken in the Buya-Romende Chiefdom, and a medical clinic had been held.

This experience, together with the information gathered in Lunsar about the social, medical, and environmental characteristics of the Temne tribe enabled a confident approach to be made to the problem of estimating the health status of the villages. The material required for comparison with Lunsar had been defined.

At the outset it was not known how long it would take to examine a village of a given size and I planned to do at least three. It was found possible to cover four villages working intensively in the available time making a total of over a thousand persons.

Because many people in Lunsar had come from villages the similarities between villagers and townsfolk were known but the differences were not clear and although, for example, the population structure of Romende differed markedly from that of Lunsar in sex and age distribution, the population of the villages to be examined could not be foreseen, nor was it certain that they would have similar

population or disease patterns.

For this reason it was desirable to see as many villages as possible in order that variability might be allowed for.

During the process of examining a village, care was taken to ensure that all relevant data was collected at the time. Blood films were read when the other data had been collected and the material for each village checked to make sure that all raw data was complete.

Separate notebooks were kept for each village so that the source of information was precise. The method of survey and the desirability of taking several villages for study necessitated that much of the material which follows in this section will be repetitive. The four villages are described separately for comparison and then the material is combined. It will be appreciated that there is no valid alternative to setting out the data in this way.

The village study was carried out in order to be able to compare levels of health in villages, with each other, and with the town of Lunsar, using similar rates as indices.

For this purpose, villages had to be selected for study and total populations of these villages examined, if possible.



It was important to select villages in the region of Lunsar, situated on similar terrain with a similar climate, having predominantly Temne populations occupied almost entirely in rural pursuits, and that some inhabitants of these villages should have migrated at various times to Lunsar. The criteria of selection will be described later.

All the four villages studied lie in the Port Loko District of the Northern Province within a radius of twenty miles from Lunsar. They are situated at an altitude of about 250 feet above sea level and are in the region of closed forest lying on laterite soils. Although selected for different reasons in fact, they are all situated on Precambrian Marampa Schists which is the iron ore bearing geological structure of the region.

The climate of the area is the same as that already described for Lunsar.

The total populations of the three villages and a half sample of one village were examined. Census data, clinical findings and fertility and survival data were collected according to a schedule. From the combination of these, rates of morbidity and fertility were used as indices of levels of health, and it was found that the village levels were in almost all respects lower than those of the town of Lunsar.

In addition to such numerical data much information concerning village ecology was collected and has been described.

When one is working in an area such as this, where basic information on many aspects of epidemiology, medicine, tribal life and other features are completely deficient, the observer is bound to have his attention drawn to problems which would, indeed, make the basis for a research project on their own account.

It should be remembered that this study was intended to assess the effect on health of urbanisation and I have tried neither to be side-tracked nor to ignore the opportunity to gather information which may be of use to the University of Edinburgh joint project.

If the reader feels that important information has been omitted, the nature of the medical assignment should be recalled.

It should be noted that the villages were studied in January - March 1961. (See Appendix, Project Time Table). This is the dry season in Sierra Leone and is the time of the year when the harvest is in. Thus the villages were being examined at the optimum time of the year from the point of view of nutrition.

The dry season was chosen for the villages survey because travelling is so much easier at this time of the

year. In the rainy season, rural travel may become impossible.

### Village Life.

Life in the villages is much more peaceful than in the town of Lunsar. There is little noise during most of the day. Occasionally hammering on a building may be heard, but as most construction is done by lashing the wooden framework, this is comparatively rare. The dogs may occasionally set up a chorus of barks as the monkeys raid the fruit gardens.

The noise of the arrival of a "Mammy Wagon" is the signal for a group of people to gather for talk, news and commerce.

A large amount of time of the elders of the village is spent in discussion. This may be on a verandah of the Chief's house or in the Barri or court house. Elders also go to the Barri of the Paramount Chief for more formal sessions when cases are tried. Litigation is a popular way of passing time.

One of the main causes of litigation is woman damage. The fine for this offence at Masimera was £5.1. -d, the payment being made to the woman's husband.

A woman would only complain, so it was said, if she had not been paid enough for her favours. £3 - £5 is the usual amount. Prostitutes or "Rally Girls" do not live

in villages but they come to the largest villages, when there is some sort of celebration going on.

The curtsey of the Temne women and girls to an important person is only seen in the villages. Women may greet each other in this way. The woman goes down on her left knee and extends her hand to shake.

Much of the hard work of the village is done in the fields at some distance away so that the sight of people lazily lying about in hammocks or sitting talking in a village can give an entirely erroneous impression.

This is especially true of preparing the land for swamp rice, or cutting the palm oil bunches from the trees. A considerable physical risk is attached to the latter task. Many times villagers were seen to return to the village covered in sweat and worn out with physical effort. Much of this physical work is done in unison and Africans work better in a rhythmic way.

In a village, everybody in a lineage has a right to land. Trees belong to families or to the chief or the public. Mango trees are common property and anyone may take the fruit.

At various times of the year ceremonies take place. The Poro and Sande Societies are active at the slack farming period so everyone can participate in any ceremonies, processions or dancing that may occur, without them

conflicting with farming operations.

Most villages have a Boromme Saar - a small thatched house where the stones representing the ancestors are kept. These stones are thought to contain the spirits of the founders of the village and they are consulted before any important action is taken.

An important part of village life is centered upon the cooking fires and kitchens. Here the food is prepared and cooked. The babies are bathed and cared for. The women gossip and the children play or help in household tasks such as pounding rice, winnowing, fetching wood or water. The old women keep an eye on the infants and may crack palm kernels or do other household tasks as they sit.

## 9. Selection of Villages

As soon as I had moved into the Mining Compound of the Sierra Leone Development Company by the courtesy of the General Manager, Mr. W.L. Muir, I got my team together and started to look for suitable villages for study.

The team was made up in a similar way to that which carried out the Lunsar Survey.

I was fortunate indeed that the Mining Company gave Mr. Anthony Opoku permission to work with me again, and, as in the Lunsar Survey he performed the skin biopsies for onchocerciasis and took the blood films for malaria.

I was also fortunate in being able to have the services of the interpreter who worked with me on the first occasion, Mr. Alfa Kabia. Mr. Kabia is most competent and helpful and he had an excellent grasp of the sort of data we were looking for. The dispenser, Mr. Momoh Kamara, was seconded to the team by the kindness of the Chief Medical Officer, Dr. H.M.S. Boardman.

My old steward, Mr. Abdulai Konteh made up the fifth member of the team. He looked after our needs in the field, acted as deputy interpreter and having been attached in the past to a District Commissioner was a source of much information about Sierra Leone.

The selection of villages for study was carried out in the following manner.

I explored villages in an outward direction from Lunsar, towards the southeast, the north and the west. (See Map 2). To the south, Rogbanay, Morea, Magberi and Katik on the Rokel River are all functionally part of the mining concession.

As this area is under sanitary control by the Endemic Diseases Control Unit of S.L.D.C. the villages would be atypical both because of their hygiene and also because these villages are mainly occupied by labour at the mines.

The road running towards the east turns south to cross the Rokel River and this road was followed as far as Masimera on the south side of the river. The villages are Tindata, Magbenkiti, Mafoki, Magbile, Marampa and Mawulay-Mamanso at the ferry. Of these only Mawulay-Mamanso is outside the control area of the Endemic Diseases Control Unit, and the first four villages have many inhabitants who commute to Delco daily.

To the west, to the Port Loko junction and Freetown road are Rogbera, Royenkesa, Rolal and Magbele. Magbele used to be quite an important place on the Rokel River for water borne traffic but it has decayed. None of these villages to the west seemed suitable as they were all small and were very much involved with traffic along the main road.

To the north, on the Makeni road from Lunsar were Mabesene, Makump, Matoko, Maramp, Karefe then Foradugu at the junction with the Old Makeni Road. On the new Makeni road further on, lies Romende where I had worked during my previous stay.

On the old Makeni Road travelling north are Rogbarr'an, Robumba, Robaile, Rosint, Robuya and Kamasundu at a distance of about 18 miles from Lunsar.

As far as Matoko on the Makeni road seemed too near Lunsar, and the villages were all quite small.

On these visits I stopped at each village and made enquiries about commuting with the S.L.D.C. mines and also noted the number of houses. From previous experience one can estimate that there are about 8 persons to a house so that the population of the village can be roughly calculated.

The first village to be selected was Masimera and experience gained during the work there was used to help in selecting the other three villages, Kamasundu, Mawulay-Mamanso and Foradugu. It was found that an average of about 25 persons daily could be seen so that a total sample of about a thousand could be envisaged.

The factors involved in selection of the villages can be listed as follows:-



1. The villages to be studied should lie in the same geographical and climatic region as Lunsar.
2. They should not be more than 20 miles away from Lunsar. This was because it was intended to do the surveys from the Marampa mines base going out and returning daily.
3. They should have much the same sort of tribal composition as Lunsar, that is, predominantly Temne.
4. The village should be the birthplace of persons who had migrated to Lunsar.
5. The villagers should not commute with the Sierra Leone Development Company mines.
6. The village should be engaged in agriculture.
7. The villages should be at varying distances from the Rokel River, a major breeding place of *Simulium damnosum*, the vector of onchocerciasis. The reason for this condition was that onchocerciasis was to be used as one index of health and it was hoped that by varying the distance from the breeding places a more accurate assessment of the overall incidence of the disease would be made.
8. The villages should not be too small because

in small villages it is difficult to get an even distribution of the population.

9. The villages should be old established.
10. Only Africans should be inhabitants of the village.
11. The village should be willing to have the team do a survey.

During the course of selection of villages for survey, it was realised that to get a suitable village far enough away from the Rokel River in the Marampa-Masimera Chiefdom would mean very long journeys each day by road. A suitable village, Kontakuma, for example, although only 14 miles away from the river was 68 miles by road from Lunsar. Hence it became necessary to move to another Chiefdom. It was fortunate that I had previously met Paramount Chief Bai Fonte Gbangba II when working at Lunsar so I went to see him to ask permission to work in his Chiefdom. This was granted so that two villages were selected from his Chiefdom and two from Marampa-Masimera.

The explanation of what I was doing was as follows:-  
"I have come to study the health of the people in Sierra Leone. I wish to see everyone in the village whether sick or well. Those who are sick will be given the appropriate medical treatment. The well will be examined so that I can find out standards of health among

the people. The information I ask about households is required in order to see if the houses are overcrowded. I ask about village commerce and food because lack of the right food and lack of the ability to grow it or pay for it is a major problem in this part of Africa.

I do not work for the Government nor for the Mining Company. I am not concerned with the collection of taxes or military service. I come from the University of Edinburgh in Scotland and my interest is entirely in the health and welfare of Africans."

## 10. Method of Procedure in Villages.

On arrival in a village the Chief and notables were greeted and explanations of the survey methods were given. The village Chief was asked to arrange for a house to be used as a clinic for the survey. Usually a verandah was used with an adjoining room in which to make examinations requiring undressing. At Masimera a shimbek was allotted for clinic purposes. This consisted of a palm leaf structure which had been constructed to accommodate visitors for the coronation celebrations.

Some water had also to be made available and usually basins of it were provided by the village.

Confidence must be established as quickly as possible if the delays are to be minimal.

### 10.1. Mapping.

Once a village had been chosen and the Chief had given his orders for the arrangements, the village was mapped.

The sketch plan made gave the layout of the village and showed each "inhabited house" numbered on the plan. The sketch plan is an important means of locating the domicile of any given person in the village, since every house has a Head, and houses have neighbours so that duplication of names, very common in Temne society, does not lead to wrongful allocation. Any given house can thus be selected for special purposes. With the sketch

plan made and houses numbered on the plan it became easy to identify an inhabited house by number of house, and name of head of household. When sampling is done, as at Lunsar and Foradugu, the map is an essential part of the technique.

#### 10. 2. Housing and Population.

All houses were then listed in order and the structure described including latrine accommodation, water supply and other factors, according to the schedule (See Appendix).

Each house was visited and the head of house questioned. If the head of the house was not present the residents usually refused to give information either until the head of the house returned or his deputy had the proper authority. The number of residents as given by the head of the house was put down as the estimated total number of persons in the house, and the head estimate for the number of separate Family Units was taken without making detailed enquiries as to the composition of a Family Unit. The kinship groupings making up what the Temne consider to be a "Separate Family Unit" are complicated and are being studied by Littlejohn.

The children of a marriage belong to the father but the woman always has stronger links with her own parents although she may live in the same house as her husband.

When the data regarding housing had been collected and an estimated total population calculated, the clinic

was set up and the clinical survey commenced.

### 10.3. Sampling.

The clinic was usually set up on the verandah of a house. The doctor sat at a table accompanied by the interpreter. At a second table the laboratory assistant had his microscope and equipment and at a third table the dispenser had the dressings and medicines set out.

The households were called forward in order, one by one or in groups depending on their estimated size. The head of the house was seen first and then he sat by the doctor and indicated the members of his household and he attended during the examinations.

This was found to be a much better method of getting the sample than by asking persons to come forward as they liked. This was tried in the beginning at Masimera, the first village to be examined. As each person came forward he was allocated to his household group on the list so that when the actual number of persons seen equalled the estimated number of persons in that household, questions could be asked regarding the total numbers expected to be seen, comprising the household on that day. It was soon realised that the household method was preferable and it was applied later on at Masimera.

This method was not too rigidly adhered to because some persons or households wished to be seen before others, for example, in order to go to the fields. Also, sick persons were brought forward at any time. In any case it is difficult to organise rural Africans and flexibility must always be possible and infinite patience exhibited. It is a mistake to exhibit impatience or annoyance because most of the people do not understand what is going on and their confidence is easy to lose. This does not mean that normal human emotions should not be exhibited, on the contrary, Africans of all types feel more sympathy for, and understand more easily a man who looks like a man and behaves like a human being. Africans enjoy eating, laughter and dancing and these are activities in which a foreigner can share and his prestige will certainly be enhanced if he accepts this naturally.

In a village survey of this nature, the problem the field worker faces is how to see every person in the village.

In practice, this can be achieved most efficiently in the manner which has been described and can be summarised as follows:-

1. Call forward all persons in households.
2. All sick persons from anywhere at all must be seen otherwise they will pretend that they come from the village being examined and bias the sample. It was the

practice to hold a general clinic at the end of the day's quota for the clinical sample, when all comers were seen and treated. Urgent cases of illness were seen at any time even interrupting the routine. There is no way of avoiding the extra work involved by seeing the sick from any quarter. There is also an ethical obligation on a doctor to give medical help in the area in which he is working since no alternative medical care is available and since it is difficult to draw a demarcation line between the very sick and those who could travel some distance to get medical care, it is best to see everyone who wishes to be seen. There is no doubt that this attitude on the part of the doctor creates much goodwill.

At Masimera, the first village surveyed, many persons were visitors because of the Chief's coronation and at the start many pretended that they were inhabitants of Masimera and indeed resident in certain houses. Since this was not denied by the Head of the house, the subject was put through the whole of the clinical examination. Later when greater familiarity with the villagers and their organisation had been achieved it came out that certain persons did not, in fact, belong to the sample. It can be understood how wasteful and time consuming this occurrence can be. There was thus a considerable spoilage rate of schedules at the beginning but this was



overcome by insisting that every person, from any place who wished to be examined would be seen if he would honestly say where was his true domicile. With this experience the wastage rate was later reduced to zero.

Six persons who should not have been on the list were put through the full examination to Masimera and one at Kamasundu. The team became skilled at spotting persons who were not bona fide villagers from the village being examined.

#### 10.4. Clinical Examination.

This was carried out in a similar manner to the Lunsar survey. Certain modifications were made and these will be described.

Each person was seen separately, interviewed and then examined. Babies and infants were seen with one or both of their parents.

As much of the examination as possible was done with the subject sitting in a chair and this included the taking of blood film, haemoglobin estimation by the Tallqvist scale, and also a skin snip. The latter was taken at the outside of the upper part of the leg. In this position the skin is loose and the skin snip easier to perform and less disturbing for the subject. For the parts of the examination of abdomen and pelvic girdle, which could not be performed in public, the subject was

taken to the adjoining room and examined in the upright posture for spleen and onchocercomata. A bench was available if the patients were required to lie down. In the case of females another female was always in attendance.

It is noteworthy that no person coming to the clinic ever refused examination. Women frequently giggled and thought it all a joke but none refused examination.

Another striking feature was the calm way in which almost all persons including children, submitted to a finger prick for the blood film and haemoglobin estimation and a skin snip for the diagnosis of onchocerciasis. As at Lunsar, and in the villages all children were given a sweet at physical examination. Blood films were stained daily, on returning from the villages and read on completion of the work in the village.

The schedule used in the villages (See Appendix) was similar to the one devised for Lunsar with certain modifications. Notable is the combination of basic civil data to be taken at the same time as the clinical examination. The addition of questions on sight and Venereal Disease and an elaboration of the questions for Fertility and Survival were improvements on the previous layout.

#### 10.5. Census Data

(a) Name. The name of the person was taken and he

was given an index number. The address was given by name of Head of house and house number according to the village plan. If the name of the Head of the house was the same for more than one household then the number from the plan served as identification. The manner in which the Temne change their names has already been discussed but this was not such a problem in the villages as in Lunsar.

(b) Age. The age of the person was estimated. I consider that the accuracy of the estimate is approximately as follows:-

6 months	to within 1 month	$\frac{+}{-}$
1 year	to within 2 months	$\frac{+}{-}$
- 4	to within 4 months	$\frac{+}{-}$
- 9	to within 1 year	$\frac{+}{-}$
-20	to within 2 years	$\frac{+}{-}$
-30	to within 3 years	$\frac{+}{-}$
30+	to within 5 years	$\frac{+}{-}$

There are various checks on ages that can be used in cases of doubt:-

1. Dentition in children

The eruption of particular teeth may be a guide to a person's age. Teeth of the lower jaw precede the corresponding teeth of the upper jaw.

The times of eruption may be variable but for particular purposes may be taken as follows:-

Temporary Teeth

Incisors	6th - 12th month
First Molars	12th - 14th month
Canines	14th - 20th month
Second Molars	20th - 24th month

Permanent Teeth

First Molars	6th year
Central Incisors	7th year
Lateral Incisors	8th year
First premolars	9th year
Second premolars	10th year
Canines	11th year
Second molars	12th year
Third molars	17th - 25th year

2. Ages of children from one mother are rarely nearer together than 2 - 2½ years. This is because of the intercourse free period which follows the birth of a child and its subsequent weaning. The husband does not have intercourse with a wife who is breast feeding an infant since it is considered to stop the flow of the milk and kill the child. Since in Temne Society the children belong to the man this relationship is very

important, and hence the tabu is not likely to be broken.

3. Female children may become married at an early age but they do not cohabit with their husbands until they are about 15 or 16. The two youngest married females were aged 12 in Mawulay-Mamanso, and 14 in Masimera compared with 3 of 9, 10 and 14 years, in Lunsar. From 15-19 years, 19 out of 24 (79%) females in villages were married and at 20 and over, all were married or had been married.

All females under 15 were childless and the 19 married women in 15-19 age group had only 7 live births, 1 still-born and 1 abortion.

The oldest females to have a child within the last year were one aged 45 from Mawulay-Mamanso and one of 46 from Kamasundu.

A woman may be judged to have a certain age which has to be re-assessed after the details of her obstetric history have been taken down and the ages of her children have been estimated. The children's ages were subtracted from those of the mother to estimate age at maternity. The general trend was to underestimate the ages of adult females.

In estimating ages it was found to be useful to get the subject to remove the headdress. Men must be requested to do this, but it was not considered undig-

nified if the doctor removed the woman's headtie.

The frequency of the digit endings of ages 15 and over were extracted for males and females (See Appendix). There was a marked preference for zero and 5, with some preference for even numbers, and especially 8, among both males and females.

The method of grouping ages used in the survey ensures that the zero and 5 preference are correctly allocated.

Some children appeared to have retarded growth. They looked about  $3\frac{1}{2}$  years but turned out to be 5 years. This was especially noticeable at Kamasundu.

(c) Birthplace

Persons stated their birthplace readily enough. It should be noted, however, that repetition of place names is extremely common in Sierra Leone, as a glance at a large scale map will show. This means that unless a lot of time is spent over this item it is not possible to be precise about which Petifu, for example, is meant, in which Chiefdom it is situated, and how it is related to its neighbouring villages.

For the purposes of this study greater precision than a simple statement of the name of the birth place was not considered necessary.

(d) Civil State

The people had no hesitation in stating their civil state but the implications of the words, married, divorced

and separated are not the same in Temne society as in the Western world, and the translation from one society to another culture should be done with caution.

Littlejohn (1954) has discussed this and these problems are being investigated by him.

(e) Occupation

Many persons had more than one occupation as is frequent in many communities. "Farmer" Farming dominates village life and most persons gave this as one of their occupations. Most women would state that they were farmers and only say that they worked in the house if questioned. Farm work takes priority in these communities hence this precedence. Very small children frequently gave their occupation as farmer because they are employed driving the birds from the rice fields. Farming processes are described under "Agricultural Cycle" in the Appendix.

"House" Women who stated that their work was in the house were frequently the aged who look after the children, or the children who carried water and did other tasks.

Occupations around the house include gathering and preparation of food including parboiling and drying of rice, pounding and winnowing as well as cooking and serving.

The care of babies would take up some time but some sweeping is all the house tidying that is done.

Some young children and older females help around the house, carrying water, watching the children in the case of the old people.

"Trader" There are few traders compared with the town. The term includes shopkeeper, merchant and child trader, usually girls who sell nuts, prepared foods, etc., from trays carried on their heads.

"Industry" There is no industry in the villages studied to compare with that of the Sierra Leone Development Company mines. In the villages the term was used to include two groups of persons, those who made articles for sale such as fish nets or dyers of cloth, and those who worked for the Government in one of its branches and thus receive salaries or wages. The groups are separated in the tables.

A list of village occupation and industries is as follows:-

	Number
1. Basket maker	2
2. Blacksmith - makes machetas, hoes, knives, adzes out of old car springs	1
3. Blacksmith's apprentice	3
4. Carpenter	3
5. Clerk Native Administration	2



6.	Court Messenger	4
7.	Diamond digger	1
8.	Dyer of clothes and raffia	6
9.	Ferryman	5
10.	Fish net maker	2
11.	Goldsmith - was temporarily in Masimera from Freetown	1
12.	Mat maker	2
13.	Midwife - Masimera	1
14.	Pillow and Head-tie maker	1
15.	Pottery	1
16.	Preparing food for sale	1
17.	Public Works Department Overseer	1
18.	Snuff maker	2
19.	Tailor	2
		<hr/>
		41
		<hr/>

The blacksmith's products are sold throughout the Chiefdom. Baskets, mats and fishnets are sold outside the villages where they are produced.

#### Village Officials

The Paramount Chief is the highest official it is possible to have in a village and only then if it is the seat of the Chiefdom as is the case in Foradugu, the Speaker is his ~~aid~~-de-camp and may undertake many of the Paramount Chief's Administrative duties.

The Section Chief is the Chief usually met in villages and he may be the shrewd, wise leader of the community or the puppet of the local politicians, the Headman is the leader of a village which is part of a section.

These positions are in addition to other occupations such as farming, as are certain ceremonial occupations such as "Crown of Chiefs", "Chief's Messenger" and "Digba" - an official in the Sande Society.

#### Salaried Officials

Some villages have a resident Clerk to the Native Administration, Foradugu having both a Clerk and an Assistant Clerk.

Court Messengers or Chiefdom police may also be resident, and Foradugu has a health inspector.

These officials in this group are paid staff of the Chiefdom and since they are in receipt of a salary they are listed under "Industry" in the census data.

#### Religious Leaders

In none of the villages studied was there a resident priest but Kamasundu has an Imam and all villages have Alfas. The Imam is the leader of the Muslim community and is the officiating priest of the Mosque, the Alfa being the teacher of the Koranic School. These Alfas are included in the heading "Arabic School".

"School" There are two types of schools in the villages. Mission schools run by the Roman Catholic Mission, and the Koranic (Arabic) schools run by the Muslim community. If a person had attended or was attending school this was noted on the schedule. Attendance at the Koranic school was also noted. Some children had attended both schools. If "school" only, was given as occupation it meant that the child was at the Mission School. Mission schoolchildren do not work at anything else but pupils of the Koranic Schools frequently work on the land of the teacher, the Alfa or the Imam. There were Roman Catholic Schools at Masimera and at Foradugu.

(f) Tribe

This was readily stated by all persons. Children born of mixed tribal marriages consider themselves as belonging to one or other of the tribes of their parents.

(g) Literacy

Literacy means the ability to read and write English.

Literacy in the Temne language is of little practical use as there is no literature and few translations into the Temne language.

Arabic is learnt at the Koranic Schools in so far as Koranic phrases, inscribed on boards by a hot iron, are recited by children until the phrases are learnt by heart.

In spite of this, these pupils are unable to recognise the Arabic characters.

Many persons who claimed to read and write Arabic were shown an Arabic script but were unable to point out the letters, or read a simple phrase or reply to a simple question in the Arabic tongue. Literacy in Arabic is rare. It occurs only among those who have studied the language at an institution other than a Koranic school. Arabic has little use or relevance in West Africa for other than religious purposes.

#### (4) Religion

Persons stated their religion without hesitation. I had been told that some were reluctant to admit to being Pagan, and that many would say that they were Muslim in much the same way as many persons in Britain would state that their religion was of the established church in order to avoid discussion and precision in the matter. In fact, persons stated their religion quite freely, one woman saying that she was a Pagan having given up being a Muslim and praying, since the death of her child.

#### (i) Length of stay in village

Data on length of stay in the village were only taken at Foradugu. It had been noted that in villages a high proportion of the inhabitants were living in the village

of their birth. It was considered that owing to Foradugu's situation at the junction of main roads and its rapid growth more movement of population would be occurring. Data were therefore collected in order to measure this movement. The figure given for length of stay is an approximation only. Many Africans move about a lot to different parts of the country and they find it difficult to say how long they have actually lived in one place, especially if they have been away for periods and later returned.

11. Villages Survey.

In three of the four villages studies, total populations were examined. In Foradugu, a half sample was taken.

The Clinical Schedule form (See Appendix) for the villages contains more items dealing with census data, as well as clinical and survival data, than does the Clinical Schedule for Lunsar.

This is because the Census data was collected concurrently with the physical examination in the villages and was not undertaken as a separate operation as had been the case in Lunsar.

11. 1. MASIMERA.

Situated in the Marampa-Masimera Chiefdom, Port Loko District of Northern Province.

Masimera is a village of approximately 240 persons situated south of Lunsar across the Rokel River at a distance of 11 miles by dirt road. The village is  $1\frac{1}{2}$  miles south of the Rokel River which is crossed by means of a man-powered vehicle ferry. The river is about 200 yards across at this point. From the mines of the Sierra Leone Development Company the distance on foot via Mafoki village is 7 miles. The road from Lunsar, having crossed the river, ends at Masimera.

Masimera was chosen because:-

1. It was the stated birthplace of 15 persons in the Lunsar clinical survey. 3 persons were between ages 0 - 9, and 12 persons 10 years or over. Persons have thus migrated to Lunsar from Masimera.
2. The village is too far from the S.L.D.C. mines for daily commuting especially as the river has to be crossed by ferry or canoe.
3. The village is entirely agricultural but exports its products to nearby markets. Only Africans live in Masimera.
4. It is near the Rokel River, a known breeding place of *Simulium damnosum*.

Section Chief - Bai Yola.

Clerk to Native Administration resident in village,  
P.M. Kanu.

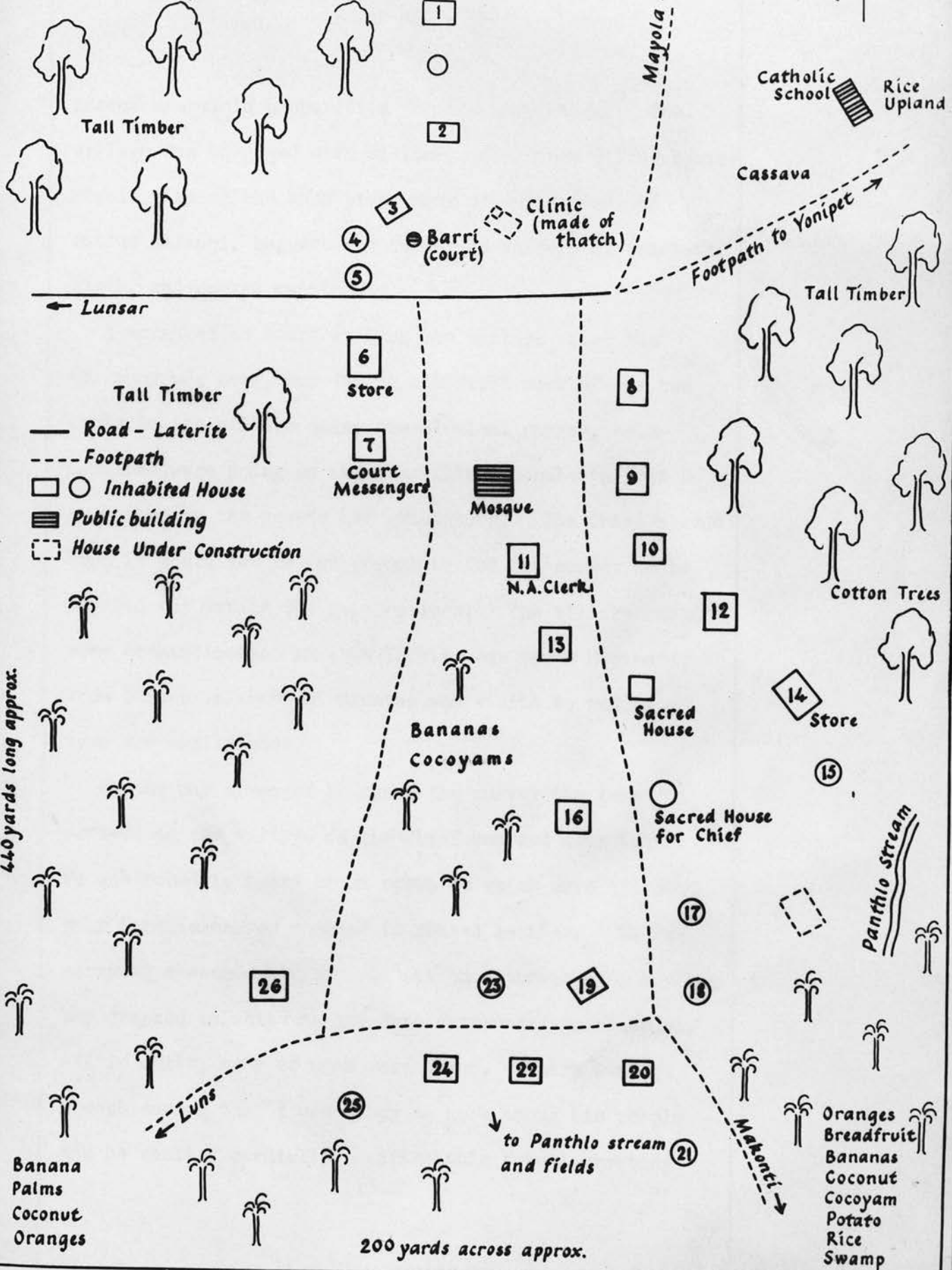
MASIMERA is situated on sloping ground with a ridge down the north side at the foot of which runs the Panthlo stream, the source of water for the whole village. This stream joins the Batcheri which later runs into the Rokel River. The ground slopes towards the west and the village is surrounded by gardens and fields with some tall stands of timber.

At the time of my first visit to the village, the Chief designate, Bai Yola was in Kanta, seclusion in a

# MASIMERA - SKETCH PLAN

9th January 1961 A.R. Mills

 Rest House (demolished)





sacred house, in preparation for his coronation. The village was thronged with visitors from other villages, minstrels playing the bush piano made of calabashes and called Balangi, beggars and itinerate vendors of trinkets, cloth, and cooked sweetmeats.

I arranged to start working the village after the ceremony was over, but during the first week of the two weeks in the village doing the clinical survey, celebrations were going on and the village population was augmented by the guests and spectators. The Chief agreed that it would not be inappropriate for the survey to be carried out during the celebrations. The village has some sophistication in that lorries can reach Masimera from Lunsar in about 45 minutes and visits to and from town are easily made.

On the day arranged to start the survey the team arrived in the village as the Chief emerged from Kanta. He was robed in heavy brown robes to which were attached many Koranic charms encased in chased leather. He was carrying a sacred staff. He sat on a throne with a young boy dressed in white at his feet surrounded by notables, all in white, many of whom were women. I made a short speech saying that I was happy to work among his people and he replied cordially. After this formal greeting

the work started. It was noticeable that the ceremonial was well dressed and this is undoubtedly related to the wealth of the community. It would seem to be typical of this part of Africa that often considerable sums of money are available or earned, yet basic living standards, e.g., housing and nutrition, are low.

The clinical sample taken in Masimera was a total sample.

No one from any household refused to come forward for examination. Two persons were so old or infirm that they were examined in their own homes. 12 Bundu girls between 5 - 14 years were away in the bush being initiated into the Sande Society. As such girls are tabu to men they cannot be examined.

The sketch plan shows the general layout.

The village has a Barri - native courthouse, a Roman Catholic School, a mosque, three Kanta - sacred houses, and two shops.

#### 11.1.1. Housing.

There are 26 houses in Masimera, taking a "house" to mean the main building together with its adjacent outhouses, frequently used as stores or additional rooms. 25 are used as dwellings and one as a store. 8 (31%) of these houses are of the traditional round shape, and

18 (69%) are rectangular, 4 (15.3%) houses are rented and the rest owned by the occupiers.

18 (69%) of the houses are constructed of mud and sticks with a thatched roof and the rest have corrugated iron (pan) roofs. All the round houses are constructed of mud and sticks with thatch. 4 houses had concrete floors, and the rest beaten mud. The 26 houses have 134 rooms excluding kitchen, storerooms or toilet, or a mean of 5 rooms per house. 239 persons inhabited 25 houses with 132 rooms a density of 916 persons per house and 1.8 persons per room. The 239 persons formed 28 separate Family Units being 8.5 persons per separate Family Unit. There were 1.1 Separate Family Units per house.

#### Overcrowding.

In Masimera 6.3% of the population is under 1 year and 29.7% between 1 and 10 years. On the same basis as was used in Lunsar the numbers of inhabitants of the houses have to be corrected by a factor of 21% approximately.

5 houses out of 25 were found to be overcrowded, i.e., 20%.

#### Latrines.

There were 12 houses (48%) with deep pit latrines situated nearby, that is one latrine for every 20 persons.

Every house had an available food garden.

11.1.2. Water Supply is collected from the Panthlo stream.

11.1.3. Rubbish Disposal, is by burning or by putting it on gardens or burying, by each householder. Small cans of tinned milk which are quite popular are used to make small kerosene lamps, hence their disposal presents no problem. There were very few flies or mosquitoes seen but Simulium damnosum was biting occasionally.

11.1.4. Burial of the Dead. The dead are buried close to the houses either inside or outside.

11.1.5. Medical Services. A Government Midwife, Alica Kargbo, is resident in the village. She was trained at Port Loko Hospital, and is paid by the Native Administration.

Between 24th February, 1960 and 9th March, 1961, she delivered 8 male and 2 female children of inhabitants of Masimera. The midwife also visits surrounding villages for maternity care and women also come to Masimera to be delivered by her. She has no clinic but delivers the patients in their own homes.

The midwife keeps a Register, which she takes to Lunsar at the end of every month for supervision by the Senior Nursing Sister at the Lunsar Health Centre. She also collected her medicine at this time which comes from Port Loko Hospital. The Register of Delivery was started in February, 1960.

Register of Deliveries, Masimera  
1960

March	7		
April	13		
May	7		
June	6		
July	5	1 set male twins	
August	7	1 set female twins	
September	4		
October	8		
November	10		
December	11		
	<hr/>		
	78	37 M	41 F
	<hr/>		

The midwife stated that none of these labours had been complicated. Most people stay in the villages to have their babies. This is a different pattern from Lunsar. The midwife had not been visited by a supervising doctor at her station since the Yaws Team came two years ago. Sick Persons are taken to Lunsar Roman Catholic Hospital at Mabesene or Lunsar Health Centre and Marampa Mines Health Centre.

There are no beggars and no mentally deranged resident in Masimera. Beggars came into the village on the occasion of the Coronation and one was shouting praises

of the Chief for 15 minutes in order to get a large gift. Defective children are killed by smothering. This is done by a sacred person in the village. Defectives are allowed to live only three days at the most.

Everybody wants injections, especially adult males. This is probably the result of the activities of the Yaws Campaign. The results of penicillin treatment are so dramatic that the people think that only injections will cure disease.

#### 11.1.6. Shops.

There are two shops in the village, Foday Fofanah No. 6 and Pa Kapr Fenthi No .8.

Foday Fafanah is also a trader and buys and sells farm products. Articles on sale:-

#### Pa Kapr Fenthi

Onions	Sugar	Tined Milk
Oranges	Sweets	Tinned Fish - Pilchards
Bananas	Vimto	Wine
Salt	Beer	Tobacco and cigarettes
Dried fish - from Lungi via Lunsar		
Biscuits		
Kerosene	Carbide	Spoons
Soap	Matches	Lamps
Scent	Cotton thread	Shorts
Pins	Needles	Berets
Cloth	Combs	Umbrellas
Hats - embroidered, from Lagos, Nigeria		Mirrors
		Belts
Talcum Powder		
Sloans Liniment		
Casacara Sagrada		
Brilliantine		

Foday Fofanah

Stocks all the above and in addition:-

Cooking pots  
Candles  
Buckets  
Cycle Tyres  
Gym Shoes  
Cement

11.1.7. School A Roman Catholic Mission School

This is a two roomed corrugated iron building.

Martin Kanu is the Schoolteacher. There are 15 pupils in the school from ages 5 - 14. 10 of these are from Masimera. There are 46 children of these age groups in Masimera, thus only 21.7% of children attend school. There is a deep pit latrine for the pupils and water is from the stream.

The subjects taught are as follows:-

Reading	Religious knowledge
Arithmetic	Nature study
Writing - English	Story Telling
English Language	Drawing
Singing	Recitation
Crafts	Physical Education

There is health inspection for cleanliness. There is also a Koranic School.

11.1.8. Census Data. Masimera

This is set out in Tables 31, 32 and 33.

Population structure.

Females are more numerous than males, there being 128 (53.6%) out of a total population of 239.

Table 31

## CENSUS DATA, MASTIMERA

AGE	Civil State						Tribe						Occupation							Religion				Literacy		
	Persons	Single	Married	Widowed	Divorced	Separated	Temne	Mende	Fulah	Limba	Creole	Other	Born in village	House	Farmer	Trader	Industry	School	Koranic School	Child or none	Muslim	R.C.	Protestant	Pagan	Literate	Arabic
Under 1	12	12	-	-	-	-	11	1	-	-	-	-	9	-	-	-	-	-	-	12	12	-	-	-	-	-
1 - 4	21	21	-	-	-	-	20	1	-	-	-	-	16	-	1	-	-	-	-	20	18	-	1	2	-	-
5 - 9	15	15	-	-	-	-	15	-	-	-	-	-	9	1	15	-	-	2	6	-	13	-	-	2	-	-
10-14	8	8	-	-	-	-	8	-	-	-	-	-	7	1	8	-	-	-	4	-	8	-	-	-	-	-
15-19	5	5	-	-	-	-	5	-	-	-	-	-	3	-	4	-	-	1	4	-	4	1	-	-	1	1
20-24	4	2	2	-	-	-	4	-	-	-	-	-	3	-	4	1	-	-	1	-	4	-	-	-	-	-
25-29	8	1	7	-	-	-	8	-	-	-	-	-	5	-	6	1	1	1	2	-	6	1	-	1	1	-
30-34	2	-	2	-	-	-	2	-	-	-	-	-	2	-	1	-	1	-	1	-	2	-	-	-	-	-
35-39	12	1	11	-	-	-	10	-	-	2	-	-	6	-	9	-	3	-	2	-	12	-	-	-	-	-
40-44	3	-	2	-	-	1	2	-	-	1	-	-	2	-	2	-	1	-	1	-	1	-	1	1	-	-
45-49	10	-	10	-	-	-	10	-	-	-	-	-	10	-	10	-	-	-	2	-	9	-	-	1	-	-
50-54	2	-	2	-	-	-	2	-	-	-	-	-	1	-	2	-	-	-	1	-	2	-	-	-	-	1
55-59	5	-	5	-	-	-	5	-	-	-	-	-	5	-	4	1	-	-	-	-	5	-	-	-	-	-
60-64	3	-	3	-	-	-	3	-	-	-	-	-	2	-	3	-	-	-	2	-	3	-	-	-	-	2
65-69	1	-	1	-	-	-	1	-	-	-	-	-	1	-	1	-	-	-	-	-	1	-	-	-	-	-
70-74	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
75 plus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	111	65	45	-	-	1	106	2	-	3	-	-	81	2	70	3	6	4	26	32	100	2	2	7	2	4
Per cent		58.6	40.5	-	-	0.9	95.5	1.8		2.7			73.0	1.8	63.1	2.7	5.4	3.6	23.4	28.8	90.1	1.8	1.8	6.3	1.8	3.6



Table 32

## CENSUS DATA, MASIMERA

## FEMALES

Age	Persons	Civil State					Tribe						Occupation							Religion				Literacy		
		Single	Married	Widowed	Divorced	Separated	Temne	Mende	Fulah	Limba	Creole	Other	Born in Village	House	Farmer	Trader	Industry	School	Koranic School	Child or None	Muslim	R.C.	Protestant	Pagan	Literate	Arabic
Under 1	3	3	-	-	-	-	3	-	-	-	-	-	3	-	-	-	-	-	-	3	3	-	-	-	-	-
1 - 4	19	19	-	-	-	-	19	-	-	-	-	-	13	1	-	-	-	-	-	18	18	-	-	1	-	-
5 - 9	16	16	-	-	-	-	16	-	-	-	-	-	12	5	8	1	-	3	-	5	12	2	-	2	1	-
10-14	7	6	1	-	-	-	7	-	-	-	-	-	7	3	5	2	-	4	-	-	4	2	-	1	2	-
15-19	3	1	2	-	-	-	3	-	-	-	-	-	2	3	2	1	-	-	-	-	3	-	-	-	-	-
20-24	19	-	18	1	-	-	19	-	-	-	-	-	9	17	17	4	-	-	-	-	13	-	-	6	-	-
25-29	15	-	14	1	-	-	15	-	-	-	-	-	10	9	14	-	-	-	-	-	13	-	-	2	-	-
30-34	9	-	8	1	-	-	9	-	-	-	-	-	6	6	8	2	-	-	-	-	9	-	-	-	-	-
35-39	6	-	5	1	-	-	5	-	-	-	-	1	3	5	5	1	1	-	-	-	4	-	-	2	-	-
40-44	5	-	5	-	-	-	4	-	-	-	-	1	2	4	4	-	1	1	-	-	4	-	1	-	1	-
45-49	10	-	10	-	-	-	10	-	-	-	-	-	6	10	9	3	-	-	1	-	9	-	-	1	-	1
50-54	4	-	4	-	-	-	4	-	-	-	-	-	2	1	4	1	-	-	1	-	4	-	-	-	-	-
55-59	4	-	-	4	-	-	4	-	-	-	-	-	2	2	4	-	-	-	-	-	4	-	-	-	-	-
60-64	4	-	2	2	-	-	4	-	-	-	-	-	4	3	3	1	-	-	-	-	4	-	-	-	-	-
65-69	2	-	-	2	-	-	2	-	-	-	-	-	2	1	-	-	1	-	-	-	2	-	-	-	-	-
70-74	2	-	1	1	-	-	2	-	-	-	-	-	1	2	1	-	-	-	-	-	2	-	-	-	-	-
75 +	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	128	45	70	13	-	-	126	-	-	-	-	2	84	72	84	16	3	8	2	26	108	4	1	15	4	1
Percent %		35.2	54.7	10.2	-	-	98.4	-	-	-	-	1.6	65.6	56.3	65.6	12.5	2.3	6.3	1.6	20.3	84.4	3.1	0.8	11.7	3.1	0.8

Table 33

## Census Data, MASTIMERA

MASTIMERA

TOTAL

Age	Persons			Group as % Total	Civil State					Tribe					Born in village	Occupation							Religion				Literacy		
	M	F	T		Single	Married	Widowed	Divorced	Separated	Temne	Mende	Fulah	Limba	Creole		Other	House	Farmer	Trader	Industry	School	Koranic School	Child or None	Muslim	R.C.	Protestant	Pagan	Literate	Arabic
Under 1	12	3	15	6.3	15	-	-	-	-	14	1	-	-	-	12	-	-	-	-	-	15	15	-	-	-	-	-		
1 - 4	21	19	40	16.7	40	-	-	-	-	39	1	-	-	-	29	1	1	-	-	-	38	36	-	1	3	-	-		
5 - 9	15	16	31	13.0	31	-	-	-	-	31	-	-	-	-	21	6	23	1	-	5	6	5	25	2	-	4	1	-	
10-14	8	7	15	6.3	14	1	-	-	-	15	-	-	-	-	14	4	13	2	-	4	4	-	12	2	-	1	2	-	
15-19	5	3	8	3.3	6	2	-	-	-	8	-	-	-	-	5	3	6	1	-	1	4	-	7	1	-	-	1	1	
20-24	4	19	23	9.6	2	20	1	-	-	23	-	-	-	-	12	17	21	5	-	-	1	-	17	-	-	6	-	-	
25-29	8	15	23	9.6	1	21	1	-	-	23	-	-	-	-	15	9	20	1	1	1	2	-	19	1	-	3	1	-	
30-34	2	9	11	4.6	-	10	1	-	-	11	-	-	-	-	8	6	9	2	1	-	1	-	11	-	-	-	-	-	
35-39	12	6	18	7.5	1	16	1	-	-	15	-	-	2	1	9	5	14	1	4	-	2	-	16	-	-	2	-	-	
40-44	3	5	8	3.3	-	7	-	-	1	6	-	-	1	1	4	4	6	-	2	1	1	-	5	-	2	1	1	-	
45-49	10	10	20	8.4	-	20	-	-	-	20	-	-	-	-	16	10	19	3	-	-	3	-	18	-	-	2	-	1	
50-54	2	4	6	2.5	-	6	-	-	-	6	-	-	-	-	3	1	6	1	-	-	2	-	6	-	-	-	-	1	
55-59	5	4	9	3.8	-	5	4	-	-	9	-	-	-	-	7	2	8	1	-	-	-	-	9	-	-	-	-	-	
60-64	3	4	7	2.9	-	5	2	-	-	7	-	-	-	-	6	3	6	1	-	-	2	-	7	-	-	-	-	2	
65-69	1	2	3	1.3	-	1	2	-	-	3	-	-	-	-	3	1	1	-	-	-	-	-	3	-	-	-	-	-	
70-74	-	2	2	0.9	-	1	1	-	-	2	-	-	-	-	1	2	1	-	1	-	-	-	2	-	-	-	-	-	
75 +	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
TOTAL	111	128	239		110	115	13	-	1	232	2	-	3	-	2	165	74	154	19	9	12	28	58	208	6	3	22	6	5
Percent %	46.4	53.6			46.0	48.1	5.4	-	0.4	97.1	0.8	-	1.3	-	0.8	69.0	31.0	64.4	7.9	3.8	5.0	11.7	24.3	87.0	2.5	1.3	9.2	2.5	2.1

42.3% of the population are under 15 years old. 23% of the village population are under 5 years old.

In the age groups 20-39 there are only 26 males compared with 49 females. This is in contrast with Lunsar's almost exactly equal numbers in these age groups.

At the time of the survey there were 12 Bundu girls, age 5 - 14 away being initiated. There are not included in the census data. If they were, the female dominance would be accentuated. The wide age range of the girls undergoing this form of initiation would indicate that this so-called puberty institution is in fact a social "puberty" and not a biological one. The population under 20 is greater than that between 20 and 40 (109:75) hence, if immigration is left out, the population of the village will tend to increase.

#### Civil State

40.5% of all males and 54.7% of all females were married. All females in these age groups were married. The youngest married females were aged 14 years.

Of 45 married males, 23 (51.1%) had one wife, 10 (22.2%) had two wives, 4 (8.8%) had 3 wives, and 6 (13.3%) had four wives. One male had 9 wives and one had 10 wives. 48.7% of marriages were polygynous, See Table 34.

#### Tribe

Temne make up 97.1% of the population. There are three male Limba, and two females are Yoruba and one Loko,

who make up the non-Temne population.

#### Birthplace

73% of the males and 65.6% of the females were born in Masimera.

#### Religion

90.1% of males and 84.4% of females are Muslim. 9.2% of both sexes are pagans. 2.5% are Roman Catholics and Protestants are 1.3% of the population.

#### Education

3.6% of males and 6.3% of females were attending or had attended school. 23.4% of males and 1.6% of females were attending or had attended the Koranic School. One Roman Catholic teacher is included in the category "School" and one Koranic teacher, the Alfa, is included in the category "Koranic School".

#### Literacy

1.8% of males and 3.1% of females were literate in English.

3.6% of males and 0.8% of females stated that they were literate in Arabic.

#### Occupation

As in the town, persons frequently have more than one occupation.

'House' 56.3% of females gave this as their occupation.

Polygyny, Masimera

Number of wives per married male

Married Males		Number of living wives										Total Wives
Age	N	1	2	3	4	5	6	7	8	9	10	
15 - 19	-	-	-	-	-	-	-	-	-	-	-	-
20 - 24	2	2	-	-	-	-	-	-	-	-	-	2
25 - 29	7	4	3	-	-	-	-	-	-	-	-	10
30 - 34	2	-	1	1	-	-	-	-	-	-	-	5
35 - 39	11	6	3	2	-	-	-	-	-	-	-	18
40 - 44	2	2	-	-	-	-	-	-	-	-	-	2
45 - 49	10	4	3	-	3	-	-	-	-	-	-	22
50 - 54	2	-	-	-	1	-	-	-	-	1	-	13
55 - 59	5	4	-	-	-	-	-	-	-	-	-	14
60 - 64	3	-	-	1	2	-	-	-	-	-	-	11
65 - 69	1	1	-	-	-	-	-	-	-	-	-	1
70 - 74	-	-	-	-	-	-	-	-	-	-	-	-
75 plus	-	-	-	-	-	-	-	-	-	-	-	-
Total	45	23	10	4	6	-	-	-	-	1	1	98
Per cent		51.1	22.2	8.8	13.3	-	-	-	-	2.2	2.2	

Only 1.8% of males, all children, gave this as their occupation.

"Farmer" As would be expected 63.1% of males and 65.6% of females gave farming as their occupation. As mentioned in section 10.5.e. women would give "Farmer" as their occupation and say that they worked in the "House" only if questioned. Thus the population is predominantly occupied with farming. This is in marked contrast with Lunsar.

"Trader" 2.7% of males and 12.5% of females were traders in Masimera. 3 females between 5 - 14 years were traders, similar to Lunsar's street traders. There are only two shops in Masimera.

"Industry" There is no organised industry in any of the villages, so the term is used in connection with the village to include the manufacture of articles such as baskets. It also includes salaried officials such as Native Administration personnel.

In Masimera 5.4% of males and 2.3% of females are so engaged.

The six males in this category are:-

Carpenter	1
Court Messengers	3
Goldsmith	1
Native Administration Clerk	1

The Goldsmith was from Freetown, and was staying in the village for some time.

In addition to the above one male had the duties of the "Chief's Messenger" and another as the "Crownor of the Chief". These are ceremonial duties. One female was a Digba, a high official in the Sande Society, a women's society. The three females engaged in "Industry" had the occupations of fish net maker, dyer of clothes and midwife.

#### 11.1.9. Clinical Data

The data extracted from the schedules are shown in Tables 35, 36, 37, 38, 39 and 40.

#### Morbidity

##### Malaria

As in Lunsar, thick blood films only were examined for 98.3% of the population. *Plasmodium falciparum* was the only parasite recognised. It was present in 89.8% of females, with gametocyte rates of 6.2% and 4.4%.

As in Lunsar, there is a marked difference in adult spleen rates (Table 38). The rate for males being 12.7% and for females, 43.3%. The differences in the spleen-rate 2 - 9 years is smaller, being 100% in males and 93.5% in females.

Acanthocheilonema perstans was seen in 1.7% of the population.





TABLE 36

## CLINICAL DATA, MASIMERA

## FEMALES

AGE	PARASIT AEMIA					ONCHOCERCIASIS					DENTITION				EYES		HAIR	LIPS			TONGUE				BONES			ILLNESS			ULCERS	SCARS	HERNIA		SKIN										
	Persons	Blood Film Taken	Plasmodium Falciparum Positive	Gametocytes Present	Acanthocheilonema Perstans	Mean Haemoglobin Percent	Skin snip taken	mf.o. Volvulus Present	Nodules Positive	Onchocerciasis positive	Onchodermatitis	Normal	Caries	Missing	D.M.F.	Gingivitis	Uniform Opacities Present	Abnormal	Blind	Hypochromotrichia	Normal	Cheilosis	Angular Stomatitis	Normal	Glossitis	Fissured	Geographical	Normal	Bowed skull	Beaded ribs	Bow legs	Nutritional Deficiency Present	V.D. Present or Past	Complaints of Illness	Ulcers present	Vaccination Present	Other soars	Umbilical	Inguinal	Lichenified	Depigmented	Loss Elasticity	Xerosis		
Under 1	3	3	2	-	-	53.3	-	-	-	-	3	-	-	-	-	-	-	-	-	3	-	-	3	-	-	-	3	-	-	-	-	-	3	-	-	-	3	-	-	-	-	-	-	-	
1 - 4	19	19	19	2	-	50.3	3	-	-	-	15	2	1	4	2	-	-	-	11	16	2	3	18	1	-	-	19	-	-	-	-	-	12	-	17	1	4	3	18	-	-	-	-	-	
5 - 9	16	16	16	-	-	50.9	15	-	-	-	7	9	1	9	7	1	-	-	10	9	1	6	14	2	-	-	16	-	-	-	-	-	14	-	10	1	9	5	13	-	-	1	-	-	
10 - 14	7	7	6	-	-	59.3	7	1	3	4	5	2	-	2	1	1	-	-	3	-	4	6	-	1	-	7	-	-	-	-	-	4	-	7	-	7	5	4	-	-	-	-	-		
15 - 19	3	3	3	-	-	60.0	3	1	2	2	1	2	-	2	-	3	-	-	2	1	-	1	-	2	-	3	-	-	-	-	-	1	-	2	-	3	1	2	-	1	-	-	-		
20 - 24	19	18	15	2	1	58.1	18	10	9	14	1	11	8	5	8	7	18	-	1	8	3	8	15	2	3	-	19	-	-	-	-	10	-	15	2	16	15	10	-	4	-	1	-		
25 - 29	15	15	14	-	-	58.7	15	11	13	13	3	12	5	12	8	11	-	-	7	-	8	10	-	5	-	15	-	-	-	-	-	9	-	14	-	11	13	12	-	2	-	-	-		
30 - 34	9	9	7	-	-	59.9	9	6	6	6	1	4	5	3	5	8	-	-	4	-	5	5	-	3	1	9	-	-	-	-	-	5	-	8	-	7	5	6	-	2	-	-	-		
35 - 39	6	6	5	-	-	63.3	6	5	6	6	-	6	4	6	5	5	1	-	4	-	2	5	-	1	-	6	-	-	-	-	-	2	-	4	1	3	2	3	-	-	-	-	-		
40 - 44	5	5	5	-	-	56.0	5	5	4	5	1	4	3	5	3	5	2	-	3	1	2	3	1	1	-	5	-	-	-	-	-	3	-	4	-	5	3	2	-	1	1	-	-		
45 - 49	10	10	9	-	1	58.0	10	8	10	10	2	10	8	10	9	10	8	-	7	-	3	6	-	4	-	10	-	-	-	-	-	3	-	9	-	7	7	1	-	3	1	-	-		
50 - 54	4	4	3	-	-	60.0	4	3	4	4	1	4	4	4	3	3	-	-	3	-	1	3	-	1	-	4	-	-	-	-	-	1	-	4	1	2	3	-	-	1	-	1	-		
55 - 59	4	4	3	-	-	53.8	4	4	4	4	-	4	4	4	2	4	3	-	2	2	-	3	-	1	-	4	-	-	-	-	-	3	-	4	-	4	3	-	-	-	1	1	-	-	
60 - 64	4	4	3	1	-	51.3	4	4	4	4	1	4	4	4	4	4	1	-	3	-	1	2	-	2	-	4	-	-	-	-	-	1	-	4	-	3	4	1	-	1	-	1	-		
65 - 69	2	2	2	-	-	60.0	1	1	2	2	-	2	2	2	1	2	1	-	2	-	-	1	-	1	-	2	-	-	-	-	-	1	-	1	-	2	1	-	-	1	-	1	-		
70 - 74	2	2	1	-	-	55.0	2	2	2	2	-	1	1	1	1	2	-	1	-	2	-	-	1	-	1	-	2	-	-	-	-	-	2	-	-	1	-	-	-	-	2	-	-	-	
75 +	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	128	127	113	5	2	56.0	106	61	69	76	7	50	76	43	78	77	11	1	72	78	8	43	96	6	26	1	128	-	-	-	69	-	108	6	83	70	75	-	16	4	7	-	-		
Percent		99.2	89.0	4.4	1.6	7.7 gm/100 ml	82.8	57.5	53.9	59.4	9.1	39.1	59.4	35.2	60.9	45.3	60.2	8.6	0.8	17.2	60.9	6.3	33.6	75.0	4.7	20.3	0.8	100.0	-	-	-	53.9	-	84.4	4.7	65.0	54.3	58.6	-	12.5	3.1	5.5	-	-	

\* Left eye only



Onchocerciasis.

51.4% of males and 59.4% of females were positive for onchocerciasis. There are proportionately more females than males in the age groups affected.

Masimera lies about one mile from the Rokel River, whereas Lunsar lies about two miles away and the rates are higher in Masimera. The rate for both sexes is 55.6% compared with 49.5% at Lunsar.

It will be noticed that females have a higher rate than males at Masimera whereas the opposite is the case in Lunsar. This relationship is reversed when the figures are standardised against the Lunsar population.

The youngest persons with nodules in Masimera were a male aged 5 and a female aged 12. The youngest persons with positive skin snips were a male aged 5 and a female aged 14.

The great trochanters and the iliac crests are the commonest sites for onchocercomata and 20.0% of persons have one nodule only. Thus multiple nodules are commoner than in Lunsar. Of the conditions associated with onchocerciasis three males had elephantiasis of the scrotum and one elephantiasis of the leg.

Strong (1938) summarises evidence for this association and points out that in Guatemala no case of hydrocele or elephantiasis has been reported as a complication of

onchocerciasis, other forms of filariasis not being encountered in the country. Numerous authoritative reports from Africa show that elephantiasis sometimes occurs in association with onchocercal infection, though it is not so common as it is in association with *Wuchereria bancrofti* infection.

#### Dentition

The D.M.F. rates are slightly lower than those for Lunsar, 55.0% for males and 60.9% for females.

39.6% of males and 45.3% of females had gingivitis.

#### Eyes

There was one male, aged 48, blind in both eyes, probably due to onchocerciasis.

The female aged 70, was blind in the left eye only. She was positive for onchocerciasis and the blindness was probably due to this cause. She also had a spastic paralysis of the right arm following a cerebral catastrophe four years ago.

Abnormal sight was complained of by 5.4% of males and 8.6% of females. All these persons were over 25 years old.

The common complaints were inability to see distant objects and seeing "black objects" in front of the eyes.

MALARIA

Table 38

MASTIMERA

Splenomegaly

Both sexes N = 239

Class of Spleen	age group				
	0 - 1	2 - 4	5 - 9	10-14	Adults
0	8	1	1	1	95
1	2	5	6	6	25
2	3	6	16	6	17
3	6	15	7	2	1
4	4	3	1	-	-
5	-	2	-	-	-

Spleen<sub>2</sub> rate 2 - 9 years = 96.8% Adults = 31%

Males N = 111

Class of Spleen	age group				
	0 - 1	2 - 4	5 - 9	10-14	Adults
0	6	-	-	-	48
1	1	4	2	4	4
2	2	2	9	3	2
3	5	7	3	1	1
4	2	3	1	-	-
5	-	1	-	-	-

Spleen<sub>2</sub> rate 2 - 9 years = 100% Adults = 12.7%

Females N = 128

Class of Spleen	age group				
	0 - 1	2 - 4	5 - 9	10-14	Adults
0	2	1	1	1	47
1	1	1	4	2	21
2	1	4	7	3	15
3	1	8	4	1	-
4	2	-	-	-	-
5	-	1	-	-	-

Spleen<sub>2</sub> Rate 2 - 9 years = 93.5% Adults = 43.3%

MASIMERA

Table 39  
Frequency of site of Onchocercosmata

Site of Onchocercosmata	Males	Females	Total	%
Sacrum	22	25	47	24.7
Gt. Trochanters	25	49	74	38.9
Iliac crests	26	33	59	31.1
Thorax (ribs)	3	1	4	2.1
Head	-	-	-	
Legs	2	-	2	1.1
Groin	4	-	4	2.1
	82	108	190	

MASIMERA

Table 40  
Number of Onchocercosmata per Person

Number of Onchocercosmata	Males	Females	Total	%
1	9	15	24	20.0
2	10	16	26	21.7
3	7	9	16	13.3
4	2	7	9	7.5
5	4	4	8	6.7
6	3	4	7	5.8
7	2	4	6	5.0
8	2	4	6	5.0
9	-	-	1	0.8
10 plus	10	7	17	14.2
	49	71	120	

My impression is that the latter complaint is due to the presence of micro-filaria in the anterior chamber of the eye.

The uniform opacities seen in Lunsar were also seen in Masimera in 60.2% of males and 53.6% of females.

#### Hypochromotrichia

This was seen in 1.8% of males and 17.2% of females.

#### Nutritional Deficiency

Using the same criteria as were used in Lunsar 33.3% of males and 53.9% of females suffered from nutritional defect. One female infant was marasmic.

These rates are considerably higher than those for Lunsar. It is also noteworthy that females have more nutritional deficiency than males.

#### Ulcers

These were seen in 3.6% of males and 4.7% of females.

It should be remembered in conjunction with the last two headings that the villages were being examined at the best time of the year from the point of view of nutrition.

#### Vaccination.

Vaccination scars were seen in 65.7% of both sexes. This rate is lower than Lunsar.

#### Venereal Diseases

24.3% of all males stated that they were suffering

from or had suffered from a urethral discharge. 2 had active gonorrhoea, a diagnosis not confirmed bacteriologically.

Thus 49.0% of males of 15 years and over had had venereal disease in Masimera.

Other Conditions

Many other conditions were seen during the course of the survey, among them were the following:-

	Males	Females	Total
1. Diarrhoea	9	7	16
2. Dysentery	2	2	4
3. Elephantiasis leg	1	-	1
4. Elephantiasis scrotum	3	-	3
5. Goitre	-	1 (aged 50)	1
6. Hydrocele	3	-	3
7. Injury	3	5	8
8. Marasmus	-	1	1
9. Measles	6	3	9
10. Measles complicated by broncho-pneumonia	6	3	9
11. Scabies	5	5	10
12. Sepsis	6	2	8
13. Stammerers	1(aged 42)	1(aged 36)	2
14. Tuberculosis	2	-	2
15. Worms (Ascaris ) (Enterobius)	11	9	20
	58	39	97



Patients seen outside the Sample at Masimera

During the ten working days in the village 56 patients were seen

Age in Years	M	F	T
Under 1	1	5	6
1 - 4	9	9	18
5 - 9	6	3	9
10 - 14	-	-	-
15 - 19	-	1	1
20 - 24	-	4	4
25 - 29	1	1	2
30 - 34	4	2	6
35 - 39	-	-	-
40 - 44	1	1	2
45 - 49	-	-	-
50 - 54	2	4	6
55 - 59	1	-	1
60 - 64	1	-	1
65 - 69	-	-	-
70 - 74	-	-	-
75 plus	-	-	-
	26	30	56

Clinical Conditions noted.

Some patients had more than one disease.

1. Appendicitis	1
2. Malaria	17
3. Measles - Broncho-pneumonia	26
- otitis media	1
4. Onchocerciasis	7
with blindness	2
with near blindness	2
5. Scabies	1
6. Sepsis	1
7. Tuberculosis - cold abscess	1
8. Vomiting and Diarrhoea	7
	<hr/>
	66
	<hr/>

11.1.10. Physiological Data.

The only data of this sort collected were Haemoglobin levels. The mean haemoglobin level for males is 7.9 gms/100 ml and for females 7.7 gms/100 ml. The lowest levels are seen in the children, there being an upward trend in young adulthood.

11.1.11. Fertility and Survival

Fertility and Survival and the ages at which children died are set out in Tables 41 and 42.

Fertility

There were 19 live births, 13 males and 6 females

FEMALES

Table 41

FERTILITY AND SURVIVAL, MASIMERA

Age	Persons	Live Births			Stillbirths			Live Births in last year			Still Births in last year			Live Births Dying within year			Multiple Pregnancies Live (Still)	Abortions	Children Dying			Non-Fertile Married Females	One Pregnancy only
		M	F	T	M	F	T	M	F	T	M	F	T	M	F	T			M	F	T		
15 - 19	3	1	-	1	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	1	1	
20 - 24	19	21	14	35	2	1	3	6	1	7	-	-	-	-	-	-	1	4	4	8	2	6	
25 - 29	15	32	31	63	3	-	3	2	3	5	-	-	-	1	-	1	1 Twins MF	4	15	20	35	1	2
30 - 34	9	22	19	41	4	4	8	4	1	5	-	-	-	-	-	-	1 Twins MM (1 still MF)	7	13	7	20	1	-
35 - 39	6	11	17	28	-	-	-	-	1	1	-	-	-	-	-	-	1 Twins MF	1	7	8	16	1	1
40 - 44	5	18	20	38	-	3	3	-	-	-	-	-	-	-	-	-	-	1	8	14	22	-	-
45 - 49	10	30	27	57	4	7	11	-	-	-	-	-	-	-	-	-	1 Twins MM (1 Still FF) 1 Triplets MMM	11	21	15	36	-	-
50 - 54	4	10	15	25	-	-	1	-	-	-	-	-	-	-	-	-	2 Twins MF FF	2	5	11	16	-	-
55 - 59	4	13	15	28	3	5	8	-	-	-	-	-	-	-	-	-	1 Twins FF	3	6	8	14	-	-
60 - 64	4	12	16	28	1	2	3	-	-	-	-	-	-	-	-	-	1 Twins FF	2	7	6	13	-	1
65 - 69	2	1	2	3	-	1	1	-	-	-	-	-	-	-	-	-	-	-	1	1	2	-	1
70 - 74	2	1	4	5	5	1	6	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-
75 plus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	83	172	180	352	22	25	47	13	6	19	-	-	-	1	-	1	8 Twins (3 Still) 1 Triplets	32	87	96	183	6	12

Table 42

Ages at which children died, Masimera.

Age Group of Mother	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55-59	60 - 64	65 - 69	70 - 74	75+	Total	%
N	3	19	15	9	6	5	10	4	4	4	2	2	-	83	
Age at Death	NUMBERS OF CHILDREN DYING													Total	%
0 - 1m.	-	2	3	1	2	4	10	-	3	3	-	-	-	28	15.3
2m - 1 yr.	-	4	15	5	5	6	10	3	6	6	-	1	-	61	33.3
Under 1 yr.	-	6	18	6	7	10	20	3	9	9	-	1	-	89	48.6
1 - 4 yrs.	-	2	14	10	7	9	10	10	5	-	1	-	-	68	36.6
5 - 9 yrs.	-	-	3	2	1	-	4	1	-	1	-	-	-	12	6.6
10 -14 yrs.	-	-	-	2	1	1	1	1	-	1	-	-	-	7	3.8
15 -19 yrs.	-	-	-	-	-	2	1	1	-	-	-	-	-	4	2.2
20 yrs plus.	-	-	-	-	-	-	-	-	-	2	1	-	-	3	1.7
Total	-	8	35	20	16	22	36	16	14	13	2	1	-	183	99.5

during the last year, 1960-61, in a population of 239 111 males, 128 females).

The Crude Birth Rate is therefore 79.5 per 1,000.

Fertility Rate.

Taking the reproductive age period in women as being 15 - 49 years, there were 67 females in this age group in Masimera.

In the year under review there were 19 live births, giving a General Fertility Rate of 283.5 per 1,000.

46 females, aged 30 and over, gave birth to 253 live births. The mean number of children born alive to each female in these age groups is therefore 5.5.

Of the 67 females in the reproductive age group, 1 (1.4%) was unmarried and 4 (5.9%) were widowed. Of the 66 females who were married or had been married 6 (9.9%) had never been pregnant. No unmarried female had been or was pregnant.

Family Size

From the distribution of ever-married women by number of children born alive (Table 42A) it is seen that 13.3% of women aged 30 had over had one live born child and the same percentage had 7 children born alive. For women of completed fertility the distribution of numbers of children born alive is fairly regular. The average number of children born alive to this group was 5.6 children.

Table 42A

Distribution of Ever-married Women by number of Children born alive

Present Age of Women	Number of women with the following number of children born alive												Total number of women	
	0	1	2	3	4	5	6	7	8	9	10	11		12+
15 - 29	5	8	7	5	4	4	1	1	-	-	-	-	1	36
30 - 44	2	2	1	1	2	1	1	4	2	3	1	-	-	20
45 and over	1	4	3	2	1	2	2	2	2	-	2	1	3	25
TOTAL	8	14	11	8	7	7	4	7	4	3	3	1	4	81

### Sterility

Of the 6 non-fertile married females 3 had been married for 2 years or less, and 3 for 7 years or more. Thus three were sterile in the reproductive age groups, a rate of 4.4%

12 females (14.4%) had had one pregnancy only, in the age groups 15 years and over.

The youngest married female was 14 years old. She had been married 2 months but was not cohabiting with her husband.

### Multiple Pregnancy Rate

There were 8 sets of live twins and 1 set of live triplets. 3 sets of twins were stillborn.

Out of 352 live births there were 9 multiple pregnancies a Multiple Pregnancy Rate of 25 per 1,000 live births.

2 sets of twins were males, 3 sets were females, 3 sets males and females. The triplets were all males.

### Sex Ratio at Birth

Using total live births of all the females in Masimera, the Sex Ratio is 95.5 liveborn males per 100 live born females.

### Survival

It was not possible to ascertain death rates in the absence of any registration.

From Table 42 it is possible to calculate the proportional rates for the children who died.

Thus 15.3% of the children who died in Masimera were under 1 month and 48.6% of the total deaths were under 1 year. This is similar to the rate for Lunsar. Infant deaths - Toddler deaths ratio is 1.3.

#### Infant Mortality Rate.

There was only one death of a child in its first year and this would give an Infant Mortality Rate of 52.6 per 1,000.

If, however, a calculation is made based on all the females in the clinical sample (83) and using the total number of live births to these females, 352, and the number who died under 1 year of age, 89; the mortality rate for these infants is 252.8 per 1,000.

Out of 183 children who died, 28 (15.3%) died under 1 month, 89 (48.6%) died under 1 year and 68 (36.6%) died in the 2 - 4 age group.

#### Stillbirth Rate

This cannot be calculated as there were no stillbirths in the last year. There were, however, 47 recorded stillbirths and 352 live births among the group of women investigated, a proportion of 118 per 1,000 births, live and still.



### Abortions

82 females in Masimera who were married or had been married had 32 abortions, a rate of 0.39 per female. There were 74.2 abortions per 1,000 pregnancies.

### Commentary

The numbers are small in Masimera but the high death rates in the first month, first year and toddler group are evident.

Masimera gives the impression of being a fairly prosperous village, judging by the visible exports of rice, groundnuts, etc., the goods in the shops, and the apparel of the villagers.

### 11.2. Kamasundu

Kamasundu is situated in the Buya Romende Chiefdom and lies north of Lunsar some 18 miles away by road. It is about 16 miles away from the Rokel River as the crow flies. It is also about 16 miles south of the Mabole River. East of the village is the Matutuk Stream from which the water supply is drawn. The Masagbaine stream lies to the west.

Kamasundu lies on the Foradugu - Gbinti road, known as the Old Makeni Road.

Kamasundu was chosen because:-

1. This village was not listed among those birthplaces of Lunsar inhabitants but many gave the Chiefdom as

their birth place, and, in fact, some Kamasundu people had moved to Lunsar, according to the Chief.

2. The village is too far from S.L.D.C. mines for daily commuting to be possible.
3. Only Africans live in Kamasundu, it was founded a long time ago, and the village has an entirely agricultural economy.
4. It is about 16 miles from the Rokel River towards the limit of the flight range of *Simulium damnosum*, and could thus be expected to exhibit differential onchocerciasis rates.
5. It is a fairly large village away from the main roads, and thus less likely to be influenced by the proximity of a town.

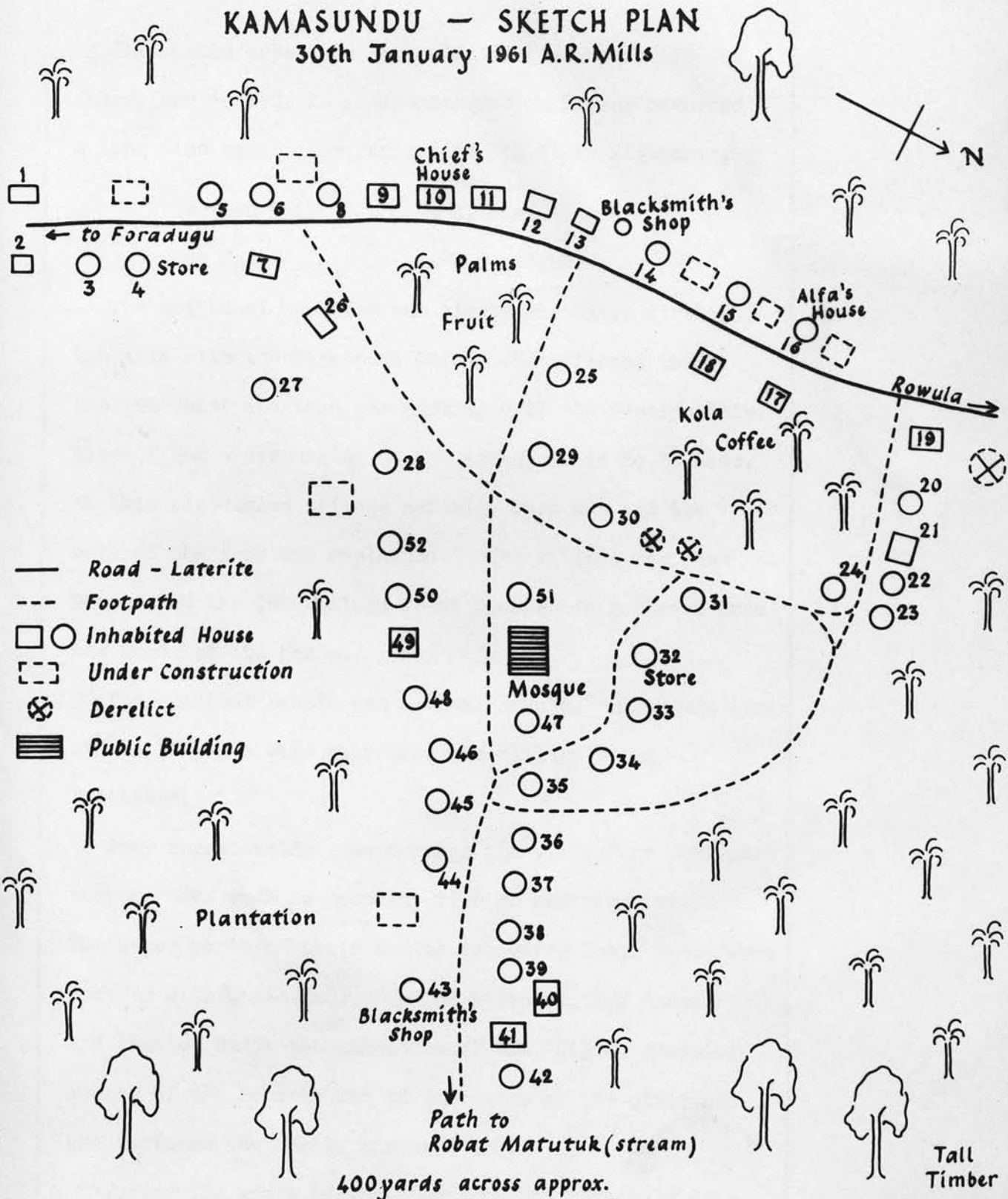
The village lies on flat land but towards its eastern and northern borders the land slopes gently. On the eastern fringe of the village are stands of tall timber with fruit gardens bordering this and in clearings.

The sketch plan shows the layout of the village.

Monkeys frequent these areas and steal fruit from the trees. On many occasions whilst working in the village the monkeys were heard and seen during their raids, the dogs of the village setting up a chorus of barking.

# KAMASUNDU — SKETCH PLAN

30th January 1961 A.R.Mills



This would appear to be a classical setup for yellow fever, and indeed, it was remembered as having occurred a long time ago. The Temne word for it is N'gbonkey.

Section Chief Pa Alimamy Kamara

Sub Chief Pa Bai Kargbo

The method of approach was always the same, first the talk with the Paramount Chief, who informed the Section Chief and then the meeting with the Section Chief himself and a discussion of the arrangements to be made. At this discussion village notables were met and the work of the team was explained. The village was then mapped and the information about households gathered from the heads of the houses.

The clinical sample was a total sample. 20 Bundu girls of 5 - 14 years were away from the village being initiated.

They occasionally came through the village or performed various tasks such as pounding rice or carrying water. The upper parts of their bodies including their faces were covered with white mud. On one occasion they danced and chanted under the direction of the Digba, a senior member of the Society who is in charge of the girls and who performs the female circumcision.

During the visit to the houses to get household data,

one woman was resistant and refused to give information. I spoke to the Chief about this and he talked with the woman, who was a Digba, and she decided to co-operate. She later became one of our best supporters and gave presents of eggs.

In this village, the Chief said that they wanted to know why I was asking questions about food, produce, etc., and I explained the relationship between economics and health, and between food and health.

During the clinical part of the survey resistance was made by House No. 46 Momodu Kamara. I asked the Chief to help and I also went to see Mr. Kamara myself. He was one of the "wide boy" type flashily dressed and had a truculent manner. He said that if he wanted to see a doctor he would pay for one. His sister, aged about 18 years was lying ill in the next house with fever and she refused to see me. I was told that Mr. Kamara had made money in the diamond area. I tried to persuade him to be more reasonable but he would not listen. However, I took the opportunity whilst standing outside his house to note all its occupants and estimate their ages for inclusion in the census. The Chief said that these people would not be staying in the village for very long, and was apologetic about Mr. Kamara's behaviour.

Kamasundu was the most truly rural village visited.

Several persons had not seen a European before, the eldest being a girl of fifteen years of age. I did not at first believe this but on checking it was found to be true.

#### 11.2.1. Housing.

There were 52 houses in Kamasundu 47 (90%) of which were inhabited. 5 were used as stores. 36 (69%) were made of mud and sticks and thatched, and were of the traditional round form - all the round houses being thatched. It is, of course, much easier to construct a corrugated iron roof for a rectangular house (31% of houses) than for a round house and the use of this material may indeed be a strong practical reason for changing the form of the house. All the houses were owned by the occupiers.

There were 228 rooms in the 52 houses a mean of 4.3 rooms per house, 218 being in the 47 inhabited houses. There were 371 persons in the village occupying these houses at a density of 7.7 persons per house or 1.6 persons per room. There were 5.5 persons in a separate Family Unit. There were 1.4 Separate Family Units per house.  
Overcrowding.

4.1% of the population is under 1 year and 32.4% between 1 and 10 years. Thus the factor is 20% approximately.

13 houses out of 47 i.e., 27.6%, were overcrowded.

Latrines.

20 houses 42.5% had deep pit latrines a rate of 1 per 18 persons.

6 households had food gardens.

11.2.2. Water Supply.

Drawn from the Robat Matutuk stream.

11.2.3. Rubbish Disposal

Each house disposes of its own rubbish by burning or burying or putting on gardens. Few mosquitoes or flies were noticed in the village.

11.2.4. Burial of the Dead.

This is done close to houses, inside or outside.

11.2.5. Medical Services.

There is no clinic in the village, but there is a government Dispensary at Rosint about 5 miles away towards Foradugu. Ibrahim M. Sesay is the Dispenser.

The Health Inspector is Abdulai Sesay who lives at Foradugu 10 miles away.

A nursing sister Mankapr Sankoh, who is the midwife, lives at Rowula about 2 miles from Kamasundu in the Buya Romende Chiefdom. She was trained at Port Loko Hospital. Her training lasting 18 months only. She has a small room, without a bed, for a clinic, kept neatly, and basic instruments and medicines supplied by the Government. She has been in practice for 6 years

and worked in the Buya Romende and Tinkatopa - Makama - Safroko - Dibuya Chiefdoms.

From 8.11.59 - 20.1.61 she delivered 2 male and 3 female babies at Kamasundu. Her total case load from 6.10.59 - 31.1.61 was 176. In 1960 she delivered 131 babies.

Women do not leave Kamasundu for their confinements.

The handicapped consisted of three blind persons.

#### 11.2.6. Shops.

There are two small shops. No. 17 and No. 46 selling the following articles:-

Bonga - dried fish

Kerosene

Tobacco

Sardines

Salt

Pepper

Onions

Fish, groundnuts for sale at No. 46.

#### 11.2.7. School

There is no school in Kamasundu except for Koranic schools. One child goes to the Roman Catholic School at Rosint about 5 miles away.

#### 11.2.8. Census Data, Kamasundu

This is set out in Tables 43, 44 and 45.

#### Population Structure.

Females are more numerous than males, there



TABLE 43.

## CENSUS DATA, KAMASUNDU.

## MALES.

Age	Persons	Civil State					Tribe						Born in Village	Occupation							Religion				Literacy.	
		Single	Married	Widowed	Divorced	Separated	Temne	Mende	Fulah	Limba	Creole	Other		House	Farmer	Traders	Industry	School	Koranic School	Child or None	Muslim	R.C.	Protestant	Pagan	Literate	Arabic
Under 1	9	9	-	-	-	-	9	-	-	-	-	-	8	-	-	-	-	-	-	9	9	-	-	-	-	-
1 - 4	36	36	-	-	-	-	35	-	-	-	-	1	29	-	3	-	-	-	-	33	36	-	-	-	-	-
5 - 9	32	32	-	-	-	-	27	-	1	2	-	2	32	-	26	-	1	1	10	5	30	1	-	1	-	-
10 - 14	10	10	-	-	-	-	9	-	-	-	-	1	10	-	9	-	1	-	7	-	10	-	-	-	-	-
15 - 19	8	6	2	-	-	-	7	-	-	-	-	1	8	-	7	-	1	-	3	-	8	-	-	-	-	-
20 - 24	8	4	4	-	-	-	8	-	-	-	-	8	8	-	6	-	2	-	3	-	8	-	-	-	-	-
25 - 29	12	2	10	-	-	-	9	-	-	-	-	3	11	-	12	-	-	-	5	-	10	-	-	2	-	-
30 - 34	9	-	9	-	-	-	9	-	-	-	-	-	9	-	8	-	4	-	3	-	9	-	-	-	-	-
35 - 39	8	-	5	-	1	2	7	-	-	-	-	1	8	-	8	-	-	-	2	-	8	-	-	-	-	-
40 - 44	9	-	9	-	-	-	8	-	-	1	-	-	8	-	8	1	-	-	5	-	9	-	-	-	-	-
45 - 49	10	-	9	-	1	-	8	-	-	1	-	4	8	-	9	-	1	-	2	-	9	-	-	1	-	-
50 - 54	5	-	5	-	-	-	4	-	-	-	-	1	5	-	5	-	-	-	4	-	5	-	-	-	-	-
55 - 59	6	-	6	-	-	-	5	-	-	-	-	1	6	-	6	-	-	-	2	-	6	-	-	-	-	-
60 - 64	3	-	1	2	-	-	3	-	-	-	-	-	3	-	3	-	-	-	1	-	3	-	-	-	-	-
65 - 69	3	-	3	-	-	-	3	-	-	-	-	-	3	-	3	-	-	-	1	-	3	-	-	-	-	-
70 - 74	1	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	-	1	-	1	-	-	-	-	-
75+	2	-	2	-	-	-	2	-	-	-	-	-	2	-	2	-	-	-	-	-	2	-	-	-	-	-
TOTAL	171	100	65	2	2	2	154	-	1	4	-	12	158	-	115	1	8	1	49	47	166	1	-	4	-	-
Percent		58.5	38.0	1.2	1.2	1.2	90.1	-	0.6	2.3	-	7.0	92.4	-	67.3	0.6	4.7	0.6	28.7	27.5	97.1	0.6	-	2.3	-	-

TABLE 44

FEMALES.

CENSUS DATA, KAMASUNDU.

AGE	Persons	Civil State					Tribe						Born in Village	Occupation							Religion				Literacy.	
		Single	Married	Widowed	Divorced	Separated	Temne	Mende	Fulah	Limba	Creole	Other		House	Farmer	Trader	Industry	School	Koranic School	Child or None	Muslim	R.C.	Protestant	Pagan	Literate	Arabic
Under 1	6	6	-	-	-	-	6	-	-	-	-	-	6	-	-	-	-	-	-	6	5	-	-	1	-	-
1 - 4	32	32	-	-	-	-	30	-	1	-	-	1	30	-	1	-	-	-	-	31	31	-	-	1	-	-
5 - 9	18	18	-	-	-	-	15	-	2	-	-	1	15	2	14	-	-	-	3	3	16	-	-	2	-	-
10-14	6	6	-	-	-	-	6	-	-	-	-	-	5	2	6	-	-	-	-	-	5	-	-	1	-	-
15-19	11	3	8	-	-	-	11	-	-	-	-	-	10	7	11	4	-	-	-	-	11	-	-	-	-	-
20-24	20	-	10	-	-	-	20	-	-	-	-	-	10	16	16	4	-	-	-	-	15	-	-	5	-	-
25-29	21	-	21	-	-	-	21	-	-	-	-	-	10	17	20	1	-	-	-	-	19	-	-	2	-	-
30-34	15	-	14	-	-	1	13	-	1	-	-	1	9	13	14	1	1	-	3	-	13	-	-	2	-	-
35-39	8	-	8	-	-	-	7	-	-	-	-	1	3	7	6	2	1	-	-	-	7	-	-	1	-	-
40-44	8	-	7	1	-	-	7	-	1	-	-	-	5	3	7	1	-	-	-	-	7	-	-	1	-	-
45-49	15	-	12	2	-	1	13	-	-	-	-	2	10	12	14	2	2	-	1	-	13	-	-	2	-	-
50-54	3	-	5	-	-	-	4	-	-	-	-	1	3	1	5	-	-	-	-	-	5	-	-	-	-	-
55-59	13	-	10	2	-	1	10	-	1	-	-	2	11	9	13	-	-	-	2	-	13	-	-	-	-	-
60-64	1	-	-	1	-	-	1	-	-	-	-	-	1	-	1	-	-	-	-	-	1	-	-	-	-	-
65-69	4	-	-	4	-	-	4	-	-	-	-	-	3	3	3	1	1	-	-	-	4	-	-	-	-	-
70-74	5	-	4	1	-	-	4	-	-	-	-	1	2	4	3	-	-	-	-	-	5	-	-	-	-	-
75+	5	-	3	1	-	-	4	-	-	-	-	1	4	1	3	-	-	-	-	-	5	-	-	-	-	-
TOTAL	193	65	112	13	-	3	176	-	6	-	-	11	137	97	137	13	5	-	9	41	175	-	-	18	-	-
%		33.7	58.0	6.7	-	1.6	91.2	-	3.1	-	-	5.7	71.0	50.3	71.0	6.7	2.6	-	4.7	21.2	90.7	-	-	9.3	-	-

TABLE 45

## CENSUS DATA, KAMASUNDU.

TOTAL

AGE	Persons			Group as % Total	Civil State					Tribes					Born in Village	Occupation							Religion				Literacy	
	M	F	T		Single	Married	Widowed	Divorced	Separated	Temne	Mende	Fulah	Limba	Creole		Other	House	Farmer	Trader	Industry	School	Koranic School	Child or None	Muslim	R.C.	Protestant	Pagan	Literate
Under 1	9	6	15	4.1	15	-	-	-	-	15	-	-	-	-	14	-	-	-	-	-	15	14	-	-	1	-	-	
1 - 4	36	32	68	18.7	68	-	-	-	-	65	-	1	-	2	59	-	4	-	-	-	64	67	-	-	1	-	-	
5 - 9	32	18	50	13.7	50	-	-	-	-	42	-	3	2	3	47	2	40	-	1	1	13	8	46	1	-	3	-	-
10 - 14	10	6	16	4.4	16	-	-	-	-	15	-	-	-	1	15	2	15	-	1	-	7	-	15	-	-	1	-	-
15 - 19	8	11	19	5.2	9	10	-	-	-	18	-	-	-	1	18	7	18	1	1	-	3	-	19	-	-	-	-	-
20 - 24	8	20	28	7.7	4	24	-	-	-	28	-	-	-	-	18	16	22	4	2	-	3	-	23	-	-	5	-	-
24 - 29	12	21	33	9.1	2	31	-	-	-	30	-	-	-	3	21	17	32	1	-	-	5	-	29	-	-	4	-	-
30 - 34	9	15	24	6.6	-	23	-	-	1	22	-	1	-	1	18	13	22	1	2	-	6	-	22	-	-	2	-	-
35 - 39	8	8	16	4.4	-	13	-	1	2	14	-	-	-	2	11	7	14	2	1	-	2	-	15	-	-	1	-	-
40 - 44	9	8	17	4.7	-	16	1	-	-	15	-	1	1	-	13	3	15	2	-	-	5	-	16	-	-	1	-	-
45 - 49	10	15	25	6.9	-	21	2	1	1	21	-	-	1	3	18	12	23	2	3	-	3	-	22	-	-	3	-	-
50 - 54	5	5	10	2.8	-	10	-	-	-	8	-	-	-	2	8	1	10	-	-	-	4	-	10	-	-	-	-	-
55 - 59	6	13	19	5.2	-	16	2	-	1	15	-	1	-	3	17	9	19	-	-	-	4	-	19	-	-	-	-	-
60 - 64	3	1	4	1.1	-	1	3	-	-	4	-	-	-	-	4	-	4	-	-	-	1	-	4	-	-	-	-	-
65 - 69	3	4	7	1.9	-	3	4	-	-	7	-	-	-	-	6	3	6	1	1	-	1	-	7	-	-	-	-	-
70 - 74	1	5	6	1.6	1	4	1	-	-	5	-	-	-	1	2	4	3	-	1	-	1	-	6	-	-	-	-	-
75 +	2	5	7	1.9	-	5	2	-	-	6	-	-	-	1	6	1	5	-	-	-	-	4	7	-	-	-	-	-
TOTAL	171	193	364		165	177	15	2	5	330	-	7	4	23	295	97	252	14	13	1	58	88	341	1	-	22	-	-
Percent	47.0	53.0			45.3	48.6	4.1	0.5	1.4	90.7	-	1.9	1.1	6.3	81.0	26.6	69.2	3.8	3.6	0.3	15.9	24.2	93.7	0.3	-	6.0	-	-

being 193 (53.0%) out of a total population of 364. 40.9% of the population are under 15 years old. 22.8% of the village population is under 5 years old.

In the age groups 20-39 there are only 37 males compared with 63 females.

At the time of the survey there were 20 Bundu girls, aged 5 - 14 away from the village being initiated. They are not included in the Census.

#### Civil State.

38.0% of all males and 58.0 of all females were married.

23 (79.3%) out of 29 males between 20 and 35 years were married. All females in these age groups were married.

The youngest married female was aged 16 years.

Of 65 married males, 35 (53.8%) had one wife, 25 (38.4%) had two wives, one had three wives, two had four and one had six and one, eight wives. 45.2% of marriages were polygynous. See Table 46.

#### Tribe.

Temne are 90.7% of the population: 6.0% of the population are Mandingo. This enclave consists of 12 males and 10 females all of whom stated that they had been in Kamasundu many generations. There was also one Sherbro female.

Table 46

POLYGYNY, KAMASUNDU.

Number of wives per married male

Married males		Number of Living Wives								Total Wives
Age in years	N	1	2	3	4	5	6	7	8	
15 - 19	2	2	-	-	-	-	-	-	-	2
20 - 24	4	2	2	-	-	-	-	-	-	6
25 - 29	10	8	2	-	-	-	-	-	-	12
30 - 34	9	4	5	-	-	-	-	-	-	14
35 - 39	5	2	3	-	-	-	-	-	-	8
40 - 44	9	5	4	-	-	-	-	-	-	13
45 - 49	9	4	4	1	-	-	-	-	-	15
50 - 54	5	1	4	-	-	-	-	-	-	9
55 - 59	6	3	1	-	1	-	1	-	-	15
60 - 64	1	-	-	-	1	-	-	-	-	4
65 - 69	3	2	-	-	-	-	-	-	-	10
70 - 74	-	-	-	-	-	-	-	-	-	-
75 plus	2	2	-	-	-	-	-	-	-	2
Total	65	35	25	1	2	-	1	-	1	110
Percent		53.8	38.4	1.5	3.0	-	1.5	-	1.5	

Birthplace

81.0% of the males and 71.0% of the females were born in Kamasundu.

Religion.

97.1% of the males and 90.7% of the females are Muslim. There is one Roman Catholic in the village. 2.3% of males and 9.3% of females are pagan.

Education

Only one male, aged 5, was attending the Roman Catholic School at Rosint. No others had been to school.

28.7% of males and 4.7% of females were attending or had attended the Koranic School.

Literacy

There were none literate in either English or Arabic.

Occupation

'House' 50.3% of females and no males gave this as their occupation.

'Farmer' 67.3% of males and 71.0% of females gave this as their occupation.

'Trader' Only one man (0.6%) and 13 females (6.7%) were engaged in trading.

'Industry' As in Masimera, there is no organised industry.

8 (4.7%) males gave their occupations as -

Blacksmith	- 1
Blacksmith's apprentice	- 3
Carpenter	- 2
Diamond Digger	- 1
Tailor	- 1

In addition to these occupations, one man was Section Chief, another Imam, and three were Alfas or Arabic teachers.

5 females (2.6%) gave their occupations as:-

Dyer of clothes	- 3
Mat maker	- 2

In addition, one was a Digba, a high official of the Sande Society.

#### 11.2.9. Clinical Data

The data extracted from the schedules are shown on Tables 47, 48, 49, 50, 51 and 52.

#### Morbidity

##### Malaria

Plasmodium falciparum was present in 94.7% of males and 90.1% of females, with gametocyte rates of 14.6% and 11.6% respectively.

The spleen rates at ages 2 - 9 are 100% in both males

TABLE 47

## CLINICAL DATA, KAMASUNDU

## MALES

AGE	PARASITAEMIA					ONCHOCERCIASIS					DENTITION			EYES		HAIR	LIPS			TONGUE				BONES				NUTRITION		ILLNESS				SKIN								
	Persons	Blood Film Taken	Plasmodium Falciparum Positive	Gametoocytes Present	Acanthocheilonema Pergandi	Mean Haemoglobin Percent	Skin snip taken	mf. o. Volvulus Present	Nodules positive	Ochocerciasis positive	Onchodermatitis present	Caries	Missing	D.M.F.	Gingivitis	Uniform Opacities Present	Abnormal	Blind	Hypochoeremetricia	Normal	Cheilosis	Angular Stomatitis	Normal	Glossitis	Fissured	Geographical	Normal	Bossed Skull	Beaded ribs	Bow legs	Nutritional Deficiency Present	V.D. present or past	Complains of Illness	Ulcers present	Vaccination	Other	Umbilical	Other	Lichenified	Depigmented	Loss Elasticity	Xerosis
Under 1	9	9	7	1	-	51.1	-	-	-	-	-	-	-	-	-	-	-	-	9	-	-	9	-	-	-	9	-	-	-	-	-	4	-	-	-	9	-	-	-	-	-	-
1 - 4	36	36	36	11	-	46.8	4	-	-	-	4	-	4	4	-	-	-	2	14	18	19	35	1	-	-	35	1	1	-	26	-	29	2	6	8	30	-	1	-	-	-	-
5 - 9	32	32	32	2	1	50.6	31	1	-	1	18	4	18	19	1	-	-	-	1	29	22	23	7	2	-	32	-	-	-	31	-	23	2	15	18	32	-	15	-	-	-	-
10 - 14	10	10	10	-	-	51.0	10	1	2	2	3	-	3	2	3	-	-	1	-	10	6	7	2	1	-	10	-	-	-	10	-	7	-	5	6	7	-	6	-	-	-	-
15 - 19	8	8	8	3	-	52.5	8	3	4	5	3	-	3	2	7	-	-	-	-	8	5	8	-	-	-	8	-	-	-	8	2	8	1	3	6	3	-	7	-	-	-	-
20 - 24	8	8	8	1	-	58.8	8	2	4	4	4	1	4	4	7	-	-	-	-	8	6	4	3	1	-	8	-	-	-	8	2	7	1	3	4	4	-	7	-	-	-	-
25 - 29	12	12	11	1	1	56.3	12	9	9	9	7	1	7	8	12	2	-	-	2	7	7	7	4	1	-	12	-	-	-	10	7	11	1	9	6	6	-	11	-	-	-	-
30 - 34	9	9	9	3	1	57.8	9	6	6	8	7	2	7	7	9	-	-	-	1	7	5	6	2	1	-	9	-	-	-	8	5	6	2	8	3	4	-	8	1	-	-	-
35 - 39	8	8	6	1	-	61.3	8	6	7	7	7	2	7	7	8	-	-	-	2	4	4	6	1	1	-	8	-	-	-	6	2	7	-	7	4	1	-	8	-	-	-	-
40 - 44	9	9	9	-	-	51.7	9	4	6	6	8	6	8	5	9	2	-	-	4	4	4	7	1	1	-	9	-	-	-	5	2	8	1	9	5	3	-	7	1	-	-	-
45 - 49	10	10	9	1	1	54.0	10	6	7	7	7	6	7	10	10	3	-	-	2	5	7	6	1	3	-	10	-	-	-	8	6	7	1	9	4	-	-	10	-	-	-	-
50 - 54	5	5	4	-	-	57.0	3	3	8	3	4	3	4	4	5	2	-	-	2	3	1	1	1	3	-	5	-	-	-	3	3	5	-	4	3	5	1	5	-	-	-	-
55 - 59	6	6	5	-	-	57.5	6	3	4	4	5	3	6	4	6	4	-	-	1	4	3	6	-	-	-	6	-	-	-	5	2	6	-	2	5	1	2	6	-	-	-	-
60 - 64	3	3	3	-	-	55.0	3	1	1	1	3	3	3	3	3	2	-	-	1	-	2	2	-	1	-	3	-	-	-	2	-	3	-	2	2	1	1	3	-	-	-	-
65 - 69	3	3	3	-	-	56.7	3	3	3	3	3	3	3	3	3	-	-	-	1	1	2	-	-	3	-	3	-	-	-	2	2	1	-	3	-	2	1	3	-	-	-	-
70 - 74	1	1	-	-	-	50.0	1	-	1	1	1	1	1	1	1	-	-	-	1	-	-	1	-	-	-	1	-	-	-	1	-	1	1	1	-	-	1	-	-	-	-	-
75 +	2	2	2	-	-	42.5	1	-	-	1*	1	2	2	2	2	2	-	-	1	1	-	-	1	1	-	2	-	-	-	1	-	1	-	1	-	-	1	1	-	-	-	-
Total	171	171	162	24	4	52.4	126	48	57	62	7	86	37	87	85	86	17	-	3	42	109	93	128	24	19	-	170	1	1	-	133	34	133	12	86	76	108	5	99	3	-	-
Percent			94.7	14.6	2.3	7.23 gm/100 ml	73.7	38.1	33.3	36.3	11.3	50.3	21.6	50.9	49.7	50.3	9.9	-	1.8	24.6	63.7	54.4	74.9	14.0	11.1	-	99.4	0.6	0.6	-	77.8	19.8	77.8	7.0	50.3	44.4	63.2	2.9	57.5	1.8	-	-

\* Mazettis Test Positive



TABLE 48

## CLINICAL DATA, KAMASUNDU

## FEMALES

AGE	PARASITAEMIA					ONCHOCERCIASIS					DENTITION				EYES			HAIR	LIPS			TONGUE				BONES				NUTRITION			ILLNESS			ULCERS		SCARS		HERNIAE		SKIN	
	Persons	Blood Film Taken	Plasmodium Falciparum Present	Gametocytes Present	Acanthocheilonema Perstans	Mean Haemoglobin Percent	Skin snip taken	mf.o. volvulus present	Nodules positive	Onchocerciasis Positive	Onchodermatitis Present	Caries	Missing	D.M.F.	Gingivitis	Opacities in eyes	Abnormal	Blind	Hypochochrometria	Normal	Cheilosis	Angular Stomatitis	Normal	Glossitis	Fissured	Geographical	Normal	Bossed Skull	Beaded Ribs	Bow legs	Nutritional Deficiency Present	V.D. Present or Past	Complains of Illness	Ulcers Present	Vaccination	Other	Umbilical	Other	Lichenified	Depigmented	Loss Elasticity	Xerosis	
Under 1	6	6	4	1	-	48.3	-	-	-	-	-	-	-	-	-	-	-	-	6	-	-	6	-	-	-	6	-	-	-	-	-	4	-	-	-	5	-	-	-	-	-	-	-
1 - 4	32	32	32	7	-	50.0	2	-	-	-	7	1	7	5	-	-	1*	22	6	23	18	30	2	-	-	31	-	-	1	28	-	32	2	8	8	31	-	5	-	-	-	-	-
5 - 9	18	18	18	4	-	50.6	17	-	1	1	10	4	10	5	-	-	-	13	1	15	14	15	3	-	-	18	-	-	-	18	-	16	-	8	10	15	-	5	-	-	-	-	-
10 - 14	6	6	6	-	-	60.8	6	-	-	-	-	-	-	-	1	-	-	4	-	6	5	5	1	-	-	6	-	-	-	6	-	4	1	2	4	6	-	2	-	-	-	1	
15 - 19	11	11	11	2	-	47.3	11	2	2	3	1	-	1	-	11	1	-	-	-	11	10	8	2	1	-	11	-	-	-	11	-	9	-	9	8	5	-	9	-	-	-	-	-
20 - 24	20	20	19	2	-	51.5	20	3	8	8	6	4	7	5	20	1	-	-	2	16	9	14	3	2	1	20	-	-	-	18	-	17	1	13	12	8	-	9	-	-	-	-	
25 - 29	21	21	19	2	-	59.5	20	6	9	11	16	9	17	10	21	-	-	-	3	15	13	14	4	2	2	21	-	-	-	18	-	17	-	14	14	11	-	14	1	-	-	-	
30 - 34	15	15	12	1	1	54.0	15	5	11	11	14	9	14	11	14	2	-	-	3	11	6	11	1	3	1	15	-	-	-	12	-	13	-	11	10	9	-	8	2	-	-	-	
35 - 39	8	8	7	-	-	55.6	8	3	3	3	4	1	4	3	8	-	-	-	1	7	4	8	-	-	-	8	-	-	-	7	-	6	-	7	4	2	-	4	-	-	-	-	
40 - 44	8	8	6	-	-	58.8	8	3	7	7	7	5	7	7	8	3	-	-	3	4	5	4	2	2	-	8	-	-	-	6	-	8	-	7	5	1	-	7	-	-	-	-	
45 - 49	15	15	15	1	-	56.7	15	3	11	12	14	11	14	13	15	4	-	-	1	11	9	7	4	3	1	15	-	-	-	14	-	15	1	9	8	2	-	12	1	-	-	-	
50 - 54	5	5	5	-	-	63.0	4	2	3	3	4	4	4	5	5	3	-	-	2	2	2	3	2	-	-	5	-	-	-	4	-	5	-	3	3	-	-	5	-	-	-	-	
55 - 59	13	13	10	-	-	55.4	13	3	9	9	13	12	13	9	13	6	-	-	1	10	11	6	1	6	-	13	-	-	-	12	-	12	-	7	6	1	-	13	-	-	-	-	
60 - 64	1	1	1	-	-	50.0	1	-	1	1	1	1	1	1	1	-	1	-	-	1	1	-	1	-	-	1	-	-	-	1	-	1	-	-	-	-	-	1	-	-	-	-	
65 - 69	4	4	3	-	-	57.5	4	2	2	2	4	4	4	4	4	2	-	-	2	2	1	3	-	-	1	4	-	-	-	2	-	4	-	3	1	1	-	4	-	-	-	-	
70 - 74	5	5	3	-	-	63.0	5	2	4	5	5	4	5	4	5	2	1	-	2	2	2	-	1	4	-	5	-	-	-	3	-	5	-	5	4	1	-	4	1	-	1	-	
75 +	5	4	2	-	-	56.3	4	1	2	2	4	4	4	2	5	5	-	-	1	4	3	4	1	-	-	5	-	-	-	4	-	5	-	4	-	-	-	4	2	1	-	-	
Total	193	192	173	20	1	54.1	153	35	73	78	4	110	73	112	84	131	29	3	39	34	140	113	38	28	23	6	192	-	-	1	164	-	173	5	111	97	98	-	106	7	1	2	
Percent			90.1	11.6	0.5	7.5 gm/100ml	79.3	22.9	37.8	40.4	5.1	57.0	37.8	58.0	43.5	67.9	15.0	1.6	20.2	17.6	72.5	58.5	71.5	14.5	11.9	3.1	99.5	-	-	0.5	85.0	-	89.6	2.6	57.5	50.3	50.8	-	54.9	3.6	0.5	1.0	

\* Left eye only

TABLE 49

## CLINICAL DATA, KAMASUNDU

TOTAL

AGE	Persons			PARASITAEMIA				ONCHOCERCIASIS				DENTITION			EYES			HAIR		LIPS			TONGUE				BONES			NUTRITION			ILLNESS		ULCERS		SCARS		HERNIAE		SKIN			
	M	F	T	Blood Film Taken	Plasmodium Falciparum Present	Gameteocytes Present	Ananthocheilonema Perstans	Mean Haemoglobin Percent	Skin snip taken	mf. o. volvulus Present	Nodules Positive	Onchocerciasis Positive	Onchodermatitis	Caries	Missing	D.M.F.	Gingivitis	Opacities in Eyes	Abnormal	Blind	Hypotrichia	Normal	Cheilosis	Angular Stomatitis	Normal	Glossitis	Fissured	Geographical	Normal	Bossed Skull	Beaded ribs	new legs	Nutritional Deficiency Present	V.D. Present or Past	Complains of Illness	Ulcers Present	Vaccination	Other	Umbilical	Other	Lichenified	Depigmented	Loss Elasticity	Xerosis
Under 1	9	6	15	15	11	2	-	50.0	-	-	-	-	-	-	-	-	-	-	-	-	15	-	-	15	-	-	-	15	-	-	-	-	3	-	-	-	-	14	-	-	-	-	-	
1 - 4	36	32	68	68	68	18	-	48.3	6	-	-	-	11	1	11	9	-	-	1	24	20	41	37	65	3	-	-	66	1	1	1	54	-	61	4	14	16	61	-	6	-	-	-	
5 - 9	32	16	50	50	50	6	1	50.6	48	1	1	2	-	28	8	28	24	1	-	13	2	44	36	38	10	2	-	50	-	-	-	49	-	39	2	23	28	47	-	20	-	-	-	
10 - 14	10	6	16	16	16	-	-	54.7	16	1	2	2	-	3	-	3	2	4	-	5	-	16	11	12	3	1	-	16	-	-	-	16	-	11	1	7	10	13	-	8	-	-	1	
15 - 19	8	11	19	19	19	5	-	49.5	19	5	6	8	-	4	-	4	2	18	1	-	-	19	15	16	2	1	-	19	-	-	-	19	2	17	1	12	14	8	-	16	-	-	-	
20 - 24	8	20	28	28	27	3	-	53.6	28	5	12	12	15	10	5	11	29	27	1	-	-	2	24	15	18	6	3	1	28	-	-	-	26	2	24	2	16	16	12	-	16	-	-	-
25 - 29	12	21	33	33	30	3	1	58.3	32	15	18	20	-	23	10	24	18	33	2	-	-	5	22	20	21	8	3	2	33	-	-	-	28	7	28	1	23	20	17	-	25	1	-	-
30 - 34	9	15	24	24	21	4	2	55.4	24	11	17	19	1	21	11	21	18	23	2	-	-	4	18	11	17	3	4	1	24	-	-	-	20	5	19	2	19	13	13	-	16	3	-	-
35 - 39	8	8	16	16	13	1	-	58.4	16	9	10	10	2	11	3	11	10	16	-	-	-	3	11	8	14	1	1	-	16	-	-	-	13	2	13	-	14	8	3	-	12	-	-	-
40 - 44	9	8	17	17	15	-	-	55.0	17	7	13	13	1	15	11	15	12	17	5	-	-	7	8	9	11	3	3	-	17	-	-	-	11	2	16	1	16	10	4	14	1	-	-	-
45 - 49	10	15	25	25	24	2	1	55.6	25	9	18	19	1	21	17	21	23	25	7	-	-	3	16	16	13	5	6	1	25	-	-	-	22	6	22	2	18	12	2	-	22	1	-	-
50 - 54	5	5	10	10	9	-	-	60.0	7	5	6	6	-	8	7	8	9	10	5	-	-	4	5	3	4	3	3	-	10	-	-	-	7	3	10	-	7	6	5	1	10	-	-	-
55 - 59	6	13	19	19	15	-	-	56.1	19	6	13	13	1	18	15	19	13	19	10	-	-	2	14	14	12	1	6	-	19	-	-	-	17	2	18	-	9	11	2	2	19	-	-	-
60 - 64	3	1	4	4	4	-	-	53.8	4	1	2	2	1	4	4	4	4	4	2	1	-	1	1	3	2	1	1	-	4	-	-	-	3	-	4	-	3	2	1	1	4	-	-	-
65 - 69	3	4	7	7	6	-	-	57.2	7	5	5	5	2	7	7	7	7	7	2	-	-	3	3	3	3	-	3	1	7	-	-	-	4	2	5	-	6	1	3	1	7	-	-	-
70 - 74	1	5	6	6	3	-	-	60.8	6	2	5	6	1	6	5	6	5	6	2	1	-	3	2	2	1	1	4	-	6	-	-	-	3	1	5	1	6	5	1	-	5	1	-	1
75 +	2	5	7	6	4	-	-	51.7	5	1	2	3	1	6	6	6	4	7	7	-	-	2	5	3	4	2	1	-	7	-	-	-	5	-	6	-	4	1	-	-	5	3	1	-
Total	171	193	364	363	335	44	5	53.3	279	83	130	140	11	196	110	199	169	217	46	3	42	76	249	206	266	52	42	6	362	1	1	1	297	34*	306	17	197	173	206	5	205	10	1	2
Percent	47.0	53.0		92.0	13.1	1.4		7.4 gm/100ml	16.6	29.7	35.7	38.5	7.9	53.8	30.2	54.7	46.4	59.6	12.6	0.8	11.5	20.9	68.4	56.6	73.1	14.3	11.5	1.6	99.5	0.3	0.3	0.3	81.6	19.8	84.1	4.7	54.1	47.5	56.6	1.4	56.3	2.7	0.3	0.5

\* Males only

and females, but adults spleen rates differ, males being 51% and females being 77%.

Acanthocheilonema perstans

Was seen in 1.4% of the population. *Acanthocheilonema streptocerca* was recognised in a male aged 18. This microfilaria is smaller than that of *O. volvulus*, the anterior extremity is not dilated and the tail is not crooked.

Onchocerciasis

36.3% of males and 40.4% of females were positive for onchocerciasis.

These rates are much lower than those for Masimera and are related to the distance of Kamasundu from the Rokel River. The rate for both sexes is 38.5%.

The youngest persons with nodules in Kamasundu were a male aged 12, and a female aged 7. The youngest with positive skin snips were a male aged 7 and a female aged 19.

The great trochanter and the iliac crests are the commonest sites for onchocerciasis..

49.3% of persons had one nodule only. One male aged 75, had neither nodules, nor micro-filaria in the skin, on one skin snip, but he was positive by Mazotti's test, using 50 mgm diethylcarbamazine (Banocide).

Three cases of hydrocoele were seen in males.

#### Dentition

The D.M.F. rates are 49.7% for males and 58.0% for females.

49.7% of males and 43.5% of females had gingivitis.

#### Eyes

There was one female aged 2 who was blind in the left eye only. 2 adult females were blind in both eyes, ages 63 and 70. Both had onchocerciasis and blindness was probably due to this disease.

The uniform opacities were seen in 50.3% of males and 67.9% of females. Abnormal vision was complained of by 9.9% of males and 15.0% of females. All were over 15 years of age.

#### Hypochromotrichia

This was seen in 1.8% of males and 20.2% of females. The great sex difference was noted as in Masimera.

#### Nutritional Deficiency

Using the same criteria as before 77.8% of males and 85.0% of females were suffering or had suffered from a nutritional deficiency. One male aged 3 and one female aged 1 were marasmic. There was one female, aged 2, with Kwashiorkor.

#### Ulcers

These were seen in 7.0% of males and 2.6% of females.

MALARIA

Table 50

KAMASUNDU

Both Sexes N = 364

Class of spleen	Age group				
	0 - 1	2 - 4	5 - 9	10-14	Adults
0	6	-	-	-	70
1	2	1	9	4	66
2	1	11	18	9	64
3	8	32	21	2	14
4	6	15	2	1	1
5	1	-	-	-	-

Both sexes Spleen rate 2 - 9 years = 100% Adult = 67%

Males N = 171

Class of spleen	Age group				
	0 - 1	2 - 4	5 - 9	10-14	Adults
0	4	-	-	-	41
1	1	1	4	4	29
2	1	4	13	5	10
3	5	16	15	1	4
4	3	9	-	-	-
5	1	-	-	-	-

Males Spleen rate 2 - 9 years = 100% Adult = 51%

Females N = 193

Class of Spleen	Age group				
	0 - 1	2 - 4	5 - 9	10-14	Adults
0	2	-	-	-	29
1	1	-	5	-	37
2	-	7	5	4	54
3	3	16	6	1	10
4	3	6	2	1	1
5	-	-	-	-	-

Females Spleen rate 2 - 9 years = 100% Adult = 77%

Table 51

KAMASUNDU      Frequency of Site of Onchocercomata

Site of Onchocercomata	Males	Females	Total	%
Sacrum	21	12	33	19.2%
Gt. Trochanter	37	56	93	54.1%
Iliac crests	20	24	44	25.6%
Thorax (scapula)	1	-	1	0.5%
Head	-	-	-	
Legs	-	-	-	
Groin	1	-	1	0.5%
	80	92	172	

Table 52

Number of Onchocercomata per person

Number of Onchocercomata	Males	Females	Total	%
1	26	41	67	49.3%
2	13	11	24	17.6%
3	8	9	17	12.5%
4	4	6	10	7.4%
5	5	5	10	7.4%
6	2	2	4	2.9%
7	1	-	1	0.7%
8	1	-	1	0.7%
9	-	-	-	
10+	2	-	2	1.5%
	62	74	136	

Vaccination

54.1% of both sexes had been vaccinated.

Venereal Disease

19.8% of all males were suffering from, or had previously suffered from one or more attacks of urethral discharge, almost certainly gonorrhoea. 3 had active gonorrhoea diagnosed clinically.

40.5% of males of 15 years and over had or had had venereal disease.

Other Conditions

Many other conditions were seen during the course of the survey, among which were the following:-

	Males	Females	Total
1. Deaf	-	1 (age 55)	1
2. Dental Abscess	2	1	3
3. Diarrhoea	4	1	5
4. Dupuytens contracture	1	1	2
5. Epilepsy	1 (Age 40)	-	1
6. Hemiplegia	1	1	2
7. Hydrocele	3	-	3
8. Injury	10	5	15
9. Leprosy	2	1	3
10. Marasmus	1	1	2
11. Measles	10	10	20
12. Measles with broncho-pneumonia	4	2	6
13. Measles with otitismedia	2	-	2
14. Mentally defective	-	1 (Age 30)	1
15. Poliomyelitis, paralysis	1	-	1
16. Post encephalitic state	1	-	1
17. Sarcoma jaw	-	1	1
18. Scabies	-	1	1
19. Sepsis	6	6	12
20. Speech defect	1 (Age 7)	-	1
21. Talipes equino-varus	-	1	1
22. Worms	37	27	64
	106	66	172

Patients seen outside the sample at Kamasundu.

During the 12 working days in Kamasundu 252 patients were seen.

Age in years	Males	Females	Total
Under 1	4	8	12
1 - 4	15	29	44
5 - 9	18	1	19
10 - 14	5	3	8
15 - 19	4	3	7
20 - 24	6	5	11
25 - 29	6	2	8
30 - 34	26	13	39
35 - 39	2	7	9
40 - 44	8	9	17
45 - 49	3	8	11
50 - 54	28	18	46
55 - 59	1	3	4
60 - 64	9	5	14
65 - 69	1	-	1
70 - 74	2	-	2
75 plus	-	-	-
	138	114	252



Clinical Conditions noted

1. Ainhum	1
2. Blind	3
3. Breast abcess	1
4. Congenital Heart	1
5. Constipation	5
6. Eliphantiasis.	3
7. Entropion	1
8. Epidermophytosis	1
9. Epilepsy	1
10. Gonorrhoea	9
11. Hernia Inguinal	3
12. Injury.	8
13. Leprosy.	3
14. Malaria.	101
15. Marasmus.	1
16. Measles broncho-pneumonia	30
17. Onchocerciasis	17
18. Onchocerciasis with eye involvement	10
19. Otitis	9
20. Pertussis	6
21. Pregnancy	1
22. Renal stone.	1
23. Sarcoma of jaw	2
24. Scabies.	1

25. Sepsis and Ulcers	38
26. Sickle cell anaemia -F. 6m slightly jaundiced with bossed skull. 4th digits swollen	1
27. Sinusitis	2
28. Suprapubic cystotomy	1
29. Tuberculosis	4
30. Vitiligo	1
31. Vomiting and Diarrhoea	7
32. Worms	15
33. Yaws	3
	<hr/>
	291

#### 11.2.10. Physiological Data

'Haemoglobin' % taken by the Tallqvist method was the only measurement made. The mean haemoglobin level for males was 7.2 gms/100 ml and for females 7.5 gms/100 ml.

#### 11.2.11. Fertility and Survival

Fertility and Survival and the ages at which children died are set out in tables 53 and 54.

##### Fertility.

There were 18 live births, 11 males and 7 females, in the year under review in a population of 364 (171 males, 193 females).

The Crude Birth Rate is 49.4 per 1000

TABLE 53

## FERTILITY AND SURVIVAL, KAMASUNDU.

FEMALES.

Age	Persons	Live Births			Stillbirths			Live Births in Last Year			Stillbirths in Last Year			Live Births dying within Year			Multiple Pregnancies	Abortions	Children Dying			Non-Fertile Married Females	One Pregnancy Only
		M	F	T	M	F	T	M	F	T	M	F	T	M	F	T			M	F	T		
15 - 19	11	1	1	2	-	-	-	1	-	1	-	-	-	-	-	-	-	-	1	1	5	3	
20 - 24	20	21	17	38	8	3	11	5	2	7	-	-	-	2	-	2	(1 Still MM)	3	11	6	17	3	4
25 - 29	21	38	37	75	3	5	8	3	5	8	-	-	-	-	-	-	2 Twins MF MF (1 Still MF)	7	24	11	35	-	-
30 - 34	15	24	28	52	3	2	5	1	-	1	1	-	1	-	-	-	1 Twins MF	8	5	9	14	2	1
35 - 39	8	22	13	35	3	1	4	-	-	-	-	-	-	-	-	-	-	1	10	7	17	1	1
40 - 44	8	21	28	49	5	-	5	-	-	-	-	-	-	-	-	-	1 Twins FF (1 Still MM)	7	9	13	22	-	-
45 - 49	15	46	31	77	6	4	10	1	-	1	-	-	-	-	-	-	-	9	21	14	35	1	4
50 - 54	5	13	15	28	1	-	1	-	-	-	-	-	-	-	-	-	-	2	6	5	11	-	-
55 - 59	13	51	27	78	4	5	19	-	-	-	-	-	-	-	-	-	3 Twins 2 FF 1 MF (2 Still MM MF)	5	19	18	37	-	-
60 - 64	1	4	3	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	4	-	-
65 - 69	4	16	8	24	-	1	1	-	-	-	-	-	-	-	-	-	-	1	12	3	15	-	-
70 - 74	5	20	12	32	3	1	4	-	-	-	-	-	-	-	-	-	1 Twins MM (1 Still MM)	4	11	7	18	-	-
75+	5	17	14	31	1	1	2	-	-	-	-	-	-	-	-	-	1 Twins MM	2	9	10	19	-	-
TOTAL	131	294	234	528	37	23	60	11	7	18	1	-	1	2	-	2	9 Twins (6 Still )	49	141	104	245	12	9

TABLE 54

## AGES AT WHICH CHILDREN DIED, KAMASUNDU.

FEMALES.

Age Group of Mother	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 - 59	60 - 64	65 - 69	70 - 74	75+	TOTAL	
N	11	20	21	15	8	8	15	5	13	1	4	5	5	131	
Age at Death	Number of Children Dying														%
0 - 1m	-	6	5	2	2	5	1	1	3	-	2	-	-	27	11.0
2m-12m	-	5	8	6	6	5	12	2	14	2	3	3	8	74	30.2
Under 1	-	11	13	8	8	10	13	3	17	2	5	3	8	101	41.2
1 - 4	1	6	19	6	5	10	18	6	11	2	5	1	4	94	38.4
5 - 9	-	-	3	-	2	2	-	-	5	-	1	1	2	16	6.5
10- 14	-	-	-	-	2	-	1	1	-	-	1	3	-	8	3.3
15- 19	-	-	-	-	-	-	2	1	4	-	3	4	3	17	6.9
20+	-	-	-	-	-	-	1	-	-	-	-	6	2	9	3.7
TOTAL	1	17	35	14	17	22	35	11	37	4	15	18	19	245	100.0

### Fertility Rate

There were 98 females in the age groups 15 - 49 in Kamasundu. In the year under review there were 18 live births a General Fertility Rate of 183.6 per 1000.

79 females, aged 30 years, and over, gave birth to 413 live births. The mean number of children born alive to each female in these age groups is therefore 5.2.

Of the 98 females in the reproductive age group, 3 were single (3.0%), 3 were widowed and 2 separated. One woman was three times married having been divorced twice for sterility.

Of the 95 females who were married or had been married 11 (11.5%) had never been pregnant.

### Family Size.

From the distribution of ever-married women by number of children born alive (Table 54a) it can be seen that 19% of women 30 and over had 8 children and 15.1% had 4 and 5 children respectively.

For women of completed fertility the distribution of numbers of children born alive tends to be high. The average number of children born alive to married females of completed fertility was 5.8.

### Sterility

Of the 12 non-fertile married females, one had been

Table 54A

Distribution of Ever-married Women by number of children born alive

Present age of women	Number of women with the following number of children born alive												Total number of women.	
	0	1	2	3	4	5	6	7	8	9	10	11		12+
15 - 29	10	11	5	8	8	5	1	1	-	-	-	-	-	49
30 - 44	3	6	2	1	4	3	4	1	5	1	-	-	1	31
45 and over	1	4	2	1	8	9	3	3	10	3	2	1	1	48
TOTAL	14	21	9	10	20	17	8	5	15	4	2	1	2	128

married 1 year, 2 married 2 years, one each married for 3, 4, 5, 6 and 7 years. One was married for 10, one for 15 and one for 25 years.

Thus 4 were sterile in the reproductive age groups, a rate of 4.0%.

9 females (6.8%) had had one pregnancy only in the age groups 15 years and over.

The youngest married female was 16 years old.

The duration of married compared with the duration of cohabitation was investigated at Kamasundu.

In the 15 - 19 age groups the following examples were noted:-

Number of years married	Number of years cohabiting with husband
8	5
2	2 months
5	1
2	1 week
1	1

#### Multiple Pregnancy Rate

There were 9 sets of live twins. 6 sets of twins were stillborn.

Out of 528 live births there were 9 multiple pregnancies, a Multiple Pregnancy Rate of 17 per 1000.

2 sets of twins were males, 3 sets were females and 4 sets were males and females.

### Sex Ratio at Birth

Using total live births of all females in Kamasundu, the Sex Ratio is 125 live born males per 100 females.

### Survival

In the absence of any registration it was not possible to ascertain death rates.

From table 54 the proportional rates for the children who died may be calculated. Infant deaths - Toddler deaths ratio is 1.06.

11.0% of the children who died in Kamasundu were under 1 month and 41.2% were under 1 year.

### Infant Mortality Rate

2 out of the 18 children born in the last year died during the year.

The Infant Mortality Rate is 111.1 per 1000.

Basing the calculation on all the females in the village using the total number of live births 528 and the number who died under 1 year of age, 101, the mortality rate for these infants is 191.2 per 1000.

### Stillbirth Rate

There was only 1 stillbirth during the last year, among 19 live and stillbirths, a rate of 52 per 1000.

There were 60 stillbirths recorded out of 588 live and stillbirths among the group of women investigated, a proportion of 102 per 1000 births live and still.



### Abortions

129 females in Kamasundu who were married or had been married had 49 abortions, a rate of 0.38 per female. There were 76.9 abortions per 1000 pregnancies.

### Commentary

Kamasundu is the village the least affected by transport, goods and services, etc., from outside and represents rural Sierra Leone at the subsistence level.

#### 11.3. Mawulay-Mamanso.

This is a small village situated a few yards from the north bank of the Rokel River at the point where the Lunsar-Marampa-Masimera road crosses the river by man hauled ferry. The village is 7 miles from the S.L.D.C. mines. It is in the Marampa-Masimera Chiefdom.

The village is an old one and has been at a crossing place on the river for a long time. The new pontoon-type man hauled ferry was installed in June 1960, and now lorries are able to go as far as Masimera.

The ferry is paid for and maintained by the Public Works Department and no charge is made for passage for passengers or lorry.

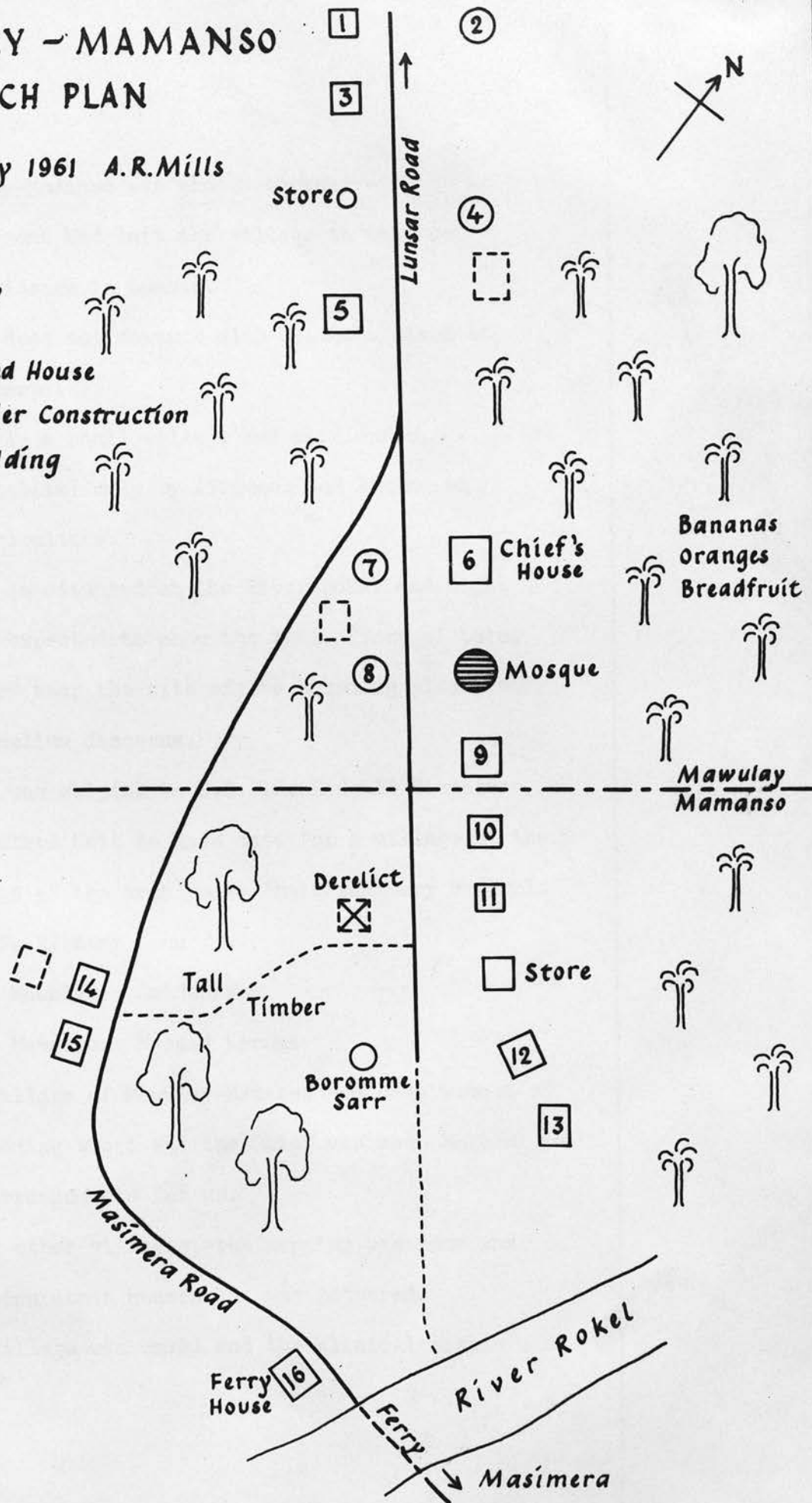
The village consists of two sections divided as shown on the sketch plan. The division is an ancient one which is perpetuated administratively.

# MAWULAY - MAMANSO SKETCH PLAN

31st January 1961 A.R. Mills

- Road
- - - Boundary
- - - Footpath
- ○ Inhabited House
- House Under Construction
- ▨ Public Building

500 yards long approx.



Mawulay-Mamanso was chosen because:-

1. Persons had left the village to take up residence in Lunsar.
2. It does not commute with S.L.D.C. mines at Marampa.
3. It is a small village and an old one, inhabited only by Africans and living on agriculture.
4. It is situated on the River Rokel and might be expected to show the full effect of being very near the site of the breeding places of *Simulium damnosum*.
5. It was helpful to S.L.D.C. Endemic Diseases Control Unit to have data for a village at the edge of the area under their sanitary control.

Chief: Pa Alimamy Kanu

Headman, Mawulay: Saidu Kanu

Headman, Mamanso: Hasana Koroma

The village of Mawulay-Mamanso had been warned of our impending visit and the Chief was most helpful in making arrangements for us.

As in other villages, the mapping was done and information about households was gathered.

The village was small and the clinical sample was total.

7 Bundu girls aged 5 - 14 were away being initiated at the time of the examination.

#### 11.3.1. Housing.

There are 16 houses in Mawulay-Mamanso, 15 (93.7%) of which are inhabited. One household had moved to the diamond area. 4 of these are round (25%) and 12 are rectangular in shape. 12 (75%) are of thatch, mud and sticks. 4 (25%) have corrugated iron roofs. One house is rented and all the rest are owned by the occupiers. There were 75 rooms in the 16 houses a mean of 4.7 per house, 71 rooms being inhabited by 129 persons, a density of 8.6 persons per house, 1.8 persons per room and 10.7 persons per Separate Family Unit. There were 12 Separate Family Units present in the village, i.e., 0.8 Separate Family Units per house.

#### Overcrowding.

5.4% of the population is under 1 year and 33.3% is between 1 and 10 years. The factor is thus 22% approximately.

3 houses out of 15, i.e., 20% were overcrowded.

#### Latrines.

There were 4 latrines, 25% of houses had latrines. One for every 32 persons.

5 houses had food gardens.

#### 11.3.2. Water Supply is from the Rokel River.

11.3.3. Rubbish Disposal. Burning, burying or putting on gardens.

11.3.4. Medical and Sanitary Services

There is no dispensary in Mawulay-Mamanso. The midwife from Masimera visits the village, but usually the mother or grandmother helps in a confinement. Sick persons go to Lunsar if necessary. There are no mentally deranged or physically handicapped in the village except for 3 blind persons.

Simulium damnosum bites frequently. It is called Mape'is in Temne. During the rainy season it bites all day, but in the dry season usually bites before 10 a.m. and after 4 p.m.

11.3.5. School

There is none in the village. Some children go to school in Lunsar. The Koranic School in the village is taken by Chief Pa Alimamy Kanu. The boys are taught cleanliness and the use of the chewing stick is included in this teaching.

11.3.6. Shops. None. An itinerant vendor of head ties, with a bicycle, was seen to visit the village. Shopping is done in Lunsar.

11.3.7. Census Data. Mawulay-Mamanso

This is set out in Tables 55, 56 and 57.

TABLE 55

MALES.

CENSUS DATA, MAWULAY-MAMANSO.

Age	Persons	Civil State					Tribe						Born in Village	Occupation							Religion				Literacy	
		Single	Married	Widowed	Divorced	Separated	Temne	Mende	Fulah	Limba	Creole	Other		House	Farmer	Trader	Industry	School	Koranic School	Child or None	Muslim	R.C.	Protestant	Pagan	Literate	Arabic
Under 1	5	5	-	-	-	-	5	-	-	-	-	-	4	-	-	-	-	-	5	5	-	-	-	-	-	-
1 - 4	7	7	-	-	-	-	7	-	-	-	-	-	4	-	-	-	-	-	7	7	-	-	-	-	-	-
5 - 9	10	10	-	-	-	-	10	-	-	-	-	-	8	-	9	-	-	-	4	1	10	-	-	-	-	-
10 - 14	6	6	-	-	-	-	6	-	-	-	-	-	4	-	6	-	-	-	2	-	6	-	-	-	-	-
15 - 19	3	3	-	-	-	-	3	-	-	-	-	-	2	-	3	-	-	-	2	-	3	-	-	-	-	-
20 - 24	2	1	1	-	-	-	2	-	-	-	-	-	2	-	2	-	1	-	-	-	2	-	-	-	-	-
25 - 29	4	1	3	-	-	-	4	-	-	-	-	-	1	-	4	-	2	-	3	-	4	-	-	-	-	-
30 - 34	3	-	2	1	-	-	3	-	-	-	-	-	1	-	3	-	-	-	1	-	3	-	-	-	-	-
35 - 39	5	-	5	-	-	-	3	-	1	1	-	-	3	-	3	1	1	-	-	-	5	-	-	-	-	-
40 - 44	3	-	3	-	-	-	3	-	-	-	-	-	1	-	3	-	1	-	1	-	3	-	-	-	-	-
45 - 49	2	1	1	-	-	-	2	-	-	-	-	-	2	-	2	-	-	-	-	-	2	-	-	-	-	-
50 - 54	2	-	1	-	-	1	2	-	-	-	-	-	1	-	2	-	-	-	-	-	1	-	-	1	-	-
55 - 59	1	-	1	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-
60 - 64	1	-	1	-	-	-	1	-	-	-	-	-	1	-	1	-	-	-	-	-	1	-	-	-	-	-
65 - 69	1	-	1	-	-	-	1	-	-	-	-	-	1	-	1	-	-	-	-	-	1	-	-	-	-	-
70 - 74	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
75+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	55	34	19	1	-	1	53	-	1	1	-	-	35	-	40	1	5	-	13	13	54	-	-	1	-	-
%		61.8	34.5	1.8	-	1.8	96.4	-	1.8	1.8	-	-	63.6	-	72.7	1.8	9.1	-	23.6	23.6	98.2	-	-	1.8	-	-

TABLE 56.

## FEMALES

## CENSUS DATA, MANULAY-MAMANSO.

Age	Persons	Civil State					Tribe						Born in Village	Occupation							Religion				Literacy		
		Single	Married	Widowed	Divorced	Separated	Temne	Mende	Fulah	Limba	Creole	Other		House	Farmer	Trader	Industry	School	Koranic School	Child or None	Muslim	R.C.	Protestant	Pagan	Literate	Arabic	
Under 1	2	2	-	-	-	-	2	-	-	-	-	-	2	-	-	-	-	-	-	2	2	-	-	-	-	-	-
1 - 4	14	14	-	-	-	-	13	-	-	1	-	-	8	-	2	-	-	-	-	14	13	-	-	1	-	-	-
5 - 9	12	12	-	-	-	-	11	-	1	-	-	-	8	4	11	-	-	-	1	1	10	-	-	2	-	-	-
10 - 14	1	-	1	-	-	-	1	-	-	-	-	-	-	1	1	-	-	-	1	-	1	-	-	-	-	-	-
15 - 19	2	-	2	-	-	-	2	-	-	-	-	-	1	2	2	-	-	-	-	-	1	-	-	1	-	-	-
20 - 24	2	-	2	-	-	-	2	-	-	-	-	-	2	2	2	-	-	-	-	-	2	-	-	-	-	-	-
25 - 29	9	-	8	1	-	-	9	-	-	-	-	-	3	6	9	1	-	-	-	-	8	-	-	1	-	-	-
30 - 34	7	-	6	-	1	-	7	-	-	-	-	-	2	7	7	-	-	-	1	-	7	-	-	-	-	-	-
35 - 39	3	-	3	-	-	-	3	-	-	-	-	-	2	2	3	-	-	-	-	-	2	-	-	1	-	-	-
40 - 44	7	-	7	-	-	-	7	-	-	-	-	-	1	7	6	1	-	-	1	-	7	-	-	-	-	-	-
45 - 49	2	-	1	1	-	-	2	-	-	-	-	-	1	1	2	-	-	-	-	-	2	-	-	-	-	-	-
50 - 54	2	-	2	-	-	-	2	-	-	-	-	-	-	2	2	-	-	-	1	-	2	-	-	-	-	-	-
55 - 59	2	-	-	2	-	-	2	-	-	-	-	-	1	1	2	-	-	-	-	-	2	-	-	-	-	-	-
60 - 64	5	-	3	2	-	-	5	-	-	-	-	-	1	3	5	-	-	-	2	-	4	-	-	1	-	-	-
65 - 69	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
70 - 74	2	-	-	2	-	-	2	-	-	-	-	-	2	2	2	-	-	-	-	-	2	-	-	-	-	-	-
75+	2	-	-	1	-	1	2	-	-	-	-	-	2	2	-	-	-	-	-	-	2	-	-	-	-	-	-
TOTAL	74	28	35	9	1	1	72	-	1	1	-	-	36	39	56	2	-	-	7	17	67	-	-	7	-	-	-
Percent		37.8	47.3	12.2	1.4	1.4	97.2	-	1.4	1.4	-	-	48.6	52.7	75.7	2.7	-	-	9.5	23.0	90.5	-	-	9.5	-	-	-

TABLE 57

## CENSUS DATA, MAWULAY - MAMANSO

Age	Persons			Group as % total	Civil State					Tribe					Born in Village	Occupation							Religion				Literacy		
	M	F	T		Single	Married	Widowed	Divorced	Separated	Temne	Mende	Fulah	Limba	Creole		Other	House	Farmer	Trader	Industry	School	Koranic School	Child or None	Muslim	R.C.	Protestant	Pagan	Literate	Arabic
Under 1	5	2	7	5.4	7	-	-	-	-	7	-	-	-	-	6	-	-	-	-	-	7	7	-	-	-	-	-	-	
1 - 4	7	14	21	16.3	21	-	-	-	-	20	-	-	1	-	12	-	2	-	-	-	21	20	-	-	1	-	-	-	
5 - 9	10	12	22	17.0	22	-	-	-	-	21	-	1	-	-	16	1	20	-	-	-	5	2	20	-	-	2	-	-	-
10 -14	6	1	7	5.4	6	1	-	-	-	7	-	-	-	-	4	1	7	-	-	-	3	-	7	-	-	-	-	-	-
15 -19	3	2	5	3.9	3	2	-	-	-	5	-	-	-	-	3	2	5	-	-	-	2	-	4	-	-	1	-	-	-
20 -24	2	2	4	3.1	1	3	-	-	-	4	-	-	-	-	4	2	4	-	1	-	-	4	-	-	-	-	-	-	-
25 -29	4	9	13	10.1	1	11	1	-	-	13	-	-	-	-	4	6	13	1	2	-	3	-	12	-	-	1	-	-	-
30 -34	3	7	10	7.7	-	8	1	1	-	10	-	-	-	-	3	7	10	-	-	-	2	-	10	-	-	-	-	-	-
35 -39	5	3	8	6.2	-	8	-	-	-	6	-	1	1	-	5	2	6	1	1	-	-	7	-	-	1	-	-	-	-
40 -44	3	7	10	7.7	-	10	-	-	-	10	-	-	-	-	2	7	9	1	1	-	2	-	10	-	-	-	-	-	-
45 -49	2	2	4	3.1	1	2	1	-	-	4	-	-	-	-	3	1	4	-	-	-	-	4	-	-	-	-	-	-	-
50 -54	2	2	4	3.1	-	3	-	-	1	4	-	-	-	-	1	2	4	-	-	-	1	-	3	-	-	1	-	-	-
55 -59	1	2	3	2.3	-	1	2	-	-	3	-	-	-	-	1	1	3	-	-	-	-	3	-	-	-	-	-	-	-
60 -64	1	5	6	4.7	-	4	2	-	-	6	-	-	-	-	2	3	6	-	-	-	2	-	5	-	-	1	-	-	-
65 -69	1	-	1	0.8	-	1	-	-	-	1	-	-	-	-	1	-	1	-	-	-	-	1	-	-	-	-	-	-	-
70 -74	-	2	2	1.6	-	-	2	-	-	2	-	-	-	-	2	2	2	-	-	-	-	2	-	-	-	-	-	-	-
75 +	-	2	2	1.6	-	-	1	-	1	2	-	-	-	-	2	2	-	-	-	-	-	2	-	-	-	-	-	-	-
TOTAL	55	74	129		62	54	10	1	2	125	-	2	2	-	71	39	96	3	5	-	20	30	121	-	-	8	-	-	-
Percent	42.4	57.6	100		48.1	41.9	7.8	0.8	1.6	96.9	1.6	1.6	1.6	-	55.0	30.2	74.4	2.3	3.9	-	15.5	23.3	93.8	-	-	6.2	-	-	-



Population Structure.

Females are more numerous than males, there being 74 (57.6%) out of a total population of 129. 44.1% of the population are under 15 years old, and 23.7% are under 5 years old.

In the age group 20 - 39 there are only 14 males compared with 21 females.

At the time of the Survey there were 7 Bundu girls, aged 5 - 14 away from the village being initiated. These girls are not included in the census. The population under 20 is greater than the population between 20 and 40 (62:35) hence, if emigration is left out, the population will tend to increase.

Civil State

34.5% of all males and 47.3% of all females were married.

7(77.7%) out of 9 males between 20-35 years were married, one had already been widowed. All females in these age groups were married, one had been widowed and one divorced. Only one male in the 45-54 age group had not been married.

The youngest married females were aged 12 years.

Of the 19 married males, 9 (47.3%) had one wife, 5 (26.3%) had two wives, 4 (21.5%) had three wives and one (5.2%) had four wives.

57.7% of marriages were polygynous. See Table 58.

Tribe

There are only 4 (3.2%) non-Temne in the whole population, two Fulah and two Limba.

Birthplace

63.6% of the males and 48.6% of the females were born in Mawulay-Mamanso.

Religion

98.2% of males and 90.5% of females are Muslim, and the rest are pagans.

Education

No one in the village was attending or had attended school. 23.6% of males and 9.5% of females were attending or had attended the Koranic school.

Literacy

None were literate in either English or Arabic.

Occupation

'House' 52.7% of the females and no males gave this as their occupation.

'Farmer' 72.7% of males and 75.7% of females gave this as their occupation.

'Industry' There were 5 (9.1%) ferrymen who were employed by the Public Works Department to handle the ferry across the Rokel River.

No females engaged in any handicraft or manufacture.

Table 58

POLYGYNY, MAWULAY-MAMANSO

Number of wives per married male.

Married males		Number of living wives								Total Wives
Age in years	N	1	2	3	4	5	6	7	8	
15 - 19	-	-	-	-	-	-	-	-	-	-
20 - 24	1	1	-	-	-	-	-	-	-	1
25 - 29	3	1	2	-	-	-	-	-	-	5
30 - 34	2	1	1	-	-	-	-	-	-	3
35 - 39	5	2	1	2	-	-	-	-	-	10
40 - 44	3	1	-	1	1	-	-	-	-	8
45 - 49	1	-	-	1	-	-	-	-	-	3
50 - 54	1	-	1	-	-	-	-	-	-	2
55 - 59	1	1	-	-	-	-	-	-	-	1
60 - 64	1	1	-	-	-	-	-	-	-	1
65 - 69	1	1	-	-	-	-	-	-	-	1
70 - 74	-	-	-	-	-	-	-	-	-	-
75 plus	-	-	-	-	-	-	-	-	-	-
TOTAL	19	9	5	4	1	-	-	-	-	35
PERCENT		47.3	26.3	21.5	5.2					

In addition to these occupations there was one Section Chief, one village headman and one Koranic teacher.

#### 11.3.8. Clinical Data

The data extracted from the schedules are shown on Tables 59, 60, 61, 62, 63 and 64.

#### Morbidity

##### Malaria

Plasmodium falciparum was present in 96.4% of the males and 95.9% of the females. All the village was examined.

The spleen rates (Table 62) show that the 2 - 9 rate is 100% for males and females but adult spleen rates differ the rate for males being 59% but that for females being 80%.

Acanthocheilonema perstans, was seen in 3.6% of males but none was seen among the females.

##### Onchocerciasis.

60.0% of the males and 70.3% of the females were positive for onchocerciasis.

These are the highest rates recorded during the survey and are to be expected since the village is situated on the bank of the Rokel River, the breeding place of Simulium.

The youngest persons with nodules were a male aged 7, and a female aged 4. These two persons also had positive skin snips.

TABLE 59

CLINICAL DATA, MAWULAY - MAMANSO

MALES

AGE	PARASITAEMIA					ONCHOCERCIASIS					DENTITION			EYES			HAIR	LIPS			TONGUE				BONES			NUTRITION		ILLNESS		ULCERS		SCARS		HERNIAE		SKIN											
	Persons	Blood Film Taken	Plasmodium Falciparum Present	Gametocytes Present	Acanthocheilomonema Perstans	Mean Haemoglobin Percent	Skin snip taken	mf. o. volvulus Present	Modules Positive	Onchocerciasis positive	Onchodermatitis Present	Caries	Missing	D.M.F.	Gingivitis	Opacities in eyes	Abnormal	Blind	Hypochromotrichia	Normal	Cheilosis	Angular Stomatitis	Normal	Glossitis	Fissured	Geographical	Normal	Bossed Skull	Beaded Ribs	Pow legs	Nutritional Deficiency Present	V.D. Past or Present	Complaints of Illness	Ulcers Present	Vaccination Present	Other scars	Umbilical	Other	Lichenified	Depigmented	Loss Elasticity	Xerosis							
Under 1	5	5	4	3	-	49.0	-	-	-	-	-	-	-	-	-	-	-	-	5	-	-	5	-	-	-	5	-	-	-	-	-	5	-	-	-	4	-	-	-	-	-	-	-						
1 - 4	7	7	7	6	-	51.4	-	-	-	-	4	-	4	3	-	-	-	-	2	4	5	7	-	-	-	6	-	1	-	6	-	6	-	1	-	5	-	-	-	-	-	-	-						
5 - 9	10	10	10	1	-	49.5	10	1	2	2	-	-	-	-	-	-	-	-	1	9	9	10	-	-	-	10	-	-	-	-	9	-	4	-	7	3	8	-	8	-	-	-	-	-					
10 - 14	6	6	6	-	-	52.5	6	5	5	6	-	1	-	1	2	3	-	-	-	6	4	5	1	1	-	6	-	-	-	6	-	2	-	5	4	5	-	6	-	-	-	-	-						
15 - 19	3	3	3	-	-	55.0	3	2	2	2	-	1	-	1	1	3	-	-	-	2	1	3	-	-	-	3	-	-	-	3	-	3	-	3	2	2	-	3	-	-	-	-	-	-					
20 - 24	2	2	2	-	-	55.0	2	2	2	2	2	1	-	1	1	2	-	-	1	1	1	1	1	1	-	2	-	-	-	1	-	2	-	1	2	-	-	-	-	-	-	-	-	-					
25 - 29	4	4	4	-	-	55.0	4	4	4	4	1	1	-	1	1	4	1	-	1	3	2	2	-	2	-	4	-	-	-	3	3	3	-	3	3	-	-	-	-	4	1	-	-	-	-				
30 - 34	3	3	3	1	1	50.0	3	3	3	3	1	2	2	2	3	-	-	-	1	1	2	2	-	1	-	3	-	-	-	1	-	2	-	3	3	-	-	-	-	3	1	-	-	-	-				
35 - 39	5	5	4	-	-	56.0	5	5	5	5	1	4	4	4	3	5	-	-	2	3	3	4	-	1	-	5	-	-	-	3	2	4	-	4	3	-	-	-	-	4	1	-	-	-	-				
40 - 44	3	3	3	-	1	58.3	3	2	2	2	2	1	1	1	3	1	-	-	1	-	2	1	1	1	-	3	-	-	-	2	2	1	-	3	-	1	-	3	-	-	-	-	-	-	-				
45 - 49	2	2	2	1	-	50.0	2	2	2	2	2	-	-	1	2	1	-	-	-	1	2	1	-	1	-	2	-	-	-	2	-	2	-	2	-	1	-	2	-	-	-	-	-	-	-				
50 - 54	2	2	2	-	-	60.0	2	2	2	2	2	2	2	2	2	2	-	-	1	1	1	-	1	-	2	-	-	-	1	2	2	-	1	1	1	-	1	-	2	-	-	-	-	-	-	-			
55 - 59	1	1	1	-	-	60.0	1	1	1	1	1	1	-	1	1	1	-	-	-	-	1	1	-	-	-	1	-	-	-	1	1	1	-	1	1	-	-	-	-	1	-	-	-	-	-	-	-		
60 - 64	1	1	1	-	-	50.0	1	1	1	1	1	1	1	1	1	-	-	-	-	-	1	1	-	-	-	1	-	-	-	1	-	-	-	1	1	-	-	-	-	1	1	-	-	-	-	-	-		
65 - 69	1	1	1	-	-	55.0	1	1	1	1	1	1	1	1	1	-	-	-	-	1	1	1	-	-	-	1	-	-	-	1	1	1	-	-	1	1	-	1	-	1	1	-	-	-	-	-	-	-	
70 - 74	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
75 +	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	55	55	53	12	2	52.7	43	31	32	33	14	20	11	20	20	30	6	-	-	15	32	35	44	3	8	1	54	-	1	-	40	11	38	-	35	24	28	-	38	5	-	-	-	-	-	-			
Percent		100.0	96.4	22.6	3.6	7.3 gm/100ml	78.2	72.1	58.2	60.0	42.4	36.4	20.0	36.4	36.4	54.5	10.9	-	-	27.3	58.2	63.6	80.0	5.5	14.5	1.8	92.2	-	1.8	-	72.7	20.0	69.1	-	63.6	43.6	50.5	-	69.1	9.1	-	-	-	-	-	-	1.8		

TABLE 60

## CLINICAL DATA, MAWULAY - MAMANSO

## FEMALES

AGE	PARASITAEMIA					ONCHOCERCIASIS					DENTITION				EYES			HAIR	LIPS			TONGUE				BONES			NUTRITION		ULCERS		SCARS		HERNIAE		SKIN								
	Persons	Blood Film Taken	Plasmodium Falciparum Present	Gametocytes Present	Acanthocheilomema Perstans	Mean Haemoglobin Percent	Skin snip taken	Skin positive	Nodules Positive	Ochocerciasis Positive	Onchodermatitis Present	Caries	Missing	D.M.F.	Gingivitis	Opacities in eyes	Abnormal	Blind	Hypochromotrichia	Normal	Cheilosis	Angular Stomatitis	Normal	Classitis	Fissured	Geographical	Normal	Bossed Skull	Beaded Ribs	Raw legs	Nutritional Deficiency Present	V.D. present or past	Complains of Illness	Ulcers Present	Vaccination Present	Other scars	Umbilical	Other	Lichenified	Dehiscant	Loss Elasticity	Xerosis			
Under 1	2	2	2	1	-	52.5	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	2	-	-	-	2	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-		
1 - 4	14	14	14	4	-	52.9	4	1	1	1	5	-	5	2	-	-	-	10	3	8	11	13	1	-	-	13	1	-	-	14	-	11	-	6	5	13	-	-	7	-	-	-	1		
5 - 9	12	12	12	1	-	49.6	12	4	4	6	7	2	7	2	-	-	-	7	1	11	10	12	-	-	-	12	-	-	-	12	-	6	2	10	5	11	-	-	9	-	-	-	-		
10 - 14	1	1	1	-	-	55.0	1	-	-	-	-	-	-	-	1	-	-	1	-	1	1	1	-	-	-	1	-	-	-	1	-	1	1	1	1	1	-	-	-	-	-	-	-		
15 - 19	2	2	2	-	-	52.5	2	2	2	2	1	-	-	-	2	-	-	-	-	1	2	1	1	1	-	2	-	-	-	2	-	-	1	1	2	-	-	2	-	-	-	-	-		
20 - 24	2	2	2	-	-	52.5	2	2	2	2	1	-	1	1	2	-	-	-	-	1	2	1	1	-	-	2	-	-	-	2	-	1	1	2	-	-	2	-	-	-	-	-	-		
25 - 29	9	9	9	1	-	56.1	9	8	9	9	7	3	7	4	8	-	1	-	-	9	7	6	1	2	-	9	-	-	-	9	-	8	-	7	6	4	-	-	8	1	-	-	-	-	
30 - 34	7	7	7	-	-	55.0	7	6	7	7	4	2	4	3	7	-	-	-	-	5	7	3	1	3	-	7	-	-	-	7	-	6	-	4	3	3	-	-	6	-	-	-	-	-	
35 - 39	3	3	3	-	-	51.7	3	3	3	2	3	3	3	1	1	-	-	-	-	3	3	1	1	1	-	3	-	-	-	3	-	2	-	2	1	2	-	-	3	-	-	-	-	-	
40 - 44	7	7	7	-	-	55.0	7	4	7	7	5	6	6	4	7	4	-	-	-	5	6	6	-	1	-	7	-	-	-	7	-	7	-	7	4	1	-	-	6	2	-	-	-	-	
45 - 49	2	2	2	-	-	55.0	2	2	2	2	2	1	2	2	2	1	-	-	-	2	2	2	1	-	1	-	2	-	-	-	2	-	2	-	2	1	1	-	-	2	-	1	-	-	
50 - 54	2	2	2	-	-	55.0	2	2	2	2	2	2	2	2	2	2	-	-	-	1	1	1	2	-	-	2	-	-	-	2	-	2	-	2	2	-	-	-	2	-	-	-	-	-	
55 - 59	2	2	1	-	-	57.5	2	2	2	2	2	2	2	1	2	2	-	-	-	1	2	1	-	1	-	2	-	-	-	2	-	2	-	2	2	1	-	-	2	2	-	-	-	-	
60 - 64	5	5	4	-	-	53.0	5	5	5	5	5	5	5	5	5	3	1	-	-	5	5	4	-	1	-	5	-	-	-	5	-	4	1	1	3	1	-	-	5	2	-	-	-	-	
65 - 69	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
70 - 74	2	2	1	-	-	55.0	2	2	2	2	2	2	2	2	1	1	-	-	-	2	2	1	-	1	-	2	-	-	-	2	-	2	-	1	1	1	-	-	2	-	2	-	-	-	
75 +	2	2	2	-	-	52.5	1	1	2	2	2	2	2	1	2	-	2	-	-	1	2	1	-	1	-	2	-	-	-	2	-	2	-	2	1	-	-	2	-	-	-	-	-	-	
Total	74	74	71	7	-	53.4	61	44	50	52	17	47	30	48	30	42	13	4	18	7	56	63	56	6	13	-	73	1	-	72	-	57	4	49	37	44	-	-	58	7	3	1	-	-	
Percent	-	100.0	95.9	9.9	-	7.4 gm/100ml	82.4	72.1	67.6	70.3	32.7	63.5	40.5	64.9	40.5	56.8	17.6	5.4	24.3	9.5	75.7	65.1	75.7	8.1	17.6	-	98.6	1.4	-	97.3	-	77.0	5.4	66.2	50.0	59.5	-	-	78.4	9.5	4.1	1.4	-	-	

CLINICAL DATA, MAWULAY - MAMANSO

TOTAL

AGE	PERSONS			PARASITAEMIA					ONCHOCERCIASIS					DENTITION			EYES		HAIR	LIPS			TONGUE			BONES			NUTRITION			ILLNESS			SCARS		HERNIAE		SKIN						
	M.	F.	T.	Blood Film Taken	Plasmodium Falciparum Present	Gametoocytes Present	Acanthocheilomonas Perstans	Mean Haemoglobin Percent	Skin snip taken	Skin positive	Nodules Positive	Ochocerciasis Positive	Onchodermatitis Present	Ungues	Missing	D.M.F.	Gingivitis	Opacities in Eyes	Abnormal	Blind	Hypochromotrichia	Normal	Cheilosis	Angular Stomatitis	Normal	Glossitis	Fissured	Geographical	Normal	Bossed skull	Beaded ribs	Bow legs	Nutritional Deficiency Present	V.D. Past or Present	Complains of Illness	Ulcers Present	Vaccination Present	Other	Umbilical	Other	Lichenified	Depigmented	Less Elasticity	Xerosis	
Under 1	5	2	7	7	6	4	-	50.0	-	-	-	-	-	-	-	-	-	-	-	-	7	-	-	7	-	-	-	7	-	-	-	-	-	6	-	-	-	5	-	-	-	-	-		
1 - 4	7	14	21	21	21	10	-	52.4	4	1	1	1	9	-	9	5	-	-	-	10	5	12	16	20	1	-	-	19	1	1	-	20	-	17	-	7	5	18	-	7	-	-	2		
5 - 9	10	12	22	22	22	2	-	49.5	22	5	6	8	-	7	2	7	2	-	-	7	2	20	19	22	-	-	-	22	-	-	-	21	-	10	2	17	8	19	-	17	-	-	-		
10 - 14	6	1	7	7	7	-	-	52.9	7	5	5	6	-	1	-	1	2	4	-	1	-	7	5	6	1	1	-	7	-	-	-	7	-	3	1	6	5	6	-	6	-	-	-		
15 - 19	3	2	5	5	5	-	-	54.0	5	4	4	4	1	1	-	1	1	5	-	-	-	3	3	4	1	1	-	5	-	-	-	5	-	3	-	4	3	4	-	5	-	-	-		
20 - 24	2	2	4	4	4	-	-	53.8	4	4	4	4	2	2	-	2	2	4	-	-	-	1	2	3	2	1	1	-	4	-	-	3	-	3	-	2	3	2	-	2	-	-	-		
25 - 29	4	9	13	13	13	1	-	55.8	13	12	13	13	3	8	3	8	5	12	1	1	-	1	12	9	8	1	4	-	13	-	-	12	3	11	-	10	9	4	-	12	8	-	-	-	
30 - 34	3	7	10	10	10	1	1	53.5	10	9	10	10	2	6	4	6	5	10	-	-	-	1	6	9	5	1	4	-	10	-	-	8	-	8	-	7	6	3	-	9	2	-	-	-	
35 - 39	5	3	8	8	7	-	-	54.4	8	8	8	8	3	7	7	7	4	6	-	-	-	2	6	6	5	1	2	-	6	-	-	6	3	6	-	6	4	2	-	7	2	-	-	-	
40 - 44	3	7	10	10	10	-	1	56.0	10	6	9	9	4	6	7	7	5	10	5	-	-	1	5	4	7	1	2	-	10	-	-	9	3	8	-	10	4	2	-	9	2	-	-	-	
45 - 49	2	2	4	4	4	1	-	52.5	4	4	4	4	2	2	1	2	3	4	2	-	-	-	3	4	2	-	2	-	4	-	-	4	-	4	-	4	1	2	-	4	1	-	-	-	
50 - 54	2	2	4	4	4	-	-	57.5	4	4	4	4	2	4	4	4	4	4	4	-	-	2	2	2	2	2	3	1	4	-	-	3	2	4	-	3	3	1	-	4	-	-	-		
55 - 59	1	2	3	3	2	-	-	58.3	3	3	3	3	3	3	2	3	2	3	3	-	-	-	1	3	2	3	1	3	-	3	1	3	-	3	-	3	3	1	-	3	2	-	-	-	
60 - 64	1	5	6	6	5	-	-	52.5	6	6	6	6	5	6	6	6	6	6	3	1	-	-	5	3	5	3	1	6	-	6	-	4	-	4	-	1	2	4	1	-	6	3	-	-	-
65 - 69	1	-	1	1	1	-	-	55.0	1	1	1	1	1	1	1	1	1	1	-	-	-	1	2	1	3	3	1	1	-	1	1	1	-	1	-	1	-	1	-	1	1	-	-	-	
70 - 74	-	2	2	2	1	-	-	55.0	2	2	2	2	1	2	2	2	2	2	1	-	-	-	2	2	1	3	1	2	-	2	-	2	-	2	-	1	1	1	-	2	1	-	-	-	
75 +	-	2	2	2	2	-	-	52.5	1	1	2	2	2	2	2	2	1	2	-	2	-	-	1	2	1	-	2	-	2	-	2	-	2	-	2	1	-	-	2	-	-	-	-		
Total	55	74	129	129	124	19	2	53.1	104	75	82	85	31	67	41	68	50	72	19	4	18	22	88	98	100	9	21	1	127	1	1	-	112	11*	95	4	64	61	72	-	96	12	3	2	
Percent				100.0	96.1	15.3	1.6	7.3 gm / 100ml	80.6	72.1	63.6	65.9	36.5	51.9	31.8	52.7	38.3	55.8	14.7	3.1	14.0	17.1	68.2	76.0	77.5	7.0	16.3	0.8	99.4	0.8	0.8	-	86.8	20.0	79.6	3.1	65.1	47.3	55.8	-	74.4	9.3	2.3	1.6	

\* Males only

The great trochanters and the iliac crests are the commonest sites for onchocercomata.

9.9% of persons had one nodule only, and 40.7% of persons had 10 or more nodules. 8 persons had 20 or more nodules.

From these findings it will be seen that onchocerciasis is more prevalent in the population and more intense in the individual in the population. One case of elephantiasis of scrotum and two cases of hydrocele were seen.

#### Dentition

The D.M.F. rates are 36.4% for males and 64.9% for females. 36.4% of the males and 40.5% of the females had gingivitis.

#### Eyes

No males were blind but 4 females (5.4%) were blind. All these females were blind in both eyes. Blindness was almost certainly due to onchocerciasis, as all four persons were positive for the disease and had onchodermatitis.

The rate for abnormal vision is high with 10.9% of males and 17.6% of females complaining of seeing "dark objects" in front of the eyes. This is frequently complained of by onchocerciasis cases at the onset of eye involvement.



MALARIA

Table 62

MAWULAY-MAMANSO

SPLENOMEGALY.

Both sexes N = 129

Class of Spleen	AGE GROUP				
	0 - 1	2 - 4	5 - 9	10-14	Adults
0	1	-	-	-	21
1	3	1	-	1	26
2	2	3	11	6	22
3	1	7	10	-	2
4	2	8	1	-	-
5	-	-	-	-	1

Spleen Rate 2 - 9 years = 100% Adult = 70%

Males N = 55

Class of Spleen	AGE GROUP				
	0 - 1	2 - 4	5 - 9	10-14	Adults
0	1	-	-	-	12
1	1	1	-	1	13
2	2	1	6	5	2
3	-	3	4	-	-
4	2	1	-	-	-
5	-	-	-	-	-

Spleen Rate 2 - 9 years = 100% Adult = 59%

Females N = 74

Class of Spleen	AGE GROUP				
	0 - 1	2 - 4	5 - 9	10-14	Adults
0	-	-	-	-	9
1	2	-	-	-	13
2	-	2	5	1	20
3	1	4	6	-	2
4	-	7	1	-	-
5	-	-	-	-	1

Spleen Rate 2 - 9 years = 100% Adult = 80%

MAWULAY-MAMANSO

Table 63

Frequency of Site of Onchocercomata

Site of Onchocercomata	Males	Females	Total	%
Sacrum	21	27	48	25.4
Great Tronchanters	28	46	74	39.2
Iliac crests	22	38	60	31.7
Thorax (ribs)	1	1	2	1.1
Head	-	-	-	-
Legs	2	2	4	2.1
Groin	1	-	1	0.5
	75	114	189	

Table 64

Number of Onchocercomata per Person

Number of Onchocercomata	Males	Females	Total	%
1	3	5	8	9.9
2	2	7	9	11.1
3	3	3	6	7.4
4	4	3	7	8.6
5	-	1	1	1.2
6	1	4	5	6.2
7	2	1	3	3.7
8	5	2	7	8.6
9	1	1	2	2.5
10 plus	10	23	33	40.7
	31	50	81	

Uniform opacities were seen in 54.5% of males and 56.8% of females.

#### Hypochromotrichia

This condition was not seen among the males but was noted in 18 (24.3%) of the females.

#### Nutritional Deficiency

72.7% of the males and 97.3% of the females showed signs of nutritional deficiency present or past.

#### Ulcers

There were none among the males but 5.4% of the females suffered from ulcers.

#### Vaccination

65.1% of both sexes had been vaccinated.

#### Venereal Disease

20.0% of all males had suffered from or were suffering from a urethral discharge, presumably gonorrhoea, making a rate of 44.8% for males of 15 years and over. There were no active cases at the time of examination.

#### Other Conditions

The following conditions were noted in Mawulay-Mamanso, in addition to those already assessed.

	Males	Females	Total
1. Congenital Heart	2	-	2
2. Deaf	-	1 (aged 48)	1
3. Dental Abcess	-	1	1
4. Diarrhoea	1	2	3
5. Elephantiasis Scrotum	1	-	1
6. Epidermophytosis	1	-	1
7. Epilepsy	1 (aged 15)	-	1
8. Hydrocele	2	-	2
9. Injury	1	1	2
10. Measles	4	5	9
11. Measles - broncho-pneumonia	1	3	4
12. Measles - Otitis media	2	-	2
13. Pneumonia	-	1	1
14. Scabies	5	5	10
15. Sepsis	3	2	5
16. Speech defect	-	1 (aged 48)	1
17. Tuberculosis	-	1	1
18. Worms	11	11	22
	35	34	69

Patients outside Sample seen at Mawulay-Mamanso

Age in Years	M	F	T
Under 1	2	1	3
1 - 4	4	6	10
5 - 9	1	2	3
10 - 14	-	-	-
15 - 19	1	-	1
20 - 24	2	1	3
25 - 29	1	2	3
30 - 34	3	-	3
35 - 39	-	2	2
40 - 44	-	2	2
45 - 49	2	-	2
50 - 54	1	-	1
55 - 59	-	1	1
60 - 64	1	5	6
65 - 69	4	-	-
70 - 74	-	-	-
75 plus	-	-	-
	18	22	40

Clinical Conditions Noted

1. Constipation	1
2. Malaria	14
3. Measles, Broncho-pneumonia	6
4. Onchocerciasis	11
5. Onchocerciasis with blindness	1
6. Sepsis	2
7. Vomiting and Diarrhoea	1
8. Worms	2

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11.3.9. Physiological Data

Haemoglobin percent was the only physiological measurement made. The mean haemoglobin level for males was 7.3 gms/100 ml. and for females 7.4 gms./100 ml.

11.3.10. Fertility and Survival

Fertility and Survival and the ages at which children died are set out in Tables 65 and 66.

Fertility

There were 7 live births, 5 males and 2 females in the year under review in a population of 129 (55 males, 74 females).

The Crude Birth Rate is 54.2 per 1000 live births

Fertility Rate

There were 32 females in the age groups 15 - 49 in

TABLE 65

## FEMALES

## FERTILITY AND SURVIVAL, MAWULAY - MAMANSO.

Age	Persons	Live Births			Stillbirths			Live Births in last year			Stillbirths in last year			Live Births dying within year			Multiple Pregnancies	Abortions	Children Dying			Non-Fertile Married Females	One Pregnancy only
		M	F	T	M	F	T	M	F	T	M	F	T	M	F	T							
15 - 19	2	1	1	2	-	-	-	1	-	1	-	-	-	-	-	-	1	-	-	-	-	1	
20 - 24	2	-	2	2	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	
25 - 29	9	14	16	30	-	1	1	1	1	2	-	-	-	-	1	1	7	9	9	18	2	-	
30 - 34	7	10	17	27	1	1	2	2	-	2	-	-	-	-	-	-	-	5	9	14	-	1	
35 - 39	3	10	7	17	2	-	2	-	1	1	-	-	-	-	-	-	1	4	4	8	-	-	
40 - 44	7	21	18	39	2	-	2	-	-	-	-	-	-	-	-	-	7	15	11	26	1	1	
45 - 49	2	11	6	17	1	1	2	1	-	1	-	-	-	-	-	-	1	5	1	6	-	-	
50 - 54	2	2	3	5	-	-	-	-	-	-	-	-	-	-	-	-	1	2	3	5	1	-	
55 - 59	2	7	10	17	-	-	-	-	-	-	-	-	-	-	-	-	1	2	6	8	-	-	
60 - 64	5	17	10	27	1	-	1	-	-	-	-	-	-	-	-	-	6	8	3	11	-	-	
65 - 69	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
70 - 74	2	3	9	12	1	-	1	-	-	-	-	-	-	-	-	-	1	1	5	6	-	-	
75+	2	7	5	12	2	-	2	-	-	-	-	-	-	-	-	-	2	6	3	9	-	-	
TOTAL	45	103	104	207	10	3	13	5	2	7	-	-	-	4	1	1	29	57	54	111	4	4	

TABLE 66

## AGES AT WHICH CHILDREN DIED, MAWULAY-MAMANSO.

## FEMALES

Age Group of Mother	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 - 59	60 - 64	65 - 69	70 - 74	75+	Total	
N	2	2	9	7	3	7	2	2	2	5	-	2	2	45	
Age at Death	Number of Children Dying													Total	%
0 - 1m	-	-	4	2	-	-	-	-	2	4	-	-	-	12	10.8
2m - 12m	-	-	7	8	3	5	3	3	3	4	-	1	2	39	35.1
Years Under 1	-	-	11	10	3	5	3	3	5	8	-	1	2	51	45.9
1 - 4	-	-	4	4	5	8	2	2	1	1	-	1	2	30	27.0
5 - 9	-	-	3	-	-	10	1	-	1	-	-	1	1	17	15.3
10 - 14	-	-	-	-	-	3	-	-	-	1	-	2	-	6	5.4
15 - 19	-	-	-	-	-	-	-	-	1	-	-	-	1	2	1.8
20+	-	-	-	-	-	-	-	-	-	1	-	1	3	5	4.5
TOTAL	-	-	18	14	8	26	6	5	8	11	-	6	9	111	99.9



Mawulay-Mamanso. In the year under review there were 7 live births, a General Fertility Rate of 218.7 per 1000.

32 females aged 30 years and over gave birth to 173 live births. The mean number of children born alive to each female in these age groups is therefore 5.4.

Of the 32 females in the reproductive age groups, all were married, one being widowed.

Of these 32 females, 3 (9.3%) had never been pregnant.

#### Family Size

From the distribution of ever-married women by number of children born alive (Table 66a) it can be seen that for women of 30 and over, the commonest number of live born children was 7 (21.8%) followed by 2, 6 and 10 at 12.5%. For women of completed fertility the distribution of numbers of children born alive tends to be high.

The average number of children born alive to married females of completed fertility was 6.

#### Sterility

There were 4 non-fertile married females. All had been married over 7 years, one for 9 years, one for 10, one for 20 and one for thirty years. There were 3 sterile females in the reproductive age groups, a rate of 9.3%

4 females (8.8%) had had one pregnancy only in the age groups 15 years and over. The youngest married female was aged 12 years.

#### Multiple Pregnancy Rate.

There were 4 sets of live twins. 2 sets of twins were stillborn.

Out of 207 live births there were 4 multiple pregnancies, a Multiple Pregnancy Rate of 19 per 1000 live births.

#### Sex Ratio at Birth

Using all live births, the Sex Ratio is 99 per 100 females.

#### Survival

From Table 66, the proportional rates for the children who died may be calculated. 10.8% of the children died were under 1 month and 45.9% were under 1 year. Infant deaths - Toddler deaths ratio is 1.7.

#### Infant Mortality Rate.

Only one child out of the 7 live births in the last year died during that year, an Infant Mortality Rate of 142.8 per 1000.

Basing the calculation on all the females in the village, using the total number of live births, 207, and the number who died under 1 year of age, 51, the mortality rate of these infants is 246.3 per 1000.

#### Stillbirth Rate.

There were no stillbirths during the last year. 13 stillbirths were recorded out of 220 live and stillbirths, a proportion of 59 per 1000 births, live and still.

Table 66a

MAMULAY-MAMANSO

Distribution of Ever-married women by Number of Children born alive

Present Age of Women	Number of women with the following number of children alive												Total number of women	
	0	1	2	3	4	5	6	7	8	9	10	11		12
15 - 29	2	5	1	-	2	1	-	2	-	-	-	-	-	13
30 - 44	1	2	2	2	1	1	2	4	-	1	1	-	-	17
45 and over	1	1	2	-	-	1	2	3	1	1	1	3	-	15
TOTAL	4	8	5	2	3	3	4	9	1	2	4	-	-	45

### Abortions

45 females who were married or had been married had 29 abortions, a rate of 10.6 per female. There were 116.4 abortions per 1000 pregnancies.

### Commentary

Mawulay-Mamanso is a small village at the river crossing. It is too small to have any amenities of its own, these can be got at either Masimera or Lunsar.

#### 11.4 Foradugu.

Foradugu is the seat of the Buya Romende Chiefdom. The Paramount Chief is Bai Fonte Gbangba II. He is an impressive looking man about 6 feet 3 inches tall.

The village appears to be growing rapidly. It lies on the main Lunsar-Makeni road about 8 miles from Lunsar and about 32 from Makeni.

It lies on the fork of the junction with the Old Makeni Road and the village extends along the roads.

It is about 8 miles north of the Rokel River as the crow flies.

A considerable amount of heavy traffic passes through the village as this is situated on one of the main roads of Sierra Leone. Lorries, transports, petrol tankers and other heavy vehicles are almost constantly passing through, or staging in the village.

There are two streams running near the village. To the south is the Keroch stream which is a tributary of the Bankasoka River and to the east is the Kaiuko stream running into the Magbos stream which later joins the Bankasoka.

Foradugu was chosen because:-

1. Persons had left the village to take up residence in Lunsar.
2. Persons from the village do not commute with Delco.
3. It is a rapidly growing village seat of Chiefdom inhabited by Africans only. It has been founded over a hundred years, and depends largely on agriculture with some trading.
4. The village is on a main road and will therefore have easy access to the larger towns, to Lunsar, Makeni, Freetown or Port Loko, for trade, medical care, and other facilities.
5. Paramount Chief Bai Forte requested that I survey the village.

Officials are:

Paramount Chief Bai Fonte Gbangba II

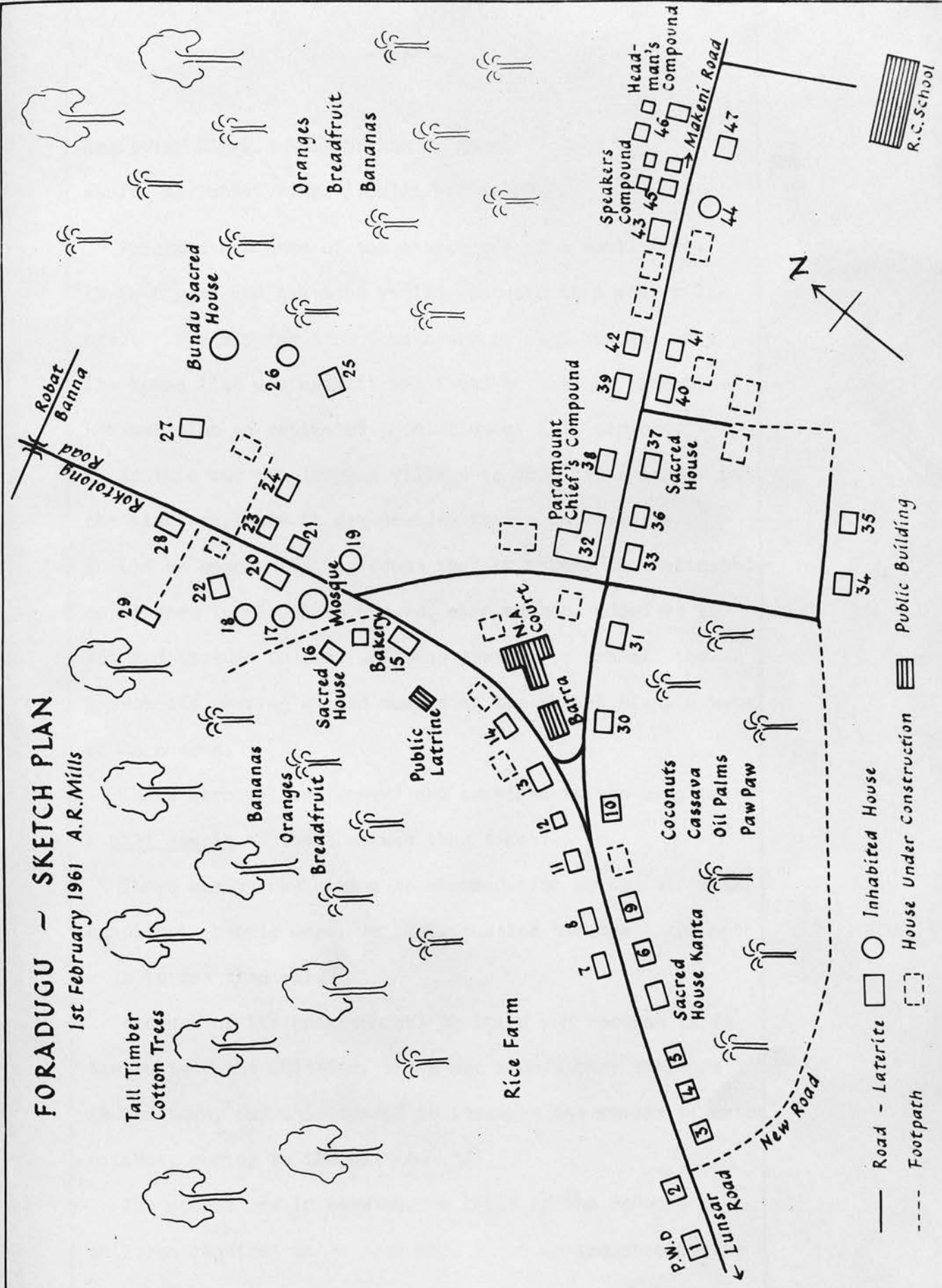
Sub-Chief Pa Alimamy Sesay

Speaker Pa Kapr Lawyerr

Native Administration. Chief Clerk Mr. M.E. Garber

# FORADUGU - SKETCH PLAN

1st February 1961 A.R. Mills



Tall Timber  
Cotton Trees

Bananas  
Oranges  
Breadfruit

Oranges  
Breadfruit  
Bananas

Bundu Sacred House

Sacred House  
Bakery  
Public Latrine

Rice Farm

Paramount Chief's Compound

Speakers Compound

Headman's Compound

Sacred House Kanta

Coconuts  
Cassava  
Oil Palms  
Paw Paw

- Road - Laterite
- Footpath
- Inhabited House
- House Under Construction
- ▨ Public Building

700 yards across approx.

Assistant Clerk. Mr. Ibrahim B. Dawo.

Health Assistant. Mr. Abdulai Karim Sesay.

Foradugu has some of the attributes of a small town. It is bigger and has more varied contacts than most villages. The mapping took four hours to complete and when the house list was made it was found to have 47 'inhabited houses' with an estimated population of 531 persons.

As this was too large a village to do a total sample in the time available it was decided that a half sample should be seen. It was found that by taking the estimated population in alternate houses, even numbers added up to 255 and the odds to 276. It was decided to see all the households bearing an odd number of the sketch plan, a total of 24 houses.

These were called forward and examined in the usual way. A half sample of the town was thus taken.

There was no resistance to enumeration or the clinical sampling; people were, in fact, puzzled because I did not wish to see them all.

Because of its geographical position and because it is the seat of the Chiefdom, there are always many visitors in the town, and this tended to increase the number of extra patients coming to the clinic.

The school was in session, so lists of the school-children required to be seen were given to the schoolmaster

and he kindly co-operated in sending the children for clinical examination. The children were thus examined in the company of their own household.

There were 18 girls between 5 and 14 years away in the Bundu bush.

#### 11.4.1. Housing

There are 47 houses in Foradugu, all of which were inhabited. 26 (55.3%) were made of thatch, mud and sticks. 4 (8.5%) only were of the traditional round design. All round houses were thatched. 43 houses were rectangular in shape. 21 houses had pan roofs (44.7%).

2 houses were rented, the rest were owned by the occupiers.

There were 273 rooms in these houses a mean of 5.8 rooms per house inhabited by 556 persons a density of 11.8 persons per house, 2 persons per room and 7.2 persons per separate family unit. There were 77 separate family units present in the village, 1.6 family units per house.

#### Overcrowding

4.3% of the population is under 1 year and 39.2% is between 1 and 10 years. The factor is thus 24% approximately.

8 houses out of 23 i.e., 34.5% were overcrowded.

#### Latrines

There were 39 latrines; thus 83% of houses had latrines, a rate of 1 per 14 persons.



Foradugu is unusual in that it also has a Public Latrine with one section of males and one for females.

This is situated at a central point (see Sketch plan) and is well constructed of mud and sticks with a corrugated iron roof, and a concrete floor. The sanitary labourers will keep the latrine clean and maintain it.

15 houses had food gardens.

#### 11.4.2. Water supplies

Water is taken from the stream Robat Banna.

#### 11.4.3. Rubbish Disposal

By individual households by burying, burning or putting on gardens.

#### 11.4.4. Burial of the Dead

There is a burial ground outside the town supervised by the Health Assistant.

#### 11.4.5. Medical and Sanitary Services

There is no dispensary in the town, in spite of its size.

Patients go to the Roman Catholic Mission Hospital at Mabesene, near Lunsar, about 5 miles away.

They may also use the Rosint Dispensary also about 5 miles away.

The Government Hospitals at Makeni - 40 miles and Port Loko - 32 miles are of easy access with transport which is always passing through the town.

The midwife from Rowula also comes to the town to undertake midwifery.

The Health Assistant had the following duties :-

1. Supervises cleaning of houses.
2. Town planning - also in other villages.
3. Rubbish disposal.
4. Advises on latrines.
5. Supervises burial ground outside Foradugu.

Handicapped

There are 6 blind persons in the town. No beggars or mentally deranged.

11.4.6. Shops and Bars

There are 8 shops and 2 bars, and 5 combined shops with bar in Foradugu. The articles for sale are as follows:-

Cloth, Palm oil, Beer, Wine, Onions, Canned food, Snuff - ground tobacco which is put into the cheek as a wad.

11.4.7. School

There is a Roman Catholic Mission School in Foradugu. The Roman Catholic Mission paid for the materials and communal labour was used in its construction. It is constructed of pan roof with concrete walls and floor. The teachers' salaries in such schools are met from Government funds.

Mr. A.K. Bangura is the teacher. There were 72 pupils in the school. There were 79 on the register, but the absentees had measles. They range from 4 - 12 years. There is no latrine at the school which had only recently been built.

#### 11.4.8. Census data, Foradugu

This is set out in Tables 67, 68 and 69. All figures given refer to the half sample.

#### Population Structure

Females are relatively more numerous in Foradugu than in any of the other populations studied. 167 (60.1%) out of the population of 278 are females.

50.0% of the population is under 15 years old and 27.7% is under 5 years old.

In the age groups 20-39 there are only 16 males compared with 49 females.

At the time of the survey there were 18 Bundu girls, aged 5-14 away from the village being initiated. Therefore 9 girls, aged 5-14 should be added to the half sample to give a correct picture of female predominance. These girls are not included in the Census figures. One other Bundu girl was in the census and was seen because of illness - Measles Bronchopneumonia. The population under 20 is greater than that between 20 and 40 (151:65)

TABLE 67

## MALES

## HALF SAMPLE CENSUS DATA, FORADUGU.

Age	Persons	Civil State					Tribe						Occupation							Religion				Literacy		
		Single	Married	Widowed	Divorced	Separated	Temne	Mende	Fulah	Limba	Creole	Other	Born in Village	House	Farmer	Trader	Industry	School	Koranic School	Child or None	Muslim	R.C.	Protestant	Pagan	Literate	Arabic
Under 1	7	7	-	-	-	-	6	1	-	-	-	-	7	-	-	-	-	-	-	7	6	-	1	-	-	-
1 - 4	30	30	-	-	-	-	30	-	-	-	-	-	21	-	-	-	-	4	-	29	30	-	-	-	-	-
5 - 9	27	27	-	-	-	-	25	1	1	-	-	20	3	9	-	-	18	1	8	27	-	-	-	-	-	-
10 - 14	10	10	-	-	-	-	10	-	-	-	-	7	3	6	1	-	3	6	-	10	-	-	-	-	-	-
15 - 19	4	4	-	-	-	-	3	-	-	-	1	2	1	1	2	-	2	1	-	4	-	-	-	-	-	-
20 - 24	3	2	1	-	-	-	1	1	1	-	-	1	1	1	1	1	1	2	-	2	-	1	-	1	-	-
25 - 29	4	1	3	-	-	-	3	-	1	-	-	2	-	3	-	1	-	2	-	4	-	-	-	-	-	-
30 - 34	5	1	4	-	-	-	5	-	-	-	-	5	-	5	-	-	-	1	-	5	-	-	-	-	-	-
35 - 39	4	1	3	-	-	-	4	-	-	-	-	3	-	3	-	1	1	2	-	3	-	1	-	1	-	-
40 - 44	3	-	3	-	-	-	3	-	-	-	-	3	-	2	-	1	-	2	-	3	-	-	-	-	-	-
45 - 49	3	-	3	-	-	-	3	-	-	-	-	2	-	3	-	-	-	1	-	3	-	-	-	-	1	-
50 - 54	4	-	3	1	-	-	4	-	-	-	-	4	-	4	-	-	-	-	-	4	-	-	-	-	-	-
55 - 59	4	-	4	-	-	-	4	-	-	-	-	4	-	4	1	-	-	-	-	2	-	-	2	-	-	-
60 - 64	1	-	1	-	-	-	2	-	-	-	-	1	-	1	4	-	-	1	-	1	-	-	-	-	-	-
65 - 69	2	-	1	1	-	-	2	-	-	-	-	2	-	2	-	-	-	-	-	2	-	-	-	-	-	-
70 - 74	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
75+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	111	83	26	2	-	-	104	3	2	1	-	1	84	8	44	6	4	26	19	44	106	-	3	2	2	1
Percent		74.8	23.4	1.8	-	-	93.7	2.7	1.8	0.9	-	0.9	75.7	7.2	39.6	5.4	3.6	23.4	17.1	39.6	95.5		2.7	1.8	1.8	0.9

TABLE 68

## HALF SAMPLE CENSUS DATA, FORADUGU.

## FEMALES

Age	Persons	Civil State					Tribe					Occupation							Religion				Literacy			
		Single	Married	Widowed	Divorced	Separated	Temne	Mende	Fulah	Limba	Creole	Other	Born in Village	House	Farmer	Trader	Industry	School	Koranic School	Child or None	Muslim	R.C.	Protestant	Pagan	Literate	Arabic
Under 1	5	5	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	5	5	-	-	-	-	-	-
1 - 4	35	35	-	-	-	-	34	-	-	-	-	1	33	1	-	-	4	-	31	35	-	-	-	-	-	-
5 - 9	17	17	-	-	-	-	16	-	-	-	-	1	10	9	4	1	4	1	10	17	-	-	-	-	-	-
10 - 14	8	8	-	-	-	-	8	-	-	-	-	-	5	4	6	-	1	-	-	8	-	-	-	-	-	-
15 - 19	8	1	7	-	-	-	8	-	-	-	-	-	4	8	4	3	-	-	-	8	-	-	-	-	-	-
20 - 24	14	-	14	-	-	-	14	-	-	-	-	-	3	14	8	5	-	1	-	13	-	1	-	1	-	-
25 - 29	14	-	13	-	1	-	13	-	1	-	-	-	4	14	9	7	1	-	1	13	-	-	1	-	-	-
30 - 34	12	-	12	-	-	-	10	-	2	-	-	-	5	10	9	6	-	-	1	12	-	-	-	-	-	-
35 - 39	9	-	8	-	1	-	9	-	-	-	-	-	5	8	7	4	2	-	-	8	-	-	1	-	-	-
40 - 44	8	-	5	3	-	-	6	-	-	1	-	1	3	6	8	3	-	-	1	8	-	-	-	-	-	-
45 - 49	11	-	10	1	-	-	10	-	-	-	-	1	5	11	10	3	1	-	-	11	-	-	-	-	-	-
50 - 54	5	-	4	-	-	1	5	-	-	-	-	-	4	5	2	3	3	-	1	5	-	-	-	-	-	-
55 - 59	7	-	4	3	-	-	6	-	-	-	-	1	5	7	5	1	1	-	1	7	-	-	-	-	-	-
60 - 64	10	-	7	1	-	2	8	-	-	-	-	2	9	9	9	6	1	-	-	10	-	-	-	-	-	-
65 - 69	2	-	2	-	-	-	2	-	-	-	-	-	1	2	2	-	-	-	-	2	-	-	-	-	-	-
70 - 74	1	-	-	1	-	-	1	-	-	-	-	-	1	1	-	-	-	-	-	1	-	-	-	-	-	-
75+	1	-	-	1	-	-	1	-	-	-	-	-	1	1	1	-	-	-	-	1	-	-	-	-	-	-
TOTAL	167	66	86	10	2	3	156	-	3	1	-	7	103	110	84	42	9	10	6	46	164	-	1	2	1	-
		39.5	51.5	6.0	1.2	1.8	93.4	-	1.8	0.6	-	4.2	61.7	65.9	50.3	25.1	15.4	6.0	3.6	27.5	98.2	-	0.6	1.2	0.6	-

TABLE 69.

TOTAL HALF SAMPLE CENSUS DATA, FORADUGU

Age	Persons			Group as % Total	Civil State					Tribe						Occupation						Religion				Literacy		
	M	F	T		Single	Married	Widowed	Divorced	Separated	Temne	Mende	Fulah	Limba	Creole	Other	Born in Village	House	Farmer	Trader	Industry	School	Koranic School	Child or None	Muslim	R.C.	Protestant	Pagan	Literate
Under 1	7	5	12	4.3	12	-	-	-	-	11	1	-	-	-	12	-	-	-	-	-	-	12	11	-	1	-	-	-
1 - 4	30	35	65	23.4	65	-	-	-	-	64	-	-	-	1	54	1	-	-	-	5	-	60	65	-	-	-	-	-
5 - 9	27	17	44	15.8	44	-	-	-	-	41	1	-	1	1	30	12	13	1	-	22	2	18	44	-	-	-	-	-
10 - 14	10	8	18	6.5	18	-	-	-	-	18	-	-	-	-	12	7	12	1	-	4	6	-	18	-	-	-	-	-
15 - 19	4	8	12	4.3	5	7	-	-	-	11	-	-	-	1	6	9	5	5	-	2	1	-	12	-	-	-	-	-
20 - 24	3	14	17	6.1	2	15	-	-	-	15	1	1	-	-	4	15	9	6	1	2	2	-	15	-	2	-	2	-
25 - 29	4	14	18	6.5	1	16	-	1	-	16	-	2	-	-	6	14	12	7	2	-	3	-	17	-	-	1	-	-
30 - 34	5	12	17	6.1	1	16	-	-	-	15	-	2	-	-	10	10	14	6	-	-	2	-	17	-	-	-	-	-
35 - 35	4	9	13	4.6	1	11	-	1	-	13	-	-	-	-	8	8	10	4	3	1	2	-	11	-	1	1	1	-
40 - 44	3	8	11	4.0	-	8	3	-	-	9	-	-	1	1	6	6	10	3	1	-	3	-	11	-	-	-	-	-
45 - 49	3	11	14	5.0	-	13	1	-	-	13	-	-	-	1	7	11	13	3	1	-	1	-	14	-	-	-	-	1
50 - 54	4	5	9	3.2	-	7	1	-	1	9	-	-	-	-	8	5	6	3	3	-	1	-	9	-	-	-	-	-
55 - 59	4	7	11	4.0	-	8	3	-	-	10	-	-	-	1	9	7	9	2	1	-	1	-	9	-	-	2	-	-
60 - 64	1	10	11	4.0	-	8	1	-	2	9	-	-	-	2	10	9	10	7	1	-	1	-	11	-	-	-	-	-
65 - 69	2	2	4	1.4	-	3	1	-	-	4	-	-	-	-	3	2	4	-	-	-	-	-	4	-	-	-	-	-
70 - 74	-	1	1	0.4	-	-	1	-	-	1	-	-	-	-	1	1	-	-	-	-	-	-	1	-	-	-	-	-
75+	-	1	1	0.4	-	-	1	-	-	1	-	-	-	-	1	1	1	-	-	-	-	-	1	-	-	-	-	-
TOTAL	111	167	278		149	112	12	2	3	260	3	5	2	8	187	118	128	48	13	36	25	90	270	-	4	4	3	1
Percent	39.9	60.1			53.6	40.3	4.3	0.7	1.1	93.5	1.1	1.8	0.7	2.9	67.3	42.4	46.0	17.3	4.7	12.9	9.0	32.4	97.1	-	1.4	1.4	1.1	0.4

hence, if emigration is left out, the population will tend to increase.

#### Civil State

23.4% of all males and 51.5% of all females were married.

11 (68.7%) out of 16 males between 20 and 35 years were married.

All females in these age groups had been married, two having been divorced. The youngest married female was aged 15 years. All persons in the 45 - 54 age group had been married.

#### Polygyny

Of 26 married males, 12 (46.1%) had one wife, 9 (34.6%) had 2 wives, 4 (15.3%) had 3 wives and 1 (3.8%) had four wives.

53.7% of marriages were polygynous. See Table 70.

#### Tribe

Temne form 93.5% of the population. There are one male and six female Mandingo in Foradugu, also one female Loko.

The Mende, Fulah and Limba are represented by 3, 5, and 2 persons respectively.

#### Birthplace

75.7% of the males and 61.7% of the females were born in Foradugu.

Table 70

POLYGYNY, FORADUGU

Number of wives per married male

Married Males		Number of Living wives				Total Wives
Age in years	N	1	2	3	4	
15 - 19	-	-	-	-	-	-
20 - 24	1	1	-	-	-	1
25 - 29	3	2	1	-	-	4
30 - 34	4	1	1	2	-	9
35 - 39	3	-	2	1	-	7
40 - 44	3	3	-	-	-	3
45 - 49	3	1	2	-	-	5
50 - 54	3	2	1	-	-	4
55 - 59	4	2	1	1	-	7
60 - 64	1	-	-	-	1	4
65 - 69	1	-	1	-	-	2
70 - 74	-	-	-	-	-	-
75 plus	-	-	-	-	-	-
TOTAL	26	12	9	4	1	46
PER CENT		46.1	34.6	15.3	3.8	



In view of the nodal situation and apparent rapid growth of Foradugu the duration of residence in the village was estimated. This is given in Table 71 and shows a similar pattern to that of Lunsar.

#### Religion

97.1% of both sexes and all ages were Muslim. There were 4 Protestants (1.4%) and 4 Pagans (1.4%) but no Roman Catholics in the town. The foundations of a new mosque were being laid at the time of the survey.

#### Education

26 males (23.4%) and 10 females (6.0%) were attending or had attended school. 19 (17.1%) males and 6 (3.6%) females were attending or had attended the Koranic School.

#### Literacy

There were 2 males (1.8%) and 1 female (1.1%) who were literate in English. One male was literate in Arabic.

#### Occupation

'House' 8 (7.7%) males and 110 (65.9%) females gave this as their occupation.

'Farmer' 44 (39.6%) males and 84 (50.3%) of females gave farming as their occupation.

'Trader' 6 (5.4%) males and 42 (25.1%) females were traders.

'Industry' As in all the villages, there is no industry comparable with that of Lunsar.

Table 71  
Residence in Toradugu

Age	Residence in years											
	Males				Females				Total			
	2	2-5	6-9	10+	2	2-5	6-9	10+	2	2-5	6-9	10+
Under 1	7	-	-	-	5	-	-	-	12	-	-	-
1 - 4	15	15	-	-	12	23	-	-	27	38	-	-
5 - 9	3	15	9	-	4	7	6	-	7	22	15	-
10 - 14	3	1	-	6	1	1	1	5	4	2	1	11
15 - 19	-	2	-	2	4	-	-	4	4	2	-	6
20 - 24	1	2	-	-	4	5	1	4	5	7	1	4
25 - 29	-	1	1	2	3	3	1	7	3	4	2	9
30 - 34	-	-	-	5	3	2	1	6	3	2	1	11
35 - 39	-	1	-	3	-	3	1	5	-	4	1	8
40 - 44	-	-	-	3	-	2	-	6	-	2	-	9
45 - 49	-	-	-	3	2	1	2	6	2	1	2	9
50 - 54	-	-	-	4	-	-	-	5	-	-	-	9
55 - 59	-	-	-	4	1	1	-	5	1	1	-	9
60 - 64	-	-	-	1	1	-	-	9	1	-	-	10
65 - 69	-	-	-	2	-	-	-	2	-	-	-	4
70 - 74	-	-	-	-	-	-	-	1	-	-	-	1
75 plus	-	-	-	-	-	-	-	1	-	-	-	1
TOTAL	29	37	10	35	40	48	13	66	69	85	23	101
PERCENT	26.1	33.3	9.0	31.5	24.0	28.7	7.8	39.5	24.8	30.6	8.3	36.3

4 (3.5%) males and 9 (5.4%) females were engaged in manufacture or were employed.

4 males gave their occupations as:-

Chief Clerk Native Administration	1
Court Messenger	1
Public Works Department, Overseer	1
Tailor	1

9 females gave their occupations as:-

Basket and Snuff makers	3
Dyer of Clothes	2
Fish net maker	1
Pillow and headdie maker	2
Potter	1
Preparing of food for sale	1

Some had more than one activity.

In addition to these occupations there was one Arabic teacher in the sample.

Outside the Sample was the Paramount Chief, the Speaker, the Digba and others.

#### 11.4.10. Clinical Data

The data extracted from the schedules are shown in Tables 72, 73, 74, 75, 76 and 77.

#### Morbidity

##### Malaria

Plasmodium falciparum was present in 97.3% of males and 97.6% of females examined.

TABLE 72

## CLINICAL DATA, FORADUGU

## MALES

	PARASITAEMIA					ONCHOCERCIASIS					DENTITION				EYES			HAIR	LIPS			TONGUE				BONES			NUTRITION			ILLNESS		SCARS		HERNIAE		SKIN				
	Persons	Blood film taken	Plasmodium Falciparum Present	Gametoocytes Present	Acanthocheilium Perstans	Mean Haemoglobin Percent	Skin snip taken	mf. o. volvolus present	Nodules Positive	Onchocerciasis Positive	Onchodermatitis Present	Caries	Missing	D.M.F.	Gingivitis	Opacities in eyes	Abnormal	Blind	Hyochromotrichia	Normal	Cheilosis	Angular Stomatitis	Normal	Glossitis	Fissured	Geographical	Normal	Fossed Skull	Beaded ribs	Bow legs	Nutritional Deficiency Present	V.D. Present or past	Complains of Illness	Ulcers Present	Vaccination	Other	Umbilical	Other	Lichenified	Depigmented	Loss Elasticity	Xerosis
Under 1	7	7	5	1	-	45.7	-	-	-	-	-	-	-	-	-	-	-	-	7	-	-	7	-	-	-	7	-	-	-	-	-	3	-	-	1	4	-	-	-	-	-	
1 - 4	30	30	30	11	-	46.7	5	-	-	-	4	-	4	4	-	-	-	1	8	19	21	27	2	-	1	30	-	-	-	23	-	21	1	9	12	29	-	3	-	-	-	
5 - 9	27	27	27	6	-	47.6	27	1	2	2	7	-	7	-	2	-	1	-	1	25	23	24	3	-	-	27	-	-	-	27	-	5	9	18	19	26	-	20	-	-	-	
10 - 14	10	10	10	1	-	50.0	10	1	2	-	4	-	4	3	2	-	-	-	-	10	8	9	1	1	-	10	-	-	-	10	-	5	-	10	5	9	-	9	-	-	-	
15 - 19	4	4	4	-	-	51.3	4	1	1	1	1	-	1	-	3	-	-	-	-	4	3	2	1	1	-	4	-	-	-	4	1	1	-	4	3	2	-	4	-	-	-	
20 - 24	3	3	3	-	-	51.7	3	1	1	1	1	1	1	1	2	-	-	-	1	2	-	3	-	-	-	3	-	-	-	2	1	2	1	2	2	-	-	3	1	-	-	
25 - 29	4	4	4	-	-	51.3	4	3	3	3	3	2	3	2	4	1	-	-	-	3	3	3	-	1	-	4	-	-	-	4	2	4	-	4	3	2	1	4	-	-	-	
30 - 34	5	5	5	1	-	53.0	5	4	4	5	4	2	4	3	4	1	1*	-	-	5	4	4	1	1	-	5	-	-	-	5	2	5	1	3	2	-	-	5	-	-	-	
35 - 39	4	4	3	1	-	53.8	4	3	3	3	3	2	3	2	4	1	-	-	2	2	2	3	1	1	-	4	-	-	-	2	2	3	-	4	2	1	-	3	1	-	-	
40 - 44	3	3	3	-	-	51.7	3	2	3	3	2	1	2	3	3	-	-	-	1	1	2	1	-	2	-	3	-	-	-	2	2	3	2	2	3	1	-	3	1	-	-	
45 - 49	3	3	3	-	-	50.0	3	3	3	3	2	2	2	3	3	3	-	-	1	-	2	3	-	-	-	3	-	-	-	2	2	3	1	3	3	-	-	3	-	-	-	
50 - 54	4	4	4	-	-	50.0	4	3	4	4	4	4	4	4	4	1	-	-	2	2	2	4	-	-	-	4	-	-	-	2	3	3	-	3	1	1	-	4	-	-	-	
55 - 59	4	4	4	-	-	51.3	4	3	4	4	4	4	4	3	4	2	-	-	1	3	2	1	-	3	-	4	-	-	-	3	-	3	1	3	3	-	-	4	-	-	-	
60 - 64	1	1	1	-	-	60.0	1	-	1	1	1	-	1	1	1	-	-	-	-	-	1	1	-	-	-	1	-	-	-	1	1	-	-	1	-	-	-	1	-	-	-	
65 - 69	2	2	2	-	-	47.5	2	1	1	1	2	1	2	2	2	1	-	-	-	2	1	1	2	-	-	2	-	-	-	1	1	2	-	1	1	-	-	2	-	-	-	
70 - 74	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
75 +	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total	111	111	108	21	-	48.8	79	26	32	31	8	42	19	42	31	38	10	2	1	24	78	74	94	9	10	1	111	-	-	-	81	17	63	16	67	60	75	1	68	2	-	-
Percent			97.3	19.4		6.73gm/100ml	71.2	32.9	28.3	27.9	25.3	37.3	17.1	37.8	27.8	34.2	9.0	1.8	0.9	21.6	70.3	66.7	84.7	8.1	9.0	0.9	100	-	-	-	79.3	15.3	56.3	14.4	60.4	54.1	67.6	0.9	61.3	1.8	-	-

\* Left eye only

TABLE 73

## CLINICAL DATA, FORADUGU

## FEMALES

AGE	PARASITAEMIA					ONCHOCERCIASIS				DENTITION				EYES		HAIR	LIPS			TONGUE				BONES				ILLNESS			ULCERS	SCARS	HERNIAE	SKIN														
	Persons	Blood film taken	Plasmodium Falciparum Present	Gametocytes Present	Acanthocheilium Perstans	Mean Haemoglobin Percent	Skin snip taken	mf. o. volvulus Present	Nodules Positive	Onchocerciasis Positive	Onchodermatitis Present	Caries	Missing	D.M.F.	Gingivitis	Opacities in Eyes	Abnormal	Blind	Hypochromotrichia	Normal	Cheilosis	Angular Stomatitis	Normal	Glossitis	Fissured	Geographical	Normal	Pegged Skull	Beaded ribs	Beck's legs	Nutritional Deficiency Present	V.D. Present or past	Complains of Illness	Ulcers Present	Vaccination	Other	Umbilical	Other	Lichenified	Depigmented	Loss Elasticity	Isoriasis						
Under 1	5	4	4	-	-	47.5	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1 - 4	35	35	35	8	-	48.0	4	-	-	-	5	1	5	11	-	-	-	19	5	26	29	29	6	-	-	-	35	-	-	-	-	-	32	-	24	2	9	12	28	-	1	-	-	-	-	-	-	
5 - 9	17	17	17	3	-	48.5	15	-	-	-	7	1	8	4	-	-	-	9	1	15	14	16	1	-	-	-	17	-	-	-	-	-	17	-	8	7	7	12	-	7	-	-	-	-	-	-		
10 - 14	8	8	8	3	-	51.3	8	-	2	2	2	-	2	1	3	-	-	4	-	8	6	7	1	-	-	-	8	-	-	-	-	-	8	-	6	7	5	-	5	-	-	-	-	-	-	-		
15 - 19	8	8	7	2	-	50.0	7	-	3	4	1	-	1	1	7	-	-	-	-	8	6	6	-	1	1	-	8	-	-	-	-	-	8	-	5	1	6	6	4	-	4	-	-	-	-	-	-	
20 - 24	14	14	14	1	1	50.7	14	6	11	11	6	3	6	4	14	1	-	-	1	14	11	10	1	9	-	-	14	-	-	-	-	-	13	-	9	1	11	10	7	-	10	-	-	-	-	-		
25 - 29	14	14	13	3	-	50.0	14	3	11	11	10	4	10	6	13	2	-	-	1	12	10	9	2	2	1	-	14	-	-	-	-	-	14	-	9	11	10	6	-	10	-	-	-	-	-	-		
30 - 34	12	12	11	-	-	50.4	12	8	11	11	8	7	8	7	12	2	-	-	1	11	9	8	1	4	-	-	12	-	-	-	-	-	11	-	11	10	3	-	10	-	-	-	-	-	-	-		
35 - 39	9	9	9	1	-	51.7	8	3	6	6	5	4	5	5	9	4	-	-	-	9	7	5	2	1	-	-	9	-	-	-	-	-	9	-	8	1	7	6	2	-	7	1	-	-	-	-	-	
40 - 44	8	8	8	2	-	49.4	8	5	8	8	5	5	5	6	8	4	-	-	-	5	7	8	-	-	-	-	8	-	-	-	-	-	7	-	5	7	1	-	7	-	-	-	-	-	-	-		
45 - 49	11	11	11	2	1	51.4	11	5	10	10	11	8	11	11	11	5	-	-	-	7	10	9	1	1	-	-	11	-	-	-	-	-	10	-	10	1	7	10	-	10	2	-	-	-	-	-	-	
50 - 54	5	5	5	-	-	49.0	5	1	5	5	5	4	5	4	5	4	-	-	-	2	5	2	2	1	-	-	5	-	-	-	-	-	5	-	2	1	5	3	-	5	-	-	-	-	-	-		
55 - 59	7	6	6	-	-	47.5	6	3	5	5	6	6	6	4	7	2	-	-	-	5	4	3	-	4	-	-	7	-	-	-	-	-	7	-	6	-	7	4	1	-	6	-	-	-	-	-	-	
60 - 64	10	10	9	-	-	49.5	9	6	8	9	10	9	10	9	10	6	1*	-	-	2	7	6	8	1	2	-	-	10	-	-	-	-	-	8	-	10	2	10	6	1	-	8	-	1	1	-	-	-
65 - 69	2	2	2	-	-	47.5	2	2	2	2	2	2	2	2	2	2	-	-	-	1	1	1	2	-	-	-	2	-	-	-	-	-	2	-	2	2	-	2	-	2	-	2	-	-	-	-	-	
70 - 74	1	1	1	-	-	50.0	1	1	1	1	1	1	1	1	1	1	-	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	1	-	1	1	1	1	-	1	-	1	-	-	-	-	-	-
75 +	1	1	1	-	-	50.0	1	-	1	1	-	1	1	-	1	-	-	-	-	1	1	1	-	-	-	-	1	-	-	-	-	-	1	-	1	-	1	-	1	-	1	-	-	-	-	-	-	-
Total	167	165	161	25	2	49.5	125	43	84	86	9	84	56	86	7	103	33	1	32	19	132	126	128	19	19	2	167	-	-	-	152	-	119	10	104	102	73	-	94	3	1	1	-	-	-	-		
Percent		97.6	15.5	1.2		6.93 gm / 100ml	74.9	34.4	50.3	51.5	10.5	50.3	33.5	51.5	45.4	61.7	19.8	0.6	19.2	11.4	79.0	75.4	76.6	11.4	11.4	1.2	100.0	-	-	-	91.0		71.3	6.0	62.3	61.1	43.7	-	56.3	1.6	0.6	0.6	-	-	-	-		

\* Right Eye Only

TABLE 74

CLINICAL DATA, FORADUGU

TOTAL

AGE	Persons			PARASIT AEMIA					ONCHOCERCIASIS					DENTITION			EYES		HAIR		LIPS			TONGUE			BONES			ILLNESS			SCARS			HERNIAE		SKIN						
				Blood Film Taken	Plasmodium Falciparum Present	Gametoocytes Present	Acanthocheilomema Peritans	Mean Haemoglobin Percent	Skin snip Taken	mf. o. Volvulus Present	Nodules Positive	Onchocerciasis Positive	Onchodermatitis Present	Caries	Missing	D.M.F.	Gingivitis	Opacities in Eyes	Abnormal	Blind	Hypochromotrichia	Normal	Chellosis	Angular Stomatitis	Normal	Glossitis	Fissured	Geographical	Normal	Fused Skull	Beaded Ribs	Less than normal	Nutritional Deficiency Present	V.D. Present or past	Complains of Illness	Ulcers Present	Vaccination	Other	Umbilical	Other	Idenified	Depigmented	Loss Elasticity	Xerosis
Under 1	7	5	12	11	9	1	-	46.4	-	-	-	-	-	-	-	-	-	-	12	-	-	12	-	-	-	12	-	-	-	-	5	-	-	1	6	-	-	-	-	-	-			
1 - 4	30	35	65	65	65	19	-	47.4	9	-	-	-	-	9	1	9	15	-	20	13	45	50	56	8	-	1	65	-	-	-	55	-	45	3	18	24	57	-	4	-	-	-		
5 - 9	27	17	44	44	44	9	-	50.0	42	1	2	2	-	14	1	15	4	2	1	9	2	40	37	40	4	-	44	-	-	44	-	13	9	26	26	38	-	27	-	-	-	-		
10 - 14	10	8	18	18	18	4	-	50.6	18	1	4	2	-	6	-	6	4	5	-	4	-	18	14	16	2	1	18	-	-	18	-	9	-	16	12	14	-	14	-	-	-	-		
15 - 19	4	8	12	12	11	2	-	50.4	11	1	4	5	-	2	-	2	1	10	-	-	-	12	9	8	1	2	1	12	-	-	12	1	6	1	10	9	6	-	8	-	-	-	-	
20 - 24	3	14	17	17	17	1	1	50.9	17	7	12	12	-	7	4	7	5	16	1	-	2	16	11	13	1	3	17	-	-	15	1	11	2	13	12	7	-	13	-	-	-	-		
25 - 29	4	14	18	18	17	3	-	50.3	18	6	14	14	-	13	6	13	8	17	3	1	-	1	15	13	12	2	3	1	18	2	14	-	13	14	8	1	14	-	-	-	-	-		
30 - 34	5	12	17	17	16	1	-	51.2	17	12	15	16	1	12	9	12	10	16	3	1	-	1	16	13	12	2	5	17	-	-	16	2	15	1	14	12	3	-	15	-	-	-	-	
35 - 39	4	9	13	13	12	2	-	52.3	12	6	9	9	2	8	6	8	7	13	5	-	2	11	9	8	3	2	13	-	-	11	2	11	1	11	7	3	-	10	1	-	-	-	-	
40 - 44	3	8	11	11	11	2	-	50.6	11	7	11	11	1	7	6	7	9	11	4	-	2	6	9	9	-	2	11	-	-	9	2	10	2	7	10	2	-	10	1	-	-	-	-	
45 - 49	3	11	14	14	14	2	1	51.1	14	8	13	13	4	13	10	13	14	14	8	-	2	7	12	12	1	1	14	-	-	12	2	13	2	10	13	-	-	13	2	-	-	-	-	
50 - 54	4	5	9	9	9	-	-	49.4	9	4	9	9	1	9	8	9	8	9	5	-	2	4	7	6	2	1	9	-	-	7	3	5	1	8	4	1	-	9	-	-	-	-		
55 - 59	4	7	11	10	10	-	-	44.5	10	6	9	9	4	10	10	10	7	11	4	-	1	8	6	4	-	7	11	-	-	10	-	9	1	10	7	1	-	10	-	-	-	-	-	
60 - 64	1	10	11	11	10	-	-	55.0	10	6	9	10	2	11	9	11	10	11	6	1	-	2	7	7	9	1	2	11	-	-	9	1	10	2	11	6	1	-	9	-	1	1		
65 - 69	2	2	4	4	4	-	-	47.5	4	3	3	3	2	4	3	4	4	4	3	-	1	3	2	4	-	-	4	-	-	2	1	4	-	3	3	-	-	4	1	-	-	-		
70 - 74	-	1	1	1	1	-	-	50.0	1	1	1	1	-	1	1	1	1	1	1	-	-	1	-	-	-	1	-	-	1	-	1	-	1	1	1	-	1	-	-	-	-	-		
75 +	-	1	1	1	1	-	-	50.0	1	-	1	1	-	-	1	1	-	1	-	-	-	1	1	-	-	1	-	-	1	-	1	-	1	-	1	-	-	1	-	-	-	-		
Total	111	167	278	276	269	46	2	49.2	204	69	116	117	17	126	75	120	107	141	43	3	33	43	210	200	222	28	29	3	278	-	-	-	240	17*	162	26	171	162	148	1	162	5	1	1
Percent	-	-	-	97.5	17.1	0.7		6.8gm/100ml	75.4	33.8	41.7	42.1	14.5	45.3	28.0	46.0	38.5	50.7	15.5	1.1	11.9	15.5	75.5	71.9	79.9	10.1	10.4	1.1	100.0	-	-	-	86.3	15.3	65.5	9.4	61.5	58.3	53.2	0.4	58.3	1.8	0.4	0.4

\* Males only

Spleen rates in the 2 - 9 age groups were 100% for both males and females but adult males had a rate of 54% compared with 90% for females.

Acanthocheilonema perstans

This parasite was found in only two females, a rate of 0.7% for both sexes.

Onchocerciasis

27.9% of males and 51.5% of females were positive for onchocerciasis. The discrepancy is partly due to the larger number of males under 15 years of age.

Foradugu is situated about 5 miles from the Rokel River as the crow flies, and the rate for both sexes is 42.1%

The youngest persons with nodules were a male aged 7 and a female aged 12.

The youngest with positive skin snips were a male aged 7 and a female aged 20.

The great trochanter region and the iliac crests were the commonest sites for nodules.

20.5% of persons had one nodule only, and only 6% had more than 10 nodules.

Dentition

The D.M.F. rates are 37.8% for males and 51.5% for females.

MALARIA

Table 75

FORADUGU

SPLENOMEGALY.

Both sexes N = 278

Class of Spleen	AGE GROUP				
	0-1	2-4	5-9	10-14	Adults
0	4	-	-	-	27
1	3	-	1	5	52
2	4	9	27	8	51
3	6	33	15	5	8
4	11	7	1	-	1
5	-	-	-	-	-

Both Sexes Spleen Rate 2 - 9 years = 100% Adults + 80.5%

Males N = 111

Class of Spleen	AGE GROUP				
	0-1	2-4	5-9	10-14	Adults
0	2	-	-	-	17
1	2	-	-	3	14
2	1	4	17	3	6
3	4	13	10	4	-
4	6	5	-	-	-
5	-	-	-	-	-

Males Spleen Rate 2 - 9 years = 100% Adult = 54%

Females N = 167

Class of Spleen	AGE GROUP				
	0-1	2-4	5-9	10-14	Adults
0	2	-	-	-	10
1	1	-	1	2	38
2	3	5	10	5	45
3	2	20	5	1	8
4	5	2	1	-	1
5	-	-	-	-	-

Females Spleen Rate 2 - 9 years = 100% Adult = 90%



FORADUGU

Table 76

Frequency of site of Onchocercomata

Site of Onchocercomata	Males	Females	Total	%
Sacrum	13	24	37	18.0
Gt. Trochanters	23	68	91	44.4
Iliac crests	19	58	77	37.6
Thorax	-	-	-	
Head	-	-	-	
Legs	-	-	-	
	55	150	205	

Table 77

Number of Onchocercomata per person

Number of Onchocercomata	Males	Females	Total	%
1	7	17	24	20.5
2	5	19	24	20.5
3	3	15	18	15.4
4	3	14	17	14.5
5	4	9	13	11.1
6	2	2	4	3.4
7	3	3	6	5.1
8	-	2	2	1.7
9	1	1	2	1.7
10 plus	3	4	7	6.0
	31	86	117	

One female, aged 20, was not examined because of trismus due to a large inflammatory swelling at the left angle of the mandible.

27.9% of males and 45.5% of females had gingivitis.

### Eyes

Two males and one female were blind. One boy aged 7 was blind in both eyes following measles years previously. He had scarring of both cornea. He was positive for onchocerciasis. A male aged 32 was blind in the left eye only for 5 years. He was positive for onchocerciasis and the eye lesions with marked anterior chamber involvement would indicate onchocerciasis as being a possible cause.

One female aged 63 was blind in the right eye which was shrunken and destroyed. The patient said that her eye had been destroyed 10 years ago by her daughter who was a witch. The daughter died 5 years ago at the age of 15.

Uniform opacities were present in 50.7% of both sexes.

Abnormal Vision was complained of by 9.0% of males and 19.8% of females. 6 males and 25 females complained of seeing 'Black objects' presumably microfilariae.

Hyperchoromotrichia: This was seen in one male (0.9%) and 32 (19.2%) females.

Nutritional Deficiency: 79.3% of the males and 91.0% of the females exhibited one or more signs of present or past nutrition deficiency.

Ulcers: 14.4% of males and 6.0% of females had ulcers.

Vaccination: 61.5% of both sexes have vaccination scars.

Venereal Disease: 15.3% of all males were suffering from or had suffered from an urethral discharge. 4 cases of active disease were seen.

This gives a rate of 45.9% for males and 15 years and over.

Other Conditions: Among the conditions seen during the course of the survey were the following:-

	Males	Females	Total
1. Ainhum	1	-	1
2. Deaf	2	-	-
	(aged 54,58)		
3. Dental Abcess	-	1	1
4. Diarrhoea	1	3	4
5. Dysentery	1	-	1
6. Epidermophytoses	3	4	7
7. Goitre	-	2	2
		(aged 52,60)	
8. Injury	2	2	4
9. Measles	6	16	22
10. Measles with Broncho - pneumonia	2	9	11
11. Measles with otitis-media	-	2	2
12. Pertussis	-	1	1
13. Scabies	9	8	17
14. Sepsis	6	13	19
15. Stammerer	2	-	2
	(aged 35,48)		
16. Stomatitis	1	1	1
	51	72	123

Patients seen outside sample at Foradugu

Age in Years	Males	Females	Total
Under 1	1	2	3
1 - 4	7	13	20
5 - 9	2	1	3
10 - 14	-	-	-
15 - 19	4	-	4
20 - 24	1	5	6
25 - 29	1	1	2
30 - 34	-	3	3
35 - 39	4	1	5
40 - 44	2	2	4
45 - 49	-	3	3
50 - 54	3	4	7
55 - 59	-	2	2
60 - 64	2	2	4
65 - 69	-	-	-
70 - 74	-	-	-
75 plus	-	-	-
	27	39	66

Conditions noted at Foradugu outside sample

1. Acute retention of urine	1
2. Conjunctivitis	1
3. Constipation	1
4. Gonorrhoea	1
5. Injury	1
6. Leprosy	1
7. Malaria.	33
8. Marasmus	1
9. Measles broncho-pneumonia	2
10. Onchocerciasis	7
11. Onchocerciasis with blindness	2
12. Poliomyelitis (Female aged 2 years paralysed left arm).	1
13. Pulmonary Tuberculosis.	1
14. Scabies	2
15. Sepsis	8
16. Tinea	1
17. Ulcer	3
18. Vomiting and Diarrhoea	2
19. Worms	3

#### 11.4.11. Physiological Data

Haemoglobin percent estimated by the Tallqvist method gave a mean level for males of 6.7 gms./100 ml. and for females 6.8 gms/100 ml.

#### 11.4.12. Fertility and Survival

Fertility and survival and the ages at which children died are set out in Tables 78 and 79.

##### Fertility

There were 17 live births (12 males, 5 females) in the year under review in a sample population of 278 persons, 111 males and 167 females,

The Crude Birth Rate is 61.1 per 1000

##### Fertility Rate

There were 76 females in the age groups 15 - 49 in Foradugu. These gave birth to 17 live births during the year a General Fertility Rate of 223.6 per 1000.

66 females aged 30 years and over gave birth to 332 live births. The mean number of children born alive to each female in these age groups is therefore 5.0.

Of the 76 females in the reproductive age groups, one was single, and two were divorced.

Of the 75 females who were married or had been married, 7 (9.3%) had never been pregnant. No unmarried female was pregnant.

TABLE 78

## FERTILITY AND SURVIVAL, FORADUGU.

## FEMALES

Age	Persons	Live Births			Stillbirths			Live Births in Last Year			Stillbirths in Last Year			Live Births dying within year			Multiple Pregnancies	Abortions	Children Dying			Non-Fertile Married Females	One Pregnancy Only
		M	F	T	M	F	T	M	F	T	M	F	T	M	F	T			M	F	T		
15 - 19	8	1	1	2	-	1	1	1	-	1	-	-	-	-	-	-	-	-	1	1	4	2	
20 - 24	14	14	12	26	1	-	1	3	-	3	-	-	-	-	-	-	5	3	5	8	2	3	
25 - 29	14	18	30	48	2	2	4	2	4	6	1	1	1	1	1	2	Twins MM	3	7	13	20	-	-
30 - 34	12	23	25	48	2	9	11	6	-	6	-	1	1	-	-	-	-	3	10	10	20	-	-
35 - 39	9	17	25	42	8	1	9	-	1	1	2	-	2	-	-	-	Twins MF	1	4	16	20	-	-
40 - 44	8	19	32	51	-	7	7	-	-	-	-	-	-	-	-	-	2 Twins FF : MF (1 Still FF)	5	10	14	24	-	-
45 - 49	11	23	21	44	6	-	6	-	-	-	-	-	-	-	-	-	-	2	10	13	23	-	4
50 - 54	5	16	10	26	-	-	-	-	-	-	-	-	-	-	-	-	-	2	11	3	14	-	1
55 - 59	7	20	24	44	3	2	5	-	-	-	-	-	-	-	-	-	Twins MM	5	19	15	34	-	-
60 - 64	10	32	30	62	6	2	8	-	-	-	-	-	-	-	-	-	( 4 Twins ) ( 3 FF:MM )	2	20	18	38	-	-
65 - 69	2	5	7	12	-	1	1	-	-	-	-	-	-	-	-	-	((1 Still MM)	1	4	1	5	-	-
70 - 74	1	2	1	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	3	-	-
75+	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
TOTAL	102	190	218	408	28	25	53	12	5	17	2	1	3	1	1	2	9 Twins ( 2 Still )	29	100	110	210	7	10

TABLE 79

FEMALES

AGES AT WHICH CHILDREN DIED, FORADUGU.

Age Group of Mother	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 - 59	60 - 64	65 - 69	70 - 74	75+	TOTAL	
N	8	14	14	12	9	8	11	5	7	10	2	1	1	102	
Age at Death	NUMBERS OF CHILDREN DYING													TOTAL	%
0 - 1m	-	2	4	4	3	4	3	2	1	3	1	-	-	27	12.8
2m - 12m	-	1	8	8	6	14	7	5	16	12	-	-	-	77	36.6
Years															
Under 1	-	3	12	12	9	18	10	7	17	15	1	-	-	104	49.4
1 - 4	1	4	8	6	8	4	9	1	11	14	2	-	-	68	32.4
5 - 9	-	1	-	1	3	2	3	3	5	4	-	-	-	22	10.4
10 - 14	-	-	-	1	-	-	1	-	1	1	-	-	-	4	1.9
15 - 19	-	-	-	-	-	-	-	3	-	2	2	1	-	8	3.8
20+	-	-	-	-	-	-	-	-	-	2	-	2	-	4	1.9
TOTAL	1	8	20	20	20	24	23	14	34	38	5	3	-	210	99.8



### Family Size

From the distribution of ever-married women by number of children born alive it can be seen that 15.1% of females of 30 and over had 4 live born children, and 13.6% had 6 live born children. For women of completed fertility the distribution of numbers of children born alive is fairly even. (Table 79a).

The average number of children born alive to females of this group was 5.1.

### Survival

From Table 79 the proportional rates for the children who died may be calculated. 12.8% of the children died under 1 month and 49.4% died under 1 year. Infant deaths - Toddler deaths ratio is 1.5.

### Infant Mortality Rate

2 out of the 17 children born alive in the last year died during the year.

The Infant Mortality Rate is 177.6 per 1000

Basing the calculation on all the females in the village, using the total number of live births, 408, and the number who died under one year of age, 104, the mortality rate for these infants is 254.9 per 1000.

### Stillbirth Rate

There were 3 stillbirths in the last year, among 20 live and still births, a rate of 150 per 1000.

Distribution of Ever-married women by Number of Children born alive

Present age of women	Number of women with the following number of children born alive												Total number of women	
	0	1	2	3	4	5	6	7	8	9	10	11		12
15 - 29	9	5	5	7	6	2	1	-	-	-	-	-	-	35
30 - 44	-	2	2	4	6	4	5	2	2	1	1	-	-	29
45 and over	2	6	2	2	4	3	4	4	3	3	3	1	-	37
TOTAL	11	13	9	13	16	9	10	6	5	4	4	1	-	101

There were 53 stillbirths recorded out of 461 live and stillbirths among the group of women investigated, a proportion of 114.9 per 1000 births, live and still.

#### Abortions

101 females in Foradugu who were married or had been married, had 29 abortions, a rate of 0.28 per female. There were 59.1 abortions per 1000 pregnancies.

#### Commentary

Foradugu is a village which appears to be growing in size and importance. Because of its local situation trading is a more common occupation than in the other villages.

## 12. Combined Villages

The data for the four villages studied was combined and compared in tables.

### 12.1. Census Data

This is set out in Tables 80, 81 and 82, the characteristics for each age and sex being combined.

Tables 84, 85 and 86 show the village totals for comparison.

#### Population Structure.

Females are more numerous than males in each village and in the combined villages, 44.3% being males and 55.7% being females out of a combined population of 1,010.

44.2% of the combined population is under 15 years old, and 24.1% is under 5 years of age.

In the age groups 20-39 there are 93 males (33.6%) and 183 females. This reflects the tendency of the males in the working age groups to leave the villages and seek employment elsewhere. This tends to occur seasonally during the slack farming period, so the figures would show this difference at its most marked.

In the 5-14 age groups there are 118 males compared with 85 females, but if the 48 Bundu girls being initiated at the time of the survey are included, this discrepancy will be corrected, making a total of 133 females in these age groups.

TABLE 80

## MALES

## CENSUS DATA, COMBINED VILLAGES.

Age	Persons	Group as % Total	Civil State					Tribe					Born in Village	Occupation							Religion				Literacy		
			Single	Married	Widowed	Divorced	Separated	Temne	Mende	Fulah	Limba	Creole		Other	House	Farmer	Trader	Industry	School	Koranic School	Child or None	Muslim	R.C.	Protestant	Pagan	Literate	Arabic
Under 1	33	7.4	33	-	-	-	-	31	2	-	-	-	-	28	-	-	-	-	-	-	33	32	-	1	-	-	-
1 - 4	94	21.0	94	-	-	-	-	92	1	-	-	-	1	70	-	4	-	-	1	-	89	91	-	1	2	-	-
5 - 9	84	18.7	84	-	-	-	-	77	1	1	3	-	2	69	4	59	-	1	21	21	14	80	1	-	3	-	-
10 - 14	34	7.6	34	-	-	-	-	33	-	-	-	-	1	28	4	29	1	1	3	19	-	34	-	-	-	-	-
15 - 19	20	4.5	18	2	-	-	-	18	-	-	-	-	2	15	1	15	2	1	3	10	-	19	1	-	-	1	1
20 - 24	17	3.8	9	8	-	-	-	15	1	1	-	-	-	14	1	13	2	4	1	6	-	16	-	1	-	1	-
25 - 29	28	6.2	5	23	-	-	-	24	-	1	-	-	3	19	-	25	1	4	1	12	-	24	1	-	3	1	-
30 - 34	19	4.2	1	17	1	-	-	19	-	-	-	-	-	17	-	17	-	2	-	6	-	19	-	-	-	-	-
35 - 39	29	6.5	2	24	-	1	2	24	-	1	3	-	1	20	-	23	1	5	1	6	-	28	-	1	-	1	-
40 - 44	18	4.0	-	17	-	-	1	16	-	-	2	-	-	14	-	15	1	3	-	9	-	16	-	1	1	-	-
45 - 49	25	5.6	1	23	-	1	-	23	-	-	1	-	1	22	-	24	-	1	-	5	-	23	-	-	2	-	1
50 - 54	13	2.9	-	11	1	-	1	12	-	-	-	-	1	11	-	13	-	-	-	5	-	12	-	-	1	-	1
55 - 59	16	3.6	-	16	-	-	-	15	-	-	-	-	1	15	-	15	2	-	-	2	-	14	-	-	2	-	-
60 - 64	8	1.8	-	6	2	-	-	8	-	-	-	-	-	7	-	8	1	-	-	4	-	8	-	-	-	-	2
65 - 69	7	1.6	-	6	1	-	-	7	-	-	-	-	-	7	-	7	-	-	-	1	-	7	-	-	-	-	-
70 - 74	1	0.2	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	-	1	-	1	-	-	-	-	-
75+	2	0.4	-	2	-	-	-	2	-	-	-	-	-	2	-	2	-	-	-	-	-	2	-	-	-	-	-
TOTAL	448		282	155	5	2	4	417	5	4	9	-	13	358	10	269	11	23	31	107	136	426	3	5	14	4	5
Percent			62.9	34.6	1.1	0.4	0.9	93.1	1.1	0.9	2.0	-	2.9	79.9	2.2	60.0	2.5	5.1	6.9	23.9	30.4	95.1	0.7	1.1	3.1	0.9	1.1

TABLE 81

## FEMALES.

## CENSUS DATA, COMBINED VILLAGES.

Age	Persons	Group as % Total	Civil State					Tribe						Born in Village	Occupation							Religion				Literacy	
			Single	Married	Widowed	Divorced	Separated	Temne	Mende	Fulah	Limba	Creole	Other		House	Farmer	Trader	Industry	School	Koranic School	Child or None	Muslim	R.C.	Protestant	Pagan	Literate	Arabic
Under 1	16	2.8	16	-	-	-	-	16	-	-	-	-	-	16	-	-	-	-	-	16	15	-	-	1	-	-	
1 - 4	100	17.8	100	-	-	-	-	96	-	1	1	-	2	84	2	3	-	-	4	1	94	97	-	-	3	-	-
5 - 9	63	11.2	63	-	-	-	-	58	-	3	-	-	2	45	17	37	2	-	7	5	19	55	2	-	6	1	-
10 - 14	22	3.9	20	2	-	-	-	22	-	-	-	-	-	17	10	18	2	-	5	1	-	18	2	-	2	2	-
15 - 19	24	4.3	5	19	-	-	-	24	-	-	-	-	-	17	20	19	5	-	-	-	-	23	-	-	1	-	-
20 - 24	55	9.8	-	54	1	-	-	55	-	-	-	-	-	24	49	43	13	-	1	-	-	43	-	1	11	1	-
25 - 29	59	10.5	-	56	2	1	-	58	-	1	-	-	-	27	46	52	9	1	-	1	-	53	-	-	6	-	-
30 - 34	43	7.7	-	40	1	1	1	39	-	3	-	-	1	22	36	38	9	1	-	5	-	41	-	-	2	-	-
35 - 39	26	4.6	-	24	1	1	-	24	-	-	-	-	2	13	22	21	7	4	-	-	-	21	-	-	5	-	-
40 - 44	28	5.0	-	24	4	-	-	24	-	1	1	-	2	11	20	25	5	1	1	2	-	26	-	1	1	1	-
45 - 49	38	6.8	-	33	4	-	1	35	-	-	-	-	3	22	34	35	8	3	-	2	-	35	-	-	3	-	1
50 - 54	16	2.8	-	15	-	-	1	15	-	-	-	-	1	9	9	13	4	3	-	3	-	16	-	-	-	-	-
55 - 59	26	4.6	-	14	11	-	1	22	-	1	-	-	3	19	19	24	1	1	-	3	-	26	-	-	-	-	-
60 - 64	20	3.6	-	12	6	-	2	18	-	-	-	-	2	15	15	18	7	1	-	2	-	19	-	-	1	-	-
65 - 69	8	1.4	-	2	6	-	-	8	-	-	-	-	-	6	6	5	1	2	-	-	-	8	-	-	-	-	-
70 - 74	10	1.8	-	5	5	-	-	9	-	-	-	-	1	6	9	6	-	-	-	-	-	10	-	-	-	-	-
75+	8	1.4	-	3	4	-	1	7	-	-	-	-	1	7	4	4	-	-	-	-	-	8	-	-	-	-	-
TOTAL	562		204	303	45	3	7	530	-	10	2	-	20	360	318	361	73	17	18	24	130	514	4	2	42	5	1
Percent.			36.3	53.9	8.0	0.5	1.2	94.3	-	1.8	0.4	-	3.6	64.1	56.6	64.2	13.0	3.0	3.2	4.3	23.1	91.5	0.7	0.4	7.5	0.9	0.2

TABLE 82

## CENSUS DATA, COMBINED VILLAGES.

TOTAL	P e r s o n s M F T			Group as % total	Civil State					Tribes						Occupation							Religion				Literacy.		
					Single	Married	Widowed	Divorced	Separated	Temne	Mende	Fulah	Limba	Creole	Other	Born in Village	House	Farmer	Trader	Industry	School	Koranic School	Child or None	Muslim	R.C.	Protestant	Pagan	Literate	Arabic
Under 1	33	16	49	4.9	49	-	-	-	-	47	2	-	-	-	44	-	-	-	-	-	49	49	47	-	1	1	-	-	
1 - 4	94	100	194	19.2	194	-	-	-	-	188	1	1	1	-	3	154	2	7	-	-	5	-	183	188	-	1	5	-	-
5 - 9	84	63	147	14.6	147	-	-	-	-	135	1	4	3	-	4	114	21	96	2	1	28	26	33	135	3	-	9	1	-
10 - 14	34	22	56	5.5	54	2	-	-	-	55	-	-	-	-	1	45	14	47	3	1	8	20	-	52	2	-	2	2	-
15 - 19	20	24	44	4.4	23	21	-	-	-	42	-	-	-	-	2	32	21	34	7	1	3	10	-	42	1	-	1	1	1
20 - 24	17	55	72	7.1	9	62	1	-	-	70	1	1	-	-	-	38	50	56	15	4	2	6	-	59	-	2	11	2	-
25 - 29	28	59	87	8.6	5	79	2	1	-	82	-	2	-	-	3	46	46	77	10	5	1	13	-	77	1	-	9	1	-
30 - 34	19	43	62	6.1	1	57	2	1	1	58	-	3	-	-	1	39	36	55	9	3	-	11	-	60	-	-	2	-	-
35 - 39	29	26	55	5.4	2	48	1	2	2	48	-	1	3	-	3	33	22	44	8	9	1	6	-	49	-	1	5	1	-
40 - 44	18	28	46	4.6	-	41	4	-	1	40	-	1	3	-	2	25	20	40	6	4	1	11	-	42	-	2	2	1	-
45 - 49	25	38	63	6.2	1	56	4	1	1	58	-	-	1	-	4	44	34	59	8	4	-	7	-	58	-	-	5	-	2
50 - 54	13	16	29	2.9	-	26	1	-	2	27	-	-	-	-	2	20	9	26	4	3	-	8	-	28	-	-	1	-	4
55 - 59	16	26	42	4.1	-	30	11	-	1	37	-	1	-	-	4	34	19	39	3	1	-	5	-	40	-	-	2	-	-
60 - 64	8	20	28	2.8	-	18	8	-	2	26	-	-	-	-	2	22	15	26	8	1	-	6	-	27	-	-	1	-	2
65 - 69	7	8	15	1.5	-	8	7	-	-	15	-	-	-	-	-	13	6	12	1	2	-	1	-	15	-	-	-	-	-
70 - 74	1	10	11	1.1	1	5	5	-	-	10	-	-	-	-	1	6	9	6	-	1	-	1	-	11	-	-	-	-	-
75+	2	8	10	1.0	-	5	4	-	1	9	-	-	-	-	1	9	4	6	-	-	-	-	-	10	-	-	-	-	-
TOTAL	448	562	1010		486	458	50	5	11	947	5	14	11	-	33	718	328	630	84	40	49	131	266	940	7	7	56	9	6
Percent	44.3	55.7	100		48.1	45.3	5.0	0.5	1.1	93.8	0.5	1.4	1.1	-	3.3	71.1	32.5	62.4	8.3	4.0	4.9	13.0	26.3	93.1	0.7	0.7	5.5	0.9	0.6

The population under 20 is much larger than the population between 20 and 40 (490:276) so that, apart from emigration, the population will tend to increase. This trend is the same in Lunsar and all the villages.

64% of the population is 60 and over. This is similar to the rate for the population of Great Britain in 1891.

During the course of the survey it was not possible to measure the migration, temporary or permanent, from the villages. It would have been interesting to do censuses in the same villages at the height of agricultural activity, for comparison with those already taken. In this connection it may be noted that a census of Romende, a village near Foradugu, was taken on 14th October, 1959, and showed the same male:female imbalance, 73 males: 109 females, especially marked in the middle age groups.

#### Civil State

34.6% of all males and 53.9% of all females were married.

48 (75.0%) out of 64 males between 20 and 35 years were married.

All females in these age groups were married. It is unusual for males under 20 and for females under 15 to be married. The youngest married female was aged 12 years (Mawulay-Mamanso). In the 15-19 group 19 (79%) out of 24 females were married. In the age group 45 - 54



97.3% of males and all females had been married.

### Polygyny

Out of 155 married males, 50.9% had one wife only, at the time of the enquiry. 31.6% had two wives, 8.4% had three and 6.5% had four wives. 6, 8, 9 and 10 wives were recorded for four individuals.

Thus 49.1% of marriages were polygynous. See Table 83.

### Tribe

Temne are 93.8% of the population of the combined villages. The next largest group are the Mandingo of whom there are 29 (2.8%), Fulah are third in numerical order, the Limba fourth.

### Birthplace

79.9% of the males and 64.1% of the females were born in the villages in which they were resident.

### Occupation

Many persons had more than one occupation.

'House' 2.2% of males and 56.7% of females gave this as their occupation.

'Farmer' This was the dominant occupation of the villages as would be expected 60.0% of males and 64.2% of females gave this as their stated occupation. Since 26.3% of both sexes were children or had no occupation it follows that about 90% of the population over the age of 10 were engaged in farming. The lowest farming rate is at

Table 83

Polygyny. Combined Villages

Number of Living Wives per Married Male

Married Males		Number of Living Wives										Total Wives
Age in years	N	1	2	3	4	5	6	7	8	9	10	
15 - 19	2	2	-	-	-	-	-	-	-	-	-	2
20 - 24	8	6	2	-	-	-	-	-	-	-	-	10
25 - 29	23	15	8	-	-	-	-	-	-	-	-	31
30 - 34	17	6	8	3	-	-	-	-	-	-	-	31
35 - 39	24	10	9	5	-	-	-	-	-	-	-	43
40 - 44	17	11	4	1	1	-	-	-	-	-	-	26
45 - 49	23	9	9	2	3	-	-	-	-	-	-	45
50 - 54	11	3	6	-	1	-	-	-	-	1	-	28
55 - 59	16	10	2	1	1	-	1	-	-	-	1	37
60 - 64	6	1	-	1	4	-	-	-	-	-	-	20
65 - 69	6	4	1	-	-	-	-	-	1	-	-	14
70 - 74	-	-	-	-	-	-	-	-	-	-	-	-
75 plus	-	2	-	-	-	-	-	-	-	-	-	2
TOTAL	155	79	49	13	10	-	1	-	1	1	1	289
PERCENT		50.9	31.6	8.4	6.5	-	0.6	-	0.6	0.6	0.6	

Foradugu, compensated by a higher trading rate. This is probably due to the situation of the village on the main road.

'Trader' 2.5% of males and 13.0% of females were traders.

As should be expected from the number and size of the shops Foradugu had the most at 17.3% of persons and Mawulay-Mamanso and Kamasundu the least at 2.3% and 3.8% respectively.

'Industry' As has already been stated, this designation in the villages means the production of handicrafts or salaried work. 5.1% of males and 3.0% of females were engaged in these activities.

The following is the list of village 'Industries' recorded:

MALES		FEMALES	
Blacksmith	1	Basket maker	3
Blacksmith's apprentice	3	Fish net maker	2
Carpenter	3	Dyer of Clothes	6
Clerk to native administration	2	Head tie maker	2
Court Messenger (Chiefdom Police)	4	Mat maker	2
Diamond Digger	1	Midwife - Government	1
Ferryman	5	Pillow maker	2
Goldsmith (from Freetown)	1	Potter	1
Public Works Dept. Overseer	1	Preparation of food for sale	1
Tailor	2	Snuff maker	3

'School' 6.9% of males and 3.2% of females were at school or had been at school. There is great variability in this factor. There were none at school in Mawulay-Mamanso, one in Kamasundu, Masimera had 5.0% and Foradugu 12.9%. Only Masimera and Foradugu have schools. 23.9% of males and 4.3% of females were attending or had attended the Koranic school.

'Religion' 93.1% of both sexes were Muslim. Pagans are next in numerical order being 5.5% of both sexes. There is 0.7% of both sexes who are Roman Catholic and Protestant.

#### Literacy

0.9% of both sexes are literate in English, and 0.6% of both sexes literate in Arabic.

#### Comparison of Village Totals

See Tables 84, 85 and 86. It will be seen that the villages resemble each other in most respects.

Foradugu differs in that there are more single males than the other villages, the majority of these being under 10 years. The rate for school attenders is very much higher than at any other village. Foradugu and Masimera have schools in the village. These are the villages in which there are a few literates in English, 2.5% and 1.1% respectively.

TABLE 84.

## MALES

## CENSUS DATA, VILLAGE TOTALS.

	Persons	CIVIL STATE					TRIBE						Born in Village	OCCUPATION								RELIGION				LITERACY	
		Single	Married	Widowed	Divorced	Separated	Temne	Mende	Fulah	Limba	Creole	Other		House	Farmer	Trader	Industry	School	Koranic School	Child or None	Muslim	R.C.	Protestant	Pagan	Literate	Arabic	
Masimera	111	65	45	-	-	1	106	2	-	3	-	-	81	2	70	3	6	4	26	32	100	2	2	7	2	4	
%		58.6	40.5	-	-	0.9	95.5	1.8	-	2.7	-	-	73.0	1.8	63.1	2.7	5.4	3.6	23.4	28.8	90.1	1.8	1.8	6.3	1.8	3.6	
Kamasundu	171	100	65	2	2	2	154	-	1	4	-	12	158	-	115	1	8	1	49	47	166	1	-	4	-	-	
%		58.5	38.0	1.2	1.2	1.2	90.1	-	0.6	1.3	-	7.0	92.4	-	67.3	0.6	4.7	0.6	28.7	27.5	97.1	0.6	-	2.3	-	-	
Mawulay-Mamanso	55	34	19	1	-	1	53	-	1	1	-	-	35	-	40	1	5	-	13	13	54	-	-	1	-	-	
%		61.8	34.5	1.8	-	1.8	96.4	-	1.8	1.8	-	-	63.6	-	72.7	1.8	9.1	-	23.6	23.6	98.2	-	-	1.8	-	-	
Foradugu	111	83	26	2	-	-	104	3	2	1	-	1	84	8	44	6	4	26	19	44	106	-	3	2	2	1	
%		74.8	23.4	1.8	-	-	93.7	2.7	1.8	0.9	-	0.9	75.7	7.2	39.6	5.4	3.6	23.4	17.1	39.6	95.5	-	2.7	1.8	1.8	0.9	
TOTAL	448	282	155	5	2	4	417	5	4	9	-	13	358	10	269	11	23	31	107	136	426	3	5	14	4	5	
Percent		62.9	34.6	1.1	0.4	0.9	93.1	1.1	0.9	2.0	-	2.9	79.9	2.2	60.0	2.5	5.1	6.9	23.9	30.4	95.1	0.7	1.1	3.1	0.9	1.1	

TABLE 85

## CENSUS DATA, VILLAGE TOTALS.

## FEMALES

	Persons	Civil State					Tribe						Born in Village	Occupation							Religion				Literacy.	
		Single	Married	Widowed	Divorced	Separated	Temne	Mende	Fulah	Limba	Creole	Other		House	Farmer	Trader	Industry	School	Koranic School or Child or None	Muslim	R.C. Protestant	Pagan	Literate	Arabic		
Masimera	128	45	70	13	-	-	126	-	-	-	-	2	84	72	84	16	3	8	2	26	108	4	1	15	4	1
%		35.2	54.7	10.2	-	-	98.4	-	-	-	-	1.6	65.6	56.3	65.6	12.5	2.3	6.3	1.6	20.3	84.4	3.1	0.8	11.7	3.1	0.8
Kamasundu	193	65	112	13	-	3	176	-	6	-	-	11	137	97	137	13	5	-	9	41	175	-	-	18	-	-
%		33.7	58.0	6.7	-	1.6	91.2	-	3.1	-	-	5.7	71.0	50.3	71.0	6.7	2.6	-	4.7	21.2	90.7	-	-	9.3	-	-
Mawulay-Mamanso	74	28	35	9	1	1	72	-	1	1	-	-	36	39	56	2	-	-	7	17	67	-	-	7	-	-
%		37.8	47.3	12.2	1.4	1.4	97.2	-	1.4	1.4	-	-	48.6	52.7	75.7	2.7	-	-	9.5	23.0	90.5	-	-	9.5	-	-
Foradugu	167	66	86	10	2	3	156	-	3	1	-	7	103	110	84	42	9	10	6	46	164	-	1	2	1	-
Percent		39.5	51.5	6.0	1.2	1.8	93.4	-	1.8	0.6	-	4.2	61.7	65.9	50.3	25.1	5.4	6.0	3.6	27.5	98.2	-	0.6	1.2	0.6	-
TOTAL	562	204	303	45	3	7	530	-	10	2	-	20	360	318	361	73	17	18	24	130	514	4	2	42	5	1
Percent		36.3	53.9	8.0	0.5	1.2	94.3	-	1.8	0.4	-	3.6	64.1	56.6	64.2	13.0	3.0	3.2	4.3	23.1	91.5	0.7	0.4	7.5	0.9	0.2

TABLE 86

## CENSUS DATA, VILLAGE TOTALS

TOTAL

	persons			Single	Married	Widowed	Divorced	Separated	Temne	Mende	Fulah	Limba	Creole	Other	Born in Village	House	Farmer	Trader	Industry	School	Koranic School	Child or none	Muslim	R.C.	Protestant	Pagan	Literate	Arabic
	M	F	T																									
Masimera	111	128	239	110	115	13	-	1	232	2	-	3	-	2	165	74	154	19	9	12	28	58	208	6	3	22	6	5
%				46.0	48.1	5.4	-	0.4	97.1	0.8	-	1.3	-	0.8	69.0	31.0	64.4	7.9	3.8	5.0	11.7	24.3	87.0	2.5	1.3	9.2	2.5	2.1
Kamasundu	171	193	364	165	177	15	2	5	330	-	7	4	-	23	295	97	252	14	13	1	58	88	341	1	-	22	-	-
%				45.3	48.6	4.1	0.5	1.4	90.7	-	1.9	1.1	-	6.3	81.0	26.6	69.2	3.8	3.6	0.3	15.9	24.2	93.7	0.3	-	6.0	-	-
Mawulay-Mamanso	55	74	129	62	54	10	1	2	125	-	2	2	-	-	71	39	96	3	5	-	20	30	121	-	-	8	-	-
%				48.1	41.9	7.8	0.8	1.6	96.9	-	1.6	1.6	-	-	55.0	30.2	74.4	2.3	3.9	-	15.5	23.3	93.8	-	-	6.2	-	-
Foradugu	111	167	278	149	112	12	2	3	260	3	5	2	-	8	187	118	128	48	13	36	25	90	270	-	4	4	1.3	1.1
%				53.6	40.3	4.3	0.7	1.1	93.5	1.1	1.8	0.7	-	2.9	67.3	42.4	46.0	17.3	4.7	12.9	9.0	32.4	97.1	-	1.4	1.4	1.1	0.4
TOTAL	448	562	1010	486	458	50	5	11	947	5	14	11	-	33	718	328	630	84	40	49	131	266	940	7	7	56	9	6
%	44.3	55.7	100	48.1	45.3	5.0	0.5	1.1	93.8	0.5	1.4	1.1	-	3.3	71.1	32.5	62.4	8.3	4.0	4.9	13.0	26.3	93.1	0.7	0.7	5.5	0.9	0.6

## 12.2. Housing

Housing data is listed in Table 87, and compared with Lunsar.

Foradugu has the highest density of persons per room and per house, yet the latrine accommodation is the best of all the villages, probably due to the efforts of the health inspector. Lunsar has almost twice as many persons per house as the average village.

Kamasundu is the only village with more houses of the traditional round style than rectangular. In all the villages, however, there are more thatched houses than those roofed with corrugated iron, whereas Lunsar has more houses with corrugated iron roofs.

The typical house, whether round or rectangular has a large central room with rooms at the sides. These side rooms may be entered either from the central room or from one of the front or back verandahs.

In some rooms there is a raised mud platform, some 2 feet high which is used for sleeping.

Furniture is scanty. There are usually beds, made of wood and a few stools, chairs and tables. The inhabitants spend most of their time outside the house or on the verandah, especially during the rain.

## Overcrowding

In the combined villages 29 houses were overcrowded out



Table 87

## HOUSING IN VILLAGES, AND LUNSAR.

Name of Village	Total No. Houses	Total Inhabited Houses	S H A P E		R O O F		Total No. Rooms	Rooms per House	Total Inhabited Rooms	Estimated No. of Persons	Actual No. of Persons	Persons per House	Persons per Room	Persons per Family Unit	Family Units per House	Persons per Latrine.
			Round	Rectangular	Thatch	Pan										
MASIMERA %	26	25	8 31%	18 69%	18 69%	8 31%	134	5	132	233	239	9.6	1.8	8.5	1.1	20
KAMASUNDU %	52	47	36 69%	16 31%	36 69%	16 31%	228	4.3	218	381	364	7.7	1.6	5.5	1.4	18
MAWULAY-MAMANSO %	16	15	4 25%	12 75%	12 75%	4 25%	75	4.7	71	156	129	8.6	11.8	10 .7	0.8	32
FORADUGU %	47	47	4 8.5%	43 91.5%	26 55.3%	21 44.7%	273	5.8	273	531	278	11.8	2	7. 2	1.6	14
TOTAL %	141	134	52 37%	89 63%	92 64.5%	49 35.5%	710	5.0	694	1301	1010	9.6	1.8	7.0	1.3	17
LUNSAR %	579	579	5 0.8%	574 99.2%	269 46.5%	310 53.5%	4670	8.0	670	9540	954	16.4	2	5.7	2.7	18

of 110, i.e., 26.3%. Foradugu had almost as high a rate of overcrowding as Lunsar.

### 12.3. Clinical Data, Combined Villages

The data for the combined villages are shown in Tables 88, 89, 90, 91, 92 and 93. Tables 94, 95, and 96 give villages totals for comparison.

#### 12.3.1. Morbidity

The rates for disease prevalence are higher, in most cases for females, than for males. This is the opposite of the situation in Lunsar. This may be influenced by the age and sex structure of the villages. There are 203 males compared with 361 females at ages 15 years and over, and since some diseases have high positive rates in the older age groups, the rate for the sex is proportionately higher.

#### Malaria

In the total village sample, blood films were taken from 1,003 persons out of a total of 1,010, being 99.3% of the total population.

#### Morbidity rate

This is very rarely measured in malaria. It was noted that when persons were asked "How are you keeping?" the same replies in many cases were repeated by different persons. These replies thought to be associated with malaria fell into the following groups:-

Table 88  
Clinical data, combined villages

Males

Males

Age	Persons	Parasitaemia				Onchocerciasis					Dentition				Eyes			Lips			Tongue				Bones				Nutrition			Illness			Ulcers		Scars		Herniae		Skin			
		Blood film taken	<i>P. falciparum</i> present	Gametocytes present	<i>A. perstans</i>	Skin snip taken	mf. <i>O. volvulus</i> present	<i>Onchocerca</i> present	Onchocerciasis positive	Onchodermatitis present	Caries	Missing	D.M.F.	Gingivitis	Opacities in eyes	Abnormal	Blind	Hypochromotrichia	Normal	Cheilosis	Angular stomatitis	Normal	Glossitis	Fissured	Geographical	Normal	Bossed	Beaded ribs	Bow legs	Nutritional deficiency present	V.D. present or past	Complains of illness	Ulcers present	Vaccination present	Other scars	Umbilical	Other	Lichenified	Depigmented	Loss elasticity	Xerosis			
Under 1	33	33	26	6	-	-	-	-	-	-	-	-	-	-	-	-	33	-	-	33	-	-	-	33	-	-	-	-	-	20	-	-	1	25	-	-	-	-	-	-	-			
1-4	94	94	94	31	-	12	-	-	-	18	-	18	14	-	-	-	4	41	42	49	90	3	-	1	91	2	3	-	61	-	60	4	19	24	81	-	4	-	-	1				
5-9	84	83	83	11	1	82	6	6	10	-	29	4	29	22	4	-	1	13	64	58	72	10	2	-	83	-	-	1	74	-	41	11	53	50	79	-	43	-	-	1				
10-14	34	34	34	1	1	34	10	12	12	-	11	-	11	9	10	-	1	2	29	23	28	5	3	-	34	-	-	-	31	-	22	-	27	20	27	1	21	-	-	-				
15-19	20	20	19	3	-	19	10	10	12	-	9	2	9	6	15	-	-	2	16	10	18	1	1	-	19	1	-	-	19	5	16	2	14	13	12	-	14	-	-	-				
20-24	17	17	16	1	-	17	8	11	11	3	8	2	8	7	15	-	-	4	11	9	12	3	2	-	17	-	-	-	13	3	14	2	10	11	6	-	11	1	1	-				
25-29	28	28	26	1	1	28	23	23	23	3	17	4	18	14	27	5	-	7	14	15	17	4	7	-	28	-	-	-	21	15	25	1	24	18	9	1	22	4	-	-				
30-34	19	19	19	5	2	19	14	14	17	2	14	6	14	13	18	1	1	2	13	13	13	3	4	-	19	-	-	-	16	8	15	4	16	10	4	-	17	3	-	-				
35-39	29	29	24	2	-	29	23	23	25	5	24	17	24	21	29	2	-	15	10	12	22	2	6	-	29	-	-	-	13	14	23	-	27	15	3	-	16	3	1	-				
40-44	18	17	17	-	2	18	11	14	14	5	14	10	14	12	18	3	-	9	5	8	12	2	4	-	18	-	-	-	9	9	14	3	16	10	6	-	15	2	-	-				
45-49	25	25	22	2	1	25	20	20	22	6	19	17	19	22	22	9	1	8	7	16	18	1	6	-	25	-	-	-	17	12	19	2	22	13	2	-	20	4	2	1				
50-54	13	13	11	-	-	11	9	10	10	3	12	11	12	11	13	5	-	7	6	4	7	2	3	1	13	-	-	-	6	8	12	-	10	6	7	1	12	-	-	-				
55-59	16	15	14	-	-	15	10	13	13	7	15	11	16	12	16	7	-	7	7	6	11	-	5	-	16	-	-	-	9	7	15	2	11	13	1	2	13	1	2	1				
60-64	8	8	7	-	-	8	5	6	6	3	8	7	8	7	8	3	-	4	-	4	7	-	1	-	8	-	-	-	4	3	5	-	7	5	1	2	7	2	-	-				
65-69	7	7	6	-	-	7	6	6	6	3	7	6	7	7	7	2	-	2	4	4	3	-	4	-	7	-	-	-	4	4	5	-	5	2	3	1	7	2	-	-				
70-74	1	1	-	-	-	1	-	1	1	-	1	1	1	1	1	1	-	1	-	-	1	-	-	-	1	-	-	-	1	-	1	1	1	-	-	1	-	-	-					
75+	2	2	2	-	-	1	-	-	1	1	2	2	2	2	2	2	-	1	1	-	-	1	1	-	2	-	-	-	1	-	1	-	1	-	-	1	1	-	-					
Total	448	445	420	63	8	326	155	169	183	41	208	100	210	180	205	39	3	6	158	229	231	364	37	49	2	443	3	3	1	298	89	307	32	262	213	266	8	226	23	6	4			
%		99.3	94.4	15.0	1.8	72.8	47.5	37.7	40.8	22.4	46.4	22.3	46.9	40.2	45.8	8.7	0.7	1.3	35.3	51.1	51.6	81.3	8.3	10.9	0.4	98.9	0.7	0.7	0.2	66.5	19.8	68.5	7.1	58.5	47.5	59.4	1.8	50.4	5.1	1.3	0.9			

Table 89

Clinical data, combined villages

Females

Females

Age	Persons	Parasitaemia				Onchocerciasis					Dentition				Eyes			Hair	Lips			Tongue				Bones				Nutrition	Illness		Ulcers	Scars	Herniae		Skin						
		Blood film taken	P. falciparum present	Gametocytes present	A. Perstans	Skin snip taken	mf. O. volvulus present	Onchocercomata present	Onchocerciasis positive	Onchodermatitis present	Caries	Missing	D.M.F.	Gingivitis	Opacities in eyes	Abnormal	Blind	Hypochromotrichia	Normal	Cheliosis	Angular stomatitis	Normal	Glossitis	Fissures	Geographical	Normal	Bossed skull	Beaded ribs	Bow legs	Nutritional deficiency present	V.D. present or past	Complains of illness	Ulcers present	Vaccination present	Other scars	Umbilical	Other	Lichenified	Depigmented	Loss elasticity	Xerosis		
Under 1	16	15	12	2	-	-	-	-	-	-	-	-	-	-	-	-	16	-	-	16	-	-	-	16	-	-	-	-	-	10	-	-	-	11	-	-	-	-	-	-	-		
1-4	100	100	100	21	-	13	1	1	1	-	20	3	21	20	-	1	62	30	57	61	90	10	-	-	98	1	-	1	86	-	84	5	27	28	90	-	13	-	-	1			
5-9	63	63	63	8	-	59	4	5	7	-	33	8	34	18	1	-	39	12	42	44	57	6	-	-	63	-	-	-	61	-	40	3	35	27	51	-	21	1	-	-			
10-14	22	22	21	3	-	22	1	5	6	-	4	-	4	2	6	-	9	3	15	16	19	2	1	-	22	-	-	-	19	-	16	2	16	17	16	-	7	-	-	1			
15-19	24	24	23	4	-	23	5	9	11	1	4	-	4	1	23	1	-	2	21	18	16	3	5	1	24	-	-	-	22	-	16	1	19	16	13	-	16	-	-	-			
20-24	55	54	50	5	2	54	21	30	35	1	21	12	22	17	54	2	-	11	34	30	40	7	8	1	55	-	-	-	43	-	42	4	41	38	27	-	25	-	1	-			
25-29	59	59	55	6	-	58	28	42	44	2	45	21	46	28	53	2	1	-	11	36	38	39	7	11	3	59	-	-	-	50	-	49	-	41	44	33	-	34	2	-	-		
30-34	43	43	37	1	1	43	25	35	35	3	31	21	31	26	41	4	-	-	8	27	27	27	3	13	2	43	-	-	-	35	-	37	-	33	28	21	21	26	2	-	-		
35-39	26	26	24	1	-	25	14	18	18	4	18	12	18	14	23	5	-	-	5	19	16	19	3	3	-	26	-	-	-	21	-	20	-	19	12	9	-	14	1	-	-		
40-44	28	28	26	2	-	28	17	26	27	3	21	19	23	20	28	13	-	-	7	15	20	21	3	4	-	28	-	-	-	28	-	26	2	24	19	5	-	21	3	-	-		
45-49	38	38	37	3	2	38	18	33	34	5	37	28	37	35	38	13	-	-	9	20	24	23	5	9	1	38	-	-	-	29	-	36	-	25	26	4	-	27	4	1	-		
50-54	16	16	15	-	-	15	8	14	14	1	15	14	15	14	15	9	-	-	6	5	9	10	4	2	-	16	-	-	-	12	-	13	2	12	11	-	-	13	-	1	-		
55-59	26	25	20	-	-	25	12	20	20	3	25	24	25	16	26	13	-	-	3	18	17	13	1	12	-	26	-	-	-	24	-	24	2	20	14	3	-	21	3	1	-		
60-64	20	20	17	1	-	19	15	18	19	8	20	19	20	19	20	10	3	-	5	13	13	14	2	5	-	20	-	-	-	15	-	19	-	15	13	3	-	15	2	2	1		
65-69	8	8	7	-	-	7	5	6	6	2	8	8	8	7	8	5	-	-	5	3	2	6	-	1	1	8	-	-	-	4	7	3	3	3	3	3	3	3	3	3	3	3	3
70-74	10	10	6	-	-	10	7	9	10	2	9	8	9	8	9	4	2	-	4	5	4	2	2	6	-	10	-	-	-	6	-	10	-	7	7	3	-	7	1	4	1		
75+	8	7	5	-	-	6	2	5	5	2	6	7	7	3	8	5	2	-	1	6	6	6	1	1	-	8	-	-	-	7	-	8	1	6	2	-	-	7	2	1	-		
Total	562	558	518	57	5	445	183	276	292	37	317	204	324	248	353	86	9	111	138	336	345	418	59	81	9	560	1	-	1	457	-	457	25	347	306	290	-	274	21	12	4		
%		99.3	92.8	11.0	0.9	79.2	41.1	49.1	52.0	12.7	56.4	36.3	57.7	44.1	62.8	15.3	1.6	19.8	24.6	59.8	61.4	74.4	10.5	14.4	1.6	99.6	0.2	-	0.2	81.3	-	81.3	4.4	61.7	54.4	51.6	-	48.8	3.7	2.1	0.7		

Table 90

Clinical data, combined villages

Total

Total

Age	Persons	Parasitaemia				Onchocerciasis					Dentition				Eyes			Hair	Lips			Tongue				Bones				Nutrition		Illness		Ulcers		Scars		Herniae		Skin			
		Blood film taken	P. falciparum present	Gametocytes present	A. perstans	Skin snip taken	mf. O volvulus present	Onchocercomata present	Onchocerciasis positive	Onchodermatitis present	Caries	Missing	D.M.F.	Gingivitis	Opacities in eyes	Abnormal	Blind	Hypochromotrichia	Normal	Cheilosis	Angular stomatitis	Normal	Glossitis	Fissured	Geographical	Normal	Bossed skull	Beaded ribs	Bow legs	Nutritional deficiency present	V.D. present or past	Complains of illness	Ulcers present	Vaccination present	Other scars	Umbilical	Other	Lichenified	Depigmented	Loss elasticity	Xerosis		
Under 1	49	48	38	8	-	-	-	-	-	-	-	-	-	-	-	-	49	-	-	49	-	-	-	49	-	-	-	-	-	30	-	-	1	36	-	-	-	-	-	-	-		
1-4	194	194	194	52	-	25	1	1	1	38	3	39	34	-	1	66	71	99	110	180	13	-	1	189	3	3	1	147	-	144	9	46	52	171	-	17	-	-	2				
5-9	147	146	146	19	1	141	10	11	17	62	12	63	40	5	1	40	25	106	102	129	16	2	-	146	-	-	1	135	-	81	14	88	77	130	-	68	1	-	1				
10-14	56	56	55	4	1	56	11	17	18	15	-	15	11	16	-	10	5	44	39	47	7	4	-	56	-	-	-	50	-	38	2	43	37	43	1	28	-	-	1				
15-19	44	44	42	7	-	42	15	19	23	13	2	13	7	38	1	-	4	37	28	34	4	6	1	43	1	-	-	41	5	32	3	33	29	25	-	30	-	-	-				
20-24	72	71	66	6	2	71	29	41	46	29	14	30	24	69	2	-	15	45	39	52	10	10	1	72	-	-	-	56	3	56	6	51	49	33	-	36	1	2	-				
25-29	87	87	81	7	1	86	51	65	67	62	25	64	42	80	7	1	18	50	53	56	11	18	3	87	-	-	-	71	15	74	1	65	62	42	1	56	6	-	-				
30-34	62	62	56	6	3	62	39	49	52	45	27	45	39	59	5	1	10	40	40	40	6	17	2	62	-	-	-	51	8	52	4	49	38	25	-	43	5	-	-				
35-39	55	55	48	3	3	54	37	41	43	42	29	42	35	52	7	-	20	29	28	41	5	9	-	55	-	-	-	34	14	43	-	46	27	12	-	32	4	1	-				
40-44	46	45	43	2	2	46	28	40	41	35	29	37	32	46	16	-	16	20	28	33	5	8	-	46	-	-	-	32	9	40	5	40	29	11	-	36	5	-	-				
45-49	63	63	59	5	3	63	38	53	56	56	45	56	57	60	22	1	17	27	40	41	6	15	1	63	-	-	-	46	12	55	2	47	39	6	-	47	8	3	1				
50-54	29	29	26	-	-	26	17	24	24	27	25	27	25	28	14	-	13	11	13	17	6	5	1	29	-	-	-	18	8	25	2	22	17	7	1	25	-	1	-				
55-59	42	40	34	-	-	40	22	33	33	40	35	41	28	42	20	-	10	25	23	24	1	17	-	42	-	-	-	33	7	39	4	31	27	4	2	34	4	3	1				
60-64	28	28	24	1	-	27	20	24	25	28	26	28	26	28	13	3	9	13	17	21	2	6	-	28	-	-	-	19	3	24	-	22	18	4	2	22	4	2	1				
65-69	15	15	13	-	-	14	11	12	12	15	14	15	14	15	7	-	7	7	6	9	-	5	1	15	-	-	-	8	4	12	3	12	6	4	1	14	2	1	-				
70-74	11	11	6	-	-	11	7	10	11	10	9	10	9	10	4	2	5	5	4	3	2	6	-	11	-	-	-	6	1	10	1	8	8	3	-	8	1	4	1				
75+	10	9	7	-	-	7	2	5	6	8	9	9	5	10	7	2	2	7	6	6	2	2	-	10	-	-	-	8	-	9	1	6	3	-	-	8	3	1	-				
Total	1010	1003	938	120	13	771	338	445	475	78	525	304	534	428	558	125	12	117	296	565	576	782	96	130	11	1003	4	3	2	755	89*	764	57	609	519	556	8	500	44	18	8		
%		99.3	93.5	12.8	1.3	76.3	43.8	44.1	47.0	16.4	52.0	30.1	52.9	42.4	55.2	12.5	1.2	11.6	29.3	55.9	57.0	77.4	9.5	12.9	1.1	99.3	0.4	0.3	0.2	74.8	19.8	75.6	5.6	60.3	51.4	55.0	0.8	49.5	4.4	1.8	0.8		

\* males only

1. "Severe headache". So severe that the head was shaved down the middle or mud applied, or incisions over the malar bones were made.
2. "Pain all over body".
3. "Pain on chest, or back".
4. "Pain in bones, hips".
5. "Large spleen".

It was found that 304 out of 1010 persons (30%) complained of one or more of these symptoms.

During the field work, the classical clinical picture of malaria was seen on several occasions in Africans. In fact, on one occasion, my dispenser, a healthy young man of 26 years, was so ill with malaria that he had to go to hospital in spite of immediate and intensive treatment with chloroquine.

The symptoms listed above are not exclusive to malaria by any means, yet this complaint rate does indicated that there is considerable disability in the population. It should be pointed out that these symptoms disappear if anti-malarial drugs are given.

#### Parasite-rate

Rates for the individual villages and the combined villages are given in the tables. 94.4% of males and 92.8% of females were positive for Plasmodium falciparum.

The combined rate, both sexes, all ages is 93.5%, Plasmodium falciparum with a gametocyte rate of 12.8%, 15.0% for males and 11.0% for females. The combined infant parasite-rate, i.e., that of children under 1 year is 79%.

Only Plasmodium falciparum infections were seen.

A comparison of rates between the four villages shows little variation.

#### Spleen-rates

Splenomegaly tables are given for each sex separately and both together for each village and for combined villages, with Lunsar for comparison.

The rates are set out in the accompanying table.

The following classification is given by the World Health Organisation for types of malarial endemicity:-

Hypoendemic	: spleen-rate 2 - 9 years, 0 - 10%
Mesoendemic	: spleen-rate 2 - 9 years, 11 - 50%
Hyperendemic	: spleen-rate 2 - 9 years, constantly over 50%. Adult spleen-rate also high.
Holoendemic	: spleen-rate 2 - 9 years, constantly over 75%. Adult spleen-rate low; adult tolerance high.

According to Macdonald (1957) the degrees of endemicity "seem to run into one consecutive series. There is, however, some convenience in classification which is harmless provided no emphasis is placed on the lines of division of categories".

MALARIA

Table 91  
SPLENOMEGALY.

COMBINED VILLAGES

Both sexes N = 1,010

Class of Spleen	AGE GROUP				
	0 - 1	2 - 4	5 - 9	10 - 14	Adults
0	19	1	1	1	213
1	10	7	16	16	169
2	10	29	72	29	154
3	21	87	53	9	25
4	23	33	5	1	2
5	1	2	-	-	1

Spleen Rate 2-9 years = 99.3% Adult = 62%

Males N = 448

Class of Spleen	AGE GROUP				
	0 - 1	2 - 4	5 - 9	10 - 14	Adults
0	13	-	-	-	118
1	5	6	6	12	60
2	6	11	45	16	20
3	14	39	32	6	5
4	13	18	1	-	-
5	1	1	-	-	-

Spleen Rate 2 - 9 years = 100% Adult = 41.8%

Females N = 562

Class of Spleen	AGE GROUP				
	0 - 1	2 - 4	5 - 9	10 - 14	Adults
0	6	1	1	1	95
1	5	1	10	4	109
2	4	18	27	13	134
3	7	48	21	3	20
4	10	15	4	1	2
5	-	1	-	-	1

Spleen Rate 2 - 9 years = 98.6% Adult = 73.6%



SPLENOMEGALY.

Spleen Rate  
%

Name of Place	Age Group 2 - 9			Adults 15+		
	Males	Females	Total	Males	Females	Total
Masimera	100	93.5	96.8	12.7	43.3	31
Kamasundu	100	100	100	51	77	67
Mawulay- Mamanso	100	100	100	59	80	70
Foradugu	100	100	100	54	90	80.5
Combined villages	100	98.6	99.3	41.8	73.6	62
Lunsar	97	91	93.9	18.1	53.6	55.7

From a perusal of the rates in the area studied it would seem that the type of malarial endemicity lies between hyperendemic and holoendemic, since the adult tolerance is clearly intermediate.

Spleen rates 2 - 9 years, were 100% for males and 98.6% for females. For adults the rate was 41.8% for males and 73.6% for females.

Acanthocheilonema perstans

This was seen in 1.3% of the total population.

*Acanthocheilonema streptocerca* was recognised in one male, aged 18 years from Kamasundu.

Onchocerciasis

The total population was examined clinically for nodules but skin snips were taken from 72.8% of males and

COMBINED VILLAGES

Table 92

Frequency of site of Onchocercomata

Site	Males	Females	Total	%
Sacrum	77	88	165	21.8
Great trochanters	113	219	332	43.9
Iliac Crests	87	153	240	31.7
Thorax	5	2	7	0.9
Legs	4	2	6	0.8
Groin	6	-	6	0.8
	292	464	756	

COMBINED VILLAGES

Table 93

Number of Onchocercomata per Person

Number of Onchocercomata	Males	Females	Total	%
1	45	78	123	27.1
2	30	53	83	18.3
3	21	36	57	12.6
4	13	30	43	9.5
5	13	19	32	7.0
6	8	12	20	4.4
7	8	8	16	3.5
8	8	8	16	3.5
9	2	3	5	1.1
10 plus	25	34	59	13.0
	173	281	454	

79.2% of females only.

40.8% of all males and 52.0% of all females had onchocerciasis, on the basis of being positive on skin biopsy and, or having onchocercomata demonstrable. In males, the skin snip positive rates for one skin snip were higher than the corresponding rate for nodules. In females, this correspondence occurred in Masimera and Mawulay-Mamanso but was inverted in the other two villages. The rate for onchodermatitis was seen to be 22.4% for males and 12.7% for females, this is an inversion of what would be expected, the onchodermatitis rate would tend to follow the rate for the disease.

The great trochanter region is the site of election for nodules, followed by the iliac crests and sacral region. 27.1% of persons had only one nodule, 18.3% had 2 and 13% had 10 or more nodules.

Taking the rate for onchocerciasis for males and females for each village we find that the villages that are affected most severely are nearest to the Rokel River.

Mawulay-Mamanso, Masimera, Foradugu, Kamasundu are affected in that order. Mawulay-Mamanso having the highest rate and Kamasundu the lowest.

The number of nodules per person also indicates intensity of infection and the proportion of persons with

Table 94

Clinical data, village totals

Males - all ages

Males

	Persons	Parasitaemia				Onchocerciasis					Dentition				Eyes			Hair		Lips			Tongue				Bones				Nutrition		Illness		Ulcers		Scars		Herniae		Skin			
		Blood film taken	P. falciparum present	Gametoocytes present	A. perstans	Skin snip taken	mf. O. volvulus present	Nodules positive	Oncho positive	Onchodermatitis positive	Caries	Missing	D.M.F.	Gingivitis	Opacities in eyes	Abnormal	Blind	Hypochromotrichia	Normal	Cheilosis	Angular stomatitis	Normal	Glossitis	Fissured	Geographical	Normal	Bossed skull	Beaded ribs	Bow legs	Nutritional deficiency present	V.D. present or past	Complaints of illness	Ulcers present	Vaccination	Other	Umbilical	Other	Lichenified	Depigmented	Loss elasticity	Xerosis			
Masimera	111	108	97	6	2	78	50	48	57	12	60	33	61	44	51	6	1	2	77	10	29	98	1	12	-	108	2	1	1	37	27	73	4	74	53	55	2	21	13	6	3			
%		89.8	6.2	1.9		70.3	64.1	43.2	51.4	21.1	54.1	29.7	55.0	39.6	45.9	5.4	0.9	1.8	68.4	9.0	26.1	88.3	0.9	10.8	-	97.3	1.8	0.9	0.9	33.3	24.3	65.8	3.6	66.7	47.7	49.5	1.8	18.9	11.7	5.4	2.7			
Kamasundu	171	171	162	24	4	125	48	57	62	7	86	37	87	85	86	17	-	3	42	109	93	128	24	19	-	170	1	1	-	133	34	133	12	86	76	108	5	99	3	-	-			
%		94.7	14.6	2.3		73.7	38.1	33.3	36.3	11.3	50.3	21.6	50.9	49.7	50.3	9.9	-	1.8	24.6	63.7	54.4	74.9	14.0	11.1	-	99.4	0.6	0.6	-	77.8	19.8	77.8	7.0	50.3	44.4	63.2	2.9	57.9	1.8	-	-			
Mawulay-Mamanso	55	55	53	12	2	43	31	32	33	14	20	11	20	20	30	6	-	-	15	32	35	44	3	8	1	54	-	1	-	40	11	38	-	35	24	28	-	38	5	-	1			
%		96.4	22.6	3.6		78.2	72.1	58.2	60.0	42.4	36.4	20.0	36.4	36.4	54.5	10.9	-	-	27.3	58.2	63.6	80.0	5.5	14.8	1.8	98.2	-	1.8	-	72.7	20.0	69.1	-	63.6	43.6	50.9	-	69.1	9.1	-	1.8			
Foradugu	111	111	108	21	-	79	26	32	31	8	42	19	42	31	38	10	2	1	24	78	74	94	9	10	1	111	-	-	-	88	17	63	16	67	60	75	1	68	2	-	-			
%		97.3	19.4	-		71.2	32.9	28.8	27.9	25.8	37.8	17.1	37.8	27.9	34.2	9.0	1.8	0.9	21.6	70.3	66.7	84.7	8.1	9.0	0.9	100.0	-	-	-	79.3	15.3	56.8	14.4	60.4	54.1	67.6	0.9	61.3	1.8	-	-			
Total	448	445	420	63	8	326	155	169	183	41	208	100	210	180	205	39	3	6	158	229	231	364	37	49	2	443	3	3	1	298	89	307	32	262	213	266	8	226	23	6	4			
%		94.4	15.0	1.8		72.8	47.5	37.7	40.8	22.4	46.4	22.3	46.9	40.2	45.8	8.7	0.7	1.3	35.3	51.1	51.6	81.3	8.3	10.9	0.4	98.9	0.7	0.7	0.2	66.5	19.8	68.5	7.1	58.5	47.5	59.4	1.8	50.4	5.1	1.3	0.9			

Table 95 -

Clinical data, village totals

Females - all ages

Females

	Parasitaemia				Onchocerciasis					Dentition				Eyes			Hair	Lips			Tongue			Bones			Nutrition	Illness	Ulcers		Scars		Herniae		Skin						
	Persons	Blood film taken	P. falciparum present	Gametocytes present	A. perstans	Skin snip taken	mf. O. volvulus present	Nodules positive	Oncho positive	Onchodermatitis positive	Caries	Missing	D.M.F.	Gingivitis	Opacities in eyes	Abnormal	Blind	Hypochromotrichia	Normal	Cheilosis	Angular stomatitis	Normal	Glossitis	Fissured	Geographical	Normal	Bossed skull	Beaded ribs	Bow legs	Nutritional deficiency present	V.D. present or past	Complains of illness	Ulcers present	Vaccination	Other	Umbilical	Other	Lichenified	Depigmented	Loss elasticity	Xerosis
Masimera	128	127	113	5	2	106	61	69	76	7	76	45	78	58	77	11	1	22	78	8	43	96	6	26	1	128	-	-	-	69		108	6	83	70	75	-	16	4	7	-
%		89.0	4.4	1.6		82.8	57.5	53.9	59.4	9.1	59.4	35.2	60.9	45.3	60.2	8.6	0.8	17.2	60.9	6.3	33.6	75.0	4.7	20.3	0.9	100.0	-	-	-	53.9		84.4	4.7	6.5	54.7	58.6	-	12.5	3.8	5.5	-
Kamasundu	193	192	173	20	1	153	35	73	78	4	110	73	112	84	131	29	3	39	34	140	113	138	28	23	6	192	-	-	1	164	173	173	115	131	97	98	-	106	7	1	2
%		90.1	11.6	0.5		79.3	22.9	37.8	40.4	5.1	57.0	37.8	58.0	43.5	67.9	15.0	1.6	20.2	17.6	72.5	58.5	71.5	14.5	11.9	3.1	99.5	-	-	0.5	85.0		89.6	2.6	57.5	50.3	50.8	-	54.9	3.6	0.5	1.0
Mawulay- Mamanso	74	74	71	7	-	61	44	50	52	17	47	30	48	30	42	13	4	18	7	56	63	56	6	13	-	73	1	-	-	72		57	4	49	37	44	-	58	7	3	1
%		95.9	9.9	-		82.4	72.1	67.6	70.3	32.7	63.5	40.5	64.9	40.5	56.8	17.6	5.4	24.3	9.5	75.7	85.1	75.7	8.1	17.6	-	98.6	1.4	-	-	87.3		77.0	5.4	66.2	50.0	50.5	-	78.4	9.5	4.1	1.4
Foradugu	167	165	161	25	2	125	43	84	86	9	84	56	86	76	103	33	1	32	19	132	126	128	19	19	2	167	-	-	-	152		119	10	104	102	73	-	94	3	1	1
%		97.6	15.5	1.2		74.9	34.4	50.3	51.5	10.5	50.3	33.5	51.5	45.5	61.7	19.8	0.6	19.2	11.4	79.0	75.4	76.6	11.4	11.4	1.2	100.0	-	-	-	91.0		71.3	6.0	62.3	61.1	43.7	-	56.3	1.8	0.6	0.6
Total	562	558	518	57	5	445	183	276	292	37	317	204	324	248	353	86	9	111	138	336	345	418	59	81	9	560	1	-	1	457		457	25	347	306	290	-	274	21	12	4
%		92.8	11.0	0.9		79.2	41.1	49.1	52.0	12.7	56.4	36.3	57.7	44.8	62.8	15.3	1.6	19.8	24.6	59.8	61.4	74.4	10.5	14.4	1.6	99.6	0.2	-	0.2	81.3		81.3	4.4	61.7	54.4	51.6	-	48.8	3.7	2.1	0.7

Table 96

Clinical data, village totals

Total - all ages

Total

	Persons	Parasitaemia				Onchocerciasis					Dentition				Eyes			Hair		Lips			Tongue				Bones				Nutrition			Illness		Ulcers		Scars		Herniae		Skin			
		Blood film taken	P. falciparum present	Gametocytes present	A. perstans	Skin snip taken	mf. O. volvulus present	Nodules positive	Oncho positive	Onchodermatitis positive	Caries	Missing	D.M.F.	Gingivitis	Opacities in eyes	Abnormal	Blind	Hypochromotrichia	Normal	Cheilosis	Angular stomatitis	Normal	Glossitis	Fissured	Geographical	Normal	Bossed skull	Beaded ribs	Bow legs	Nutritional deficiency present	V.D. present or past	Complains of illness	Ulcers present	Vaccination	Other	Umbilical	Other	Lichenified	Depigmented	Loss elasticity	Xerosis				
Mastimera	239	235	210	11	4	184	111	117	133	19	136	78	139	102	128	17	2	24	155	18	72	194	7	38	1	236	2	1	1	106	27	181	10	157	123	130	2	37	17	13	3				
%		89.4	5.2	1.7		77.0	60.3	49.0	55.6	14.3	56.9	32.6	58.2	42.7	53.6	7.1	0.8	10.0	64.9	7.5	30.1	81.2	2.9	15.9	0.4	98.7	0.8	0.4	0.4	44.4	24.3	75.7	4.2	65.7	51.5	54.4	0.8	15.5	7.1	5.4	1.3				
Kamasundu	364	363	335	44	5	379	83	130	140	11	196	110	199	169	217	46	3	42	76	249	206	263	52	42	6	362	1	1	1	297	34	306	17	197	173	206	5	205	10	1	2				
%		92.0	13.1	1.4		76.6	29.7	35.7	38.5	7.9	53.8	30.2	54.7	46.4	59.6	12.6	0.8	11.5	20.9	68.4	56.6	73.1	14.3	11.5	1.6	99.5	0.3	0.3	0.3	81.6	19.8	84.1	4.7	54.1	47.5	56.6	1.4	56.3	2.7	0.3	0.5				
Mamano	129	129	124	19	2	104	75	82	85	31	67	41	68	50	72	19	4	18	22	88	98	100	9	21	1	127	1	1	-	112	11	95	4	84	61	72	-	96	12	3	2				
%		96.1	15.3	1.6		80.6	72.1	63.6	65.9	36.5	51.9	31.8	52.7	38.8	55.8	14.7	3.1	14.0	17.1	68.2	76.0	77.5	7.0	16.3	0.8	98.4	0.8	0.8	-	86.8	20.0	73.6	3.1	65.1	47.3	55.8	-	74.4	9.3	2.3	1.6				
Foradugu	278	276	269	46	2	204	69	116	117	17	126	75	128	107	141	43	3	33	43	210	200	222	28	29	3	278	-	-	-	240	17	182	26	171	162	148	1	162	5	1	1				
%		97.5	17.1	0.7		73.4	33.8	41.7	42.1	14.5	45.3	27.0	46.0	38.5	50.7	15.5	1.1	11.9	15.5	75.5	71.9	79.9	10.1	10.4	1.1	100.0	-	-	-	86.3	15.3	65.5	9.4	61.5	58.3	53.2	0.4	58.3	1.8	0.4	0.4				
Total	1010	1003	938	120	13	771	338	445	475	78	525	304	534	428	558	125	12	117	296	565	576	782	96	130	11	1003	4	3	2	755	89*	764	57	609	519	556	8	500	44	18	8				
%		93.5	12.8	1.3		76.3	43.8	44.1	47.0	16.4	52.0	30.1	52.9	42.4	55.2	12.4	1.2	11.6	29.3	55.9	57.0	77.4	9.5	12.9	1.1	99.3	0.4	0.3	0.2	74.8	19.8	75.6	5.6	60.3	51.4	55.0	0.8	49.5	4.4	1.8	0.8				

15+

564

\* males only

10 nodules or more reflects this clearly.

In Mawulay-Mamanso 40.7% of persons with nodules have 10 or more, in Masimera 14.2% of Foradugu 6.0% and in Kamasundu 1.5%.

The rates for onchodermatitis were similar with Mawulay-Mamanso (36.5%) with the highest rate and Kamasundu (7.9%) the lowest. The rates for Masimera and Foradugu were 14.3% and 14.5% respectively.

Of the conditions associated with onchocerciasis, there were 8 cases of hydrocoele, one case of elephantiasis of the leg, and four cases of elephantiasis of scrotum, all in males.

#### 12.4. Dentition

The Decayed-Missing-Filled and gingivitis rates are high and regular for all four villages. Teeth are frequently encrusted with tartar so much so that teeth are seen to be fused by it into one mass.

Brushing with a chewing stick or with brushes does occur.

Males have a D.M.F. rate of 46.9% compared with 57.7% for females. The gingivitis rate is 40.2% for males and 44.1% for females.

#### Eyes

3 males (0.7%) and 9 females (1.6%) were blind. Of these, one male and three females were blind in one eye only. This gives a general rate of 1.2% for both sexes.

Blindness (all cases) is at a higher rate in Mawulay-Mamanso which is the village most infected with onchocerciasis.

It is probably that 10 out of the 12 cases of blindness were due to onchocerciasis.

Uniform opacities were noted for 45.8% of males and 62.8% of females.

#### Hypochromotrichia

1.3% of males and 19.8% of females exhibited this sign. There was little variability between the four villages.

#### Nutritional Deficiency

For the purposes of this survey the criteria of nutritional status have been set out in section 7.3. It will be seen from the tables that the most prosperous village Masimera, has the lowest rate for nutritional defect, but the rates are nevertheless high.

Kwashiorkor was seen in its classical form only once (females age 2 at Kamasundu, Ni.12). One male aged 3, and two female infants were marasmic. All cases seen at Kamasundu except for onemarasmic female at Masimera.

This is in keeping with the observation of Brock and Autret (1952) that kwashiorkor is more often associated with the cassava and maize type of cultivation than with rice and yams.

Hypo-riboflavinosis, manifested by changes in the lips



was very common. Walters 1958, found it almost universal at Ilobi, Nigeria. Hair changes are rarer and bony deformities rare.

66.5% of males and 81.3% of females were suffering from or had suffered from a nutritional deficiency.

#### Ulcers

7.1% of males and 4.4% of females were suffering from ulcers.

#### Vaccination

The Government team visits the villages from time to time. In Kamasundu, the Chief Pa Alimamy Kamara, insists that everyone has it done. He fines those who refuse. 58.5% of males and 61.7% of females had been vaccinated.

#### Venereal Disease

19.8% of all males were suffering from or had suffered from one or more attacks of urethral discharge. 9 cases of active disease were seen (2% of males).

This was investigated in males only, and gonorrhoea was the condition enquired into. The rate in males of 15 years and over is 43.8% for present and past attacks of the disease. This confirms the impression gained that gonorrhoea is a very common condition, and its effects on the female generative apparatus, joint and eye involvement make it an important disease in Sierra Leone. Calculation from the figures given by Blacklock (1930)

gives a rate of 41.4% for the gonorrhoea present or recent attacks, in the Northern Province. His sample was 732 males over 14 years old.

#### Umbilical Herniae

This was seen in 59.4% of males and 51.6% of females. As in Lunsar, prevalence decreases with age. This condition is common in Africans in all parts of the world, and is present in the large majority at birth (Trowell, 1960).

#### Other Conditions seen in Villages

These are set out in table 97. Some points are worthy of note.

Speech Defects. 4 persons (3 male, 1 female) were stammerers and 2 (1 male, 1 female) had other speech defects.

Mentally Defective. There was only one female, aged 30, who was mentally defective. This supports the story given that mentally defective children are destroyed at an early age.

Epilepsy. There were two persons, both males, with classical histories of epilepsy. This is not a rare condition in Africans (Trowell, 1960).

Goitre. Three cases of benign enlargements of the thyroid, all females (ages 50, 52, 60).

Yaws. Clearance of this disease is impressive. Old scars were not infrequently seen but active cases were seen on only two occasions. The UNICEF/WHO Team visited

Table 97

Other Conditions seen in Combined Villages

	Males	Females	Total
Ainham	1	-	1
Congenital heart	2	-	2
Deafness	2	2	4
Dental Abscess	2	3	5
Diarrhoea	15	13	28
Dupuytren's contracture	1	1	2
Dysentery	3	2	5
Elephantiasis leg	1	-	1
Elephantiasis scrotum	4	-	4
Epidemophytosis	4	4	8
Epilepsy	2	-	2
Goitre	-	3	3
Hemiplegia	1	1	2
Hydrocele	8	-	8
Injury	16	13	29
Leprosy	2	1	3
Marasmus	1	2	3
Measles	26	34	60
Measles broncho-pneumonia	13	17	30
Measles otitis-media	4	2	6
Mentally Defective	-	1	1
Pertussis	-	1	1
Pneumonia	-	1	1
Poliomyelitis, paralysis	1	-	1
Post encephalitic state	1	-	1
Sarcoma jaw	-	1	1
Scabies	38	24	62
Sepsis	21	23	44
Speech Defect	4	2	6
Stomatitis	1	-	1
Talipes equimo-varus	-	1	1
Tuberculosis	2	1	3
Worms	74	58	132
	250	211	461

Sierra Leone in 1958. The rates given by Blacklock (1930) for this disease were high.

Leprosy. Few cases of this disease were seen, Blacklock (1929) estimated the incidence in Northern Province at 6% and in the Central and Southern areas as 1.3%.

More recently Ross (1958) estimated the incidence in the Port Loko District of the Northern Province at from 1.9% to 11.4%.

#### 12.3.2. Physiological Data, Combined Villages

The mean haemoglobin for males is 52.6% and for females 53.1%. This gives mean levels of 7.3 gms per 100 ml for males and females for the combined villages. Table 97a.

#### 12.3.3. Fertility and Survival

Fertility and Survival and the Ages at which children died in the combined villages are set out in Table 98 and 99.

##### Fertility

There were 61 live births, 41 males and 20 females, in the year under review in a population of 1010 (448 males, 562 females).

The Crude Birth Rate is 60.4 per 1000.

##### Fertility Rate

There were 273 females in the reproductive age groups 15 - 49. In the year under review there were 61 live births a General Fertility Rate of 223.5 per 1000.

Table 97a

Mean Haemoglobin levels in villages and Lunsar  
(Tallqvist 100% = 13.8 gms/100 ml).

		Hb%	Hb.gms/100 ml.
MASIMERA	Males	57.3	7.9
	Females	56.0	7.7
	Total	56.6	7.8
KAMASUNDU	Males	52.4	7.2
	Females	54.1	7.5
	Total	53.3	7.4
MAWULAY- MAMANSO	Males	52.7	7.3
	Females	53.4	7.4
	Total	53.1	7.3
FORADUGU	Males	48.8	6.7
	Females	49.5	6.8
	Total	49.2	6.8
COMBINED VILLAGES	Males	52.6	7.3
	Females	53.1	7.3
	Total	52.8	7.3
LUNSAR	Males	58.2	8.1
	Females	56.0	7.8
	Total	56.8	7.9

TABLE 98

FEMALES.

FERTILITY and SURVIVAL, COMBINED VILLAGES.

Age	N	1 Live Births			2 Stillbirths			3 Live Births in Last Year			Stillbirths in Last Year			Live Births dying within Year			Multiple Pregnancies	Abortions.	Children Dying			Non- Fertile Married Females	One Preg- nancy Only.
		M	F	T	M	F	T	M	F	T	M	F	T	M	F	T							
15 - 19	24	4	3	7	-	1	1	4	-	4	-	-	-	-	-	-	1	-	2	2	10	7	
20 - 24	55	56	45	101	11	4	15	14	3	17	-	-	-	2	-	2	( 1 Still MM)	10	18	15	33	7	14
25 - 29	59	102	114	216	8	8	16	8	13	21	-	-	-	2	2	4	4 Twins 3 MF, 1 MM) ( 1 Still MF)	21	55	53	108	3	2
30 - 34	43	79	89	168	10	16	26	13	1	14	1	1	2	-	-	-	3 Twins FF,MM,MF ( 1 Still MF)	18	33	35	68	3	2
35 - 39	26	60	62	122	13	2	15	-	3	3	2	-	2	-	-	-	3 Twins 2 MF, FF	4	25	36	61	2	2
40 - 44	28	79	98	177	7	10	17	-	-	-	-	-	-	-	-	-	5 Twins 3 FF,2MF ( 3 Still 2 FF, MM )	20	42	52	94	1	1
45 - 49	38	110	85	195	17	12	29	2	-	2	-	-	-	-	-	-	1 Twins MM 1 Triplets MMM (2 Still MF FF)	23	57	43	100	1	4
50 - 54	16	41	43	84	1	1	2	-	-	-	-	-	-	-	-	-	2 Twins MM, FF	7	24	22	46	1	1
55 - 59	26	91	76	167	10	12	22	-	-	-	-	-	-	-	-	-	5 Twins 3 FF,MF,MM ( 2 Still,MM MF)	14	46	47	93	-	-
60 - 64	20	65	59	124	8	4	12	-	-	-	-	-	-	-	-	-	5 Twins 4 FF,MM ( 2 Still MM)	10	39	27	66	-	1
65 - 69	8	22	17	39	-	3	3	-	-	-	-	-	-	-	-	-	-	2	17	5	22	-	1
70 - 74	10	26	26	52	9	2	11	-	-	-	-	-	-	-	-	-	1 Twins MM ( 1 Still MM)	5	14	14	28	-	-
75+	8	24	19	43	3	1	4	-	-	-	-	-	-	-	-	-	1 Twins MM ( 1 Still MM)	4	15	13	28	1	-
TOTAL	361	759	736	1495	97	76	173	41	20	61	3	1	4	4	2	6	30 Twins 1 Triplets (13 Still )	139	385	364	749	29	35

TABLE 99

## AGES AT WHICH CHILDREN DIED, COMBINED VILLAGES

## FEMALES

AGE GROUP OF MOTHER	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 - 59	60 - 64	65 - 69	70 - 74	75+	TOTAL	
N	24	55	59	43	26	28	38	16	26	20	8	10	8	361	
AGE AT DEATH	NUMBERS OF CHILDREN DYING													TOTAL	%
0 - 1m	-	10	16	9	7	13	14	3	9	10	3	-	-	94	12.5
2m - 12m	-	10	38	27	20	30	32	13	39	24	3	5	10	251	33.5
Under 1	-	20	54	36	27	43	46	16	48	34	6	5	10	345	46.0
1 -- 4	2	12	45	26	25	31	39	19	28	17	8	2	6	260	34.7
5 -- 9	-	1	9	3	6	14	8	4	11	5	1	2	3	67	8.9
10 -- 14	-	-	-	3	3	4	3	2	1	3	1	5	-	25	3.3
15 -- 19	-	-	-	-	-	2	3	5	5	2	5	5	4	31	4.1
20+	-	-	-	-	-	-	1	-	-	5	1	9	5	21	2.8
TOTAL	2	33	108	68	61	94	100	46	93	66	22	28	28	749	99.8

223 females aged 30 years and over gave birth to 1171 live births. The mean number of children born alive to each female in these age groups is therefore 5.2.

Of the 273 females in the reproductive age groups 5 were single (1.8%), 13 were widowed, 3 divorced and 2 separated.

Of the 268 females in the reproductive period who were married or had been married 29 (10.8%) had never been pregnant.

#### Family Size

From the distribution of ever-married women, by number of children born alive (Table 99a) for women of 30 and over, the commonest number born alive was 1, followed by 4, 8, 5, 6 and 7.

For women of completed fertility the distribution of numbers of children born alive tends to be high.

The average number of children born alive to married females of completed fertility was 5.6.

#### Sterility

Taking the definition of Sterility as being married 7 years without a pregnancy there were 11 sterile females (4.1%).

It is debatable whether the definition of sterility is valid in a society where polygyny is so common.

35 females (12.8%) had one pregnancy only. The youngest married female was aged 12.



COMBINED VILLAGES

Table 99A

Distribution of Ever-married women by Number of Children Born Alive

Present Age of Woman	Number of women with the following number of children born alive												Total number of women	
	0	1	2	3	4	5	6	7	8	9	10	11		12
15 - 29	26	29	18	20	20	12	3	4	-	-	-	-	1	133
30 - 44	6	12	7	8	13	9	12	11	9	6	3	-	1	97
45 and over	5	15	9	5	13	15	11	12	16	7	10	3	4	125
TOTAL	37	56	34	33	46	36	26	27	25	13	13	3	6	355

2.4

1.1

5.7

Multiple Pregnancy Rate.

There were 30 sets live twins, 1 set live triplets.

Out of 1,495 live births there were 31 multiple pregnancies, a Multiple Pregnancy Rate of 20 per 1,000.

10 sets of twins were males and females.

7 sets of twins were males.

13 sets of twins were females.

The triplets were all males.

Sex Ratio at Birth.

Using total live births, the Sex Ratio at birth is 103 males per 100 live females.

Survival

In the absence of any registration of deaths, it was not possible to ascertain death rates.

From table 99 the proportional rates for the children who died were 12.5% under 1 month and 46.0% under 1 year. Infant deaths - Toddler deaths ratio is 1.3. At the time of the survey and with reference to all obstetric histories 50.7% of male and 49.4% of female children born alive to women in the villages, had died.

Infant Mortality Rate

6 out of the 61 children born in the year under review, died during the year.

The Infant Mortality Rate is 98.3 per 1000

Basing the calculation on all the females in the villages, using the total number of live births 1495, and the number who died under 1 year of age, 345. The mortality rate for these infants is 230.7 per 1000. All the females in the sample gave birth to 759 males and 736 females. 49.9% of these were surviving at the time of the enquiry. 49.1% males and 50.5% females.

#### Stillbirth Rate

There were 4 stillbirths during the last year, among 65 live and stillbirths, a rate of 61.5 per 1000.

There were 173 stillbirths recorded out of 1668 live and stillbirths among the women from the villages, a proportion of 103.6 per 1000, births live and still.

#### Abortions

356 females in the villages who were married or had been married had 139 abortions, a rate of .39 per female. There were 76.9 abortions per 1000 pregnancies.

#### Commentary

The four villages studied resemble each other with regard to civil data, but differ with regard to the prevalence of some conditions, notably nutritional deficiency and onchocerciasis.

12. Demographic of Income and Settled Villages

12.1. Income Data

Population Percentage

The population of income is more spread out than in the past of view of the distribution. - Below more or less of the Duxer group there are only 14.7% of the population village population.

Most of the income population is under 14 years old. 11.5% under 2 years old as against 11.7% and 11.8% for the settled villages in the same two decades. - In 1927 80% of the income population was under 14 years old. - In 1927 the population of the income population was 11.5% of the population of the village population.

**PART III.**

In the 1927-1931 period the income population was 11.5% of the population of the village population. - In 1927 the population of the income population was 11.5% of the population of the village population.

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### 13. Comparison of Lunsar and Combined Villages

#### 13. 1. Census Data

##### Population Structure

The population of Lunsar is more evenly balanced from the point of view of sex distribution. Males make up 49.0% of the Lunsar population but only 44.3% of the combined village population.

36% of the Lunsar population is under 15 years, and 13.3% under 5 years old as against 44.2% and 24.1% for the combined villages in the same age groups. In a 1959 Census in the Solomon Islands, 44% of the population was under the age of 15. In Great Britain in 1851, 35.5% of the population was under 15 years old compared with 21.5% in 1947.

In the age groups 20 - 39 there were 188 males and 184 females compared with 93 males and 183 females in the villages. 93 males represent only 33.6% of the total of both sexes for these age groups.

In the 5 - 14 age groups there are even numbers, 114 males and 100 females in Lunsar. A similar figure occurs in the villages if the Bundu girls are included in the census material, namely 188 males and 133 females. In Lunsar 6.8% are 50 years and over compared with 13.4% in the villages.

In both Lunsar and the villages the population under 20

is greater than that between 20 and 40. It follows that, if stability is maintained, the populations will tend to increase.

Thus Lunsar has a population in which males are well represented especially in the working age groups. The villages have, on the other hand, a depletion of young males. Infants and children are proportionately better represented in the villages.

If there is an excess of males at all ages, it can be presumed that conditions are favourable for the marriage (however that might be defined) of as many of the eligible females as wish to marry. From this point of view conditions are more favourable for marriage in Lunsar than in the villages.

Migration meaning movement of persons within the country for varying periods of time is a feature of life in Sierra Leone.

The Chiefs at the four villages were questioned regarding the mobility of the villagers.

The question and replies are as follows:-

1. Is there any daily commuting with the Sierra Leone Development Company Mines at Marampa? None. It costs 2/-d from Masimera and 4/-d from Kamasundu to go to Lunsar by lorry. There are no fixed times of departure.
2. Have any persons left the village to work for the mines?

Persons have left all the villages to go and work for the mines. These persons have taken up residence in Lunsar.

3. Do persons leave the village during the slack farming season to take up temporary work elsewhere? Persons do leave the villages to take temporary work with the S.L.D.C. or the Diamond Mines during the slack farming season.

This was denied by Chief Bai Yola at Masimera but all other Chiefs agreed that this occurred in their villages. It should be noted that the peak labour force at the S.L.D.C. mines occurs in August (2979). On the other hand December (2076), January (2073) and February (2160) are the months in which the smallest labour force is employed. The figures given are for 1960. Thus the slack time on the farms coincides with the minimum labour force at the mines. (See Table 3).

4. Have persons left the villages recently? Some persons have left recently for new jobs from Kamasundu, Mawulay-Mamanso and Foradugu. Some of these persons will remit money to the villages. Some will return at the beginning of the rains, others will stay away a considerable period and leave the women to do the farming.

From the foregoing it will be noted that persons in the working age groups have left the villages to get work and, in some cases, to stay in Lunsar.

That this had happened recently, during the dry season, would make it appear that the traditional movements

and visits between the villages at this time of the year, had evolved into visits to Lunsar to savour town life and earn some money at the same time. It should be noted that 28.8% of both sexes were born in Lunsar, compared with 71.1% of both sexes born in their village of domicile.

#### Civil State

40% of all males in Lunsar, and 34.6% of all males in the villages were married. However, taking the age groups 20 - 35, only 51% of these in Lunsar were married compared with 75.0% in the villages. Thus about half the males in these age groups were unmarried in Lunsar.

93% of females in Lunsar and all females in the villages in these age groups were married.

The youngest married females were aged 9, 10 and 14 in Lunsar and aged 12 and 14 in the villages of Mawulay-Mamanso and Masimera. Female children may become married at an early age but they do not cohabit with their husband until they are about 15 or 16 years old.

Taking the age group 45 - 54 it is found that 97.3% of males in the villages and 92.3% of males in Lunsar had been married, and all females in these age groups had been married. Thus there is a consistently high marriage rate at ages before persons become too old to have children, and also high marriage rates, especially for females in all age groups over 15.



The comparative figures for England and Wales are remarkably constant from 1871 onwards being about 90% for males and about 85% for females. The population of Scotland marries less and later than that of England and Wales.

#### Polygyny

In Lunsar 21% of marriages were polygynous and 49.1% in the villages. The trend to monogamy is thus strongly marked in Lunsar. No male in the Lunsar sample had more than 5 wives, but 4 males in the villages had more than 5.

#### Tribe

76.2% of Lunsar's population are Temne compared with 93.8% of the population of the villages. This is to be expected in a town created by industry. "Foreigners" from other part of Sierra Leone and West Africa and Syrians from overseas are drawn to the town to supply skills and trade.

#### Birthplace

30.3% of males and 27.3% of females were born in Lunsar. The figures for the villages are 79.9% males and 64.1% of females. It will be noted that in both cases, more males are born in the place they live in than females. There is thus a tendency for females to be brought into the villages from outside.

The villages have evidently a more stable population

than Lunsar, 70% of Lunsar's population having been born outside the town.

### Residence

Data about duration of residence were collected for Lunsar and the village of Foradugu only. These patterns are similar. 23.4% of both sexes in Lunsar and 24.8% of both sexes in Foradugu had lived in their respective places less than 2 years.

31.2% of both sexes in Lunsar and 36.3% of both sexes in Foradugu had been in these places 10 years or more.

Foradugu resembles Lunsar in that it contains many shops and bars and has good communications.

### Languages and Literacy

89.2% of the population of Lunsar speak Temne and 21.6% of males and 5.1% of females are literate in English.

In the villages all speak Temne and only 0.9% of both sexes are literate in English.

Any literates in the villages are confined to those villages where mission schools exist.

For the Arabic language 26.3% of males and 7.6% of females in Lunsar stated that they were literate in this language. In the villages 0.9% of males and 0.2% of females made the same claim.

### Religion

78.6% of males and 82.9% of females in Lunsar were

Muslim. This compared with 95.1% of males and 91.5% of females in the villages. 11.3% of Lunsar's population are Christians, compared with 1.4% in the villages.

#### Education

27.8% of males and 8.2% of females in Lunsar were attending or had attended schools giving a general education.

There is great variability in this factor in the different villages. Foradugu has 23.4% of males and 6.0% of females who are at school or who have been to school, whereas Mawulay-Mamanso has none.

For the Koranic schools which give only religious teaching, 20.9% of males and 5.6% of females in Lunsar attend or had attended.

In the villages 23.9% of males and 4.3% of females had this teaching.

#### Occupation

Many persons in both town and villages had more than one occupation.

'House' In the village 2.2% of males and 56.6% of females gave this as their occupation compared with 1.0% and 40.1% in the town.

'Farmer' As would be expected, farming is the most frequent occupation in the villages. There is a great contrast in rates in this category. 13.6% of males and

5.8% of females in Lunsar, and 60.0% of males and 64.2% of females in the villages.

'Trader' 7.2% of males and 40.3% of females in Lunsar were traders compared with 2.5% and 13.0% in the villages. Almost all of the villages total is made up by Foradugu. 'Trader' and 'House' are the commonest female occupations in Lunsar.

'Industry' It will have been noted that the term 'Industry' has been used in different senses for the town and the villages. In Lunsar, it refers to employment with the Sierra Leone Development Company, an organisation which has no counterpart in the villages.

25.6% of the males of Lunsar and no females are employed in this industry in one category or other. This is the commonest male occupation in Lunsar.

In the villages, the term refers to the handicrafts listed in section 12.1. In the town these handicrafts come under section 6.2.10. listed as 'Other' occupations.

22.2% of males and 13.2% of females in Lunsar have occupations in this list. In the villages 5.1% of males and 3.0% of females are engaged in this way.

'Government' In Lunsar 1.9% of males and no females are employed by the Government. In the villages 2.6% of males are employed by the Government. There is one

female Government employee, a midwife.

'None' Only one adult person, a female aged 75 years, gave 'none' as her occupation in a village.

18.3% of males and 22.6% of females of all ages stated this to be their occupation in Lunsar. This works out at 2.5% of males and 3.9% of females of 15 years and over.

'Unemployed' This term has to be used with caution and an explanation has already been given. Bearing in mind these reservations there are 7.8% of males and 1.6% of females unemployed in Lunsar. (See Page 103)

There are none in this category in the villages.

### 13.2. Housing

#### House types

There are only 5 houses (0.8%) in Lunsar of the traditional Temne round style, compared with 37% of village houses. (See Table 87).

The villages differ considerably among themselves only 8.5% of houses are round in Foradugu compared with 69% in Kamasundu at the other end of the scale.

The rate for thatch roofs drops from 75% at Mawulay-Mamanso to 55.3% at Foradugu. Thus it will be seen that the corrugated iron roof is present in Foradugu at a rate of 44.7% compared with only about 30% in the other villages.

Taking the general rate for corrugated iron roofs,

Lunsar has 53.3% and the villages, 35.5%.

Corrugated iron roofs are more durable than thatch, and more expensive and rapid to construct. The weather-proof qualities do not differ much and the thatch roof makes the house cooler and quieter. The noise under a pan roof in a tropical storm is so great that it is impossible to converse. Pan roofs house less vermin than thatch but bats seem equally at home in either.

It is quite possible that a corrugated iron roof is a status symbol because it seems that the change to corrugated iron is one of the first things a person does when he acquire money.

#### Number of Rooms per House

As has been stated previously this refers to any room, including the parlour, which may be used for sleeping, and excludes, kitchen, toilet or storeroom.

Some houses have a room, generally next to the latrine, and always in a separate building, where washing may be performed. Toilet refers both to the room containing the latrine and to the washroom, if any.

The number of rooms per house is higher in Lunsar, at a mean of 8 per house than it is in the villages, with a mean of 5 per house. Houses in Lunsar are generally bigger in size than those in the villages.

#### Number of Persons per house

The mean number of persons per house is higher in Lunsar at 16.4 than in the villages at 9.6.

Foradugu has the highest rate, 11.8, for a village.

#### Number of Persons per Room

Again Lunsar has a higher density with 2 persons per room but the difference between Lunsar and the villages is not great in this. Only Foradugu has a density of 1 per room. The mean for the villages is 1.8.

#### Family Units

The number of persons per family unit varies from 10.7 in Mawulay-Mamanso to 5.5. in Kamasundu. Lunsar has 5.7 persons per separate family unit. The significance of these figures will be investigated by the anthropologists.

Lunsar has the highest number of Separate Family Units per house at 2.7. The mean for the villages is 1.3 with Mawulay-Mamanso the lowest at 0.8.

#### Overcrowding

Lunsar has the highest rate of overcrowding at 36.2% of houses. Foradugu is almost as overcrowded at 34.5% but the combined village rate is 26.3% showing that the influx into the town is accompanied by a strain on accommodation. Houses are, however, bigger in Lunsar, but these differences were not measured.

### Latrines

The mean number of persons per latrine is 17 in the villages with a range of 14 at Foradugu to 32 at Mawulay-Mamanso. The mean for Lunsar is 18. The rate for latrines per house is 88% in Lunsar and 55.9% in the combined villages. Foradugu has 83% of houses with latrines, the only village with a health assistant. Other villages have less than half these rates.

### Water Supply

All the villages collect their water from streams and rivers. Sometimes in the dry season, the streams are sluggish and muddy and contaminated.

In Lunsar 74.1% of the households used the towns piped raw water supply, 8 (13.8%) households used their own wells and 7 (12.1%) used the rivers.

The town water supply is untreated and not available in sufficient quantities, as has already been discussed.

It would appear to be superior to the villages' supply in that it comes from a larger source, gross debris is removed from it by straining and the process of storage in tanks and transporting it to stand pipes means that it contains less sediment.

## 13.3. Clinical Data

### 13.3.1. Morbidity

References should be made to Tables 14, 15, 16, 88, 89,



90, 94, 95 & 96 giving clinical data for Lunsar, and the villages.

The rates for disease prevalence are generally greater for males than for females in Lunsar, with the exception of nutritional defects; and generally greater for females than males in the villages, with the exception of malaria. This may be due to the sex structure of village populations which have larger numbers of females, in the older age groups.

#### Malaria

Thick blood films were taken from 96.6% of the Lunsar sample and 99.3% of the villages sample.

In Lunsar, 84.3% of males and 72.0% of females were positive for *Plasmodium falciparum*; and in the villages 94.4% of males and 92.8% of females were positive.

The gametocyte rates for Lunsar were 6.4% males and 6.1% females with corresponding rates of 15.0% and 11.0% in the villages.

The infant parasite rate in Lunsar for both sexes was 91.6% and 79.2% in the villages. The numbers in these samples were small.

Spleen rates for the 2 - 9 age groups were 97.0% for males and 91% for females in Lunsar and 100% for males and 98.6% for females in the villages. The adult rates were 18.1% for males and 53.6% for females in Lunsar,

and 41.8% for males and 73.6% for females in the villages. Thus it will be seen that the villages have a worse experience than Lunsar.

It should be borne in mind that the villages were examined in the dry season and Lunsar examined during the rains, but as the region is one where the mean temperature does not fall below 18°C (64.4°F) (See Appendix), malaria is stable and seasonal variation likely to be small.

#### Acanthocheilonema perstans

This was an incidental finding. The rates, for both sexes, were 2.5% in Lunsar and 1.3% in the villages.

#### Onchocerciasis

The whole samples were examined both in Lunsar, and in the villages for clinical signs of onchocerciasis, but one skin snip was taken in 91.6% of both sexes in Lunsar, and 76.3% of both sexes in the villages. This difference is due to the presence in the villages of a high proportion of infants, who did not undergo the operation.

The skin snip positive rate in Lunsar was 49.1% males and 29.5% females, and in the villages it was 47.5% in males and 41.1% in females.

Nodules positive cases in Lunsar were 49.2% males and 43.5% females, compared with 37.7% males and 49.1% females in the villages.

The rate for onchocerciasis positive cases was 54.5% for males and 44.5% for females in Lunsar, and 40.8% for males and 52.0% for females in the villages.

In Lunsar the great trochanter region is the site of election for nodules at 43.9% followed by the iliac crests region at 31.7%. This order is reversed in the villages with 63.8% of nodules in the region of the iliac crests and 17.8% in the great trochanter regions.

54.5% of persons in Lunsar have only a single nodule compared with 27.1% of persons in the villages, whereas 0.5% in Lunsar and 13.0% in the villages have 10 or more nodules.

It will be seen from tables 94, 95 and 96 that the general rates for onchocerciasis positive vary considerably, with the rate for Lunsar, 49.5% lying between the rates for Masimera and Foradugu.

Of the conditions associated with onchocerciasis, hydrocele was seen in 2 cases in Lunsar (1.0% of males) and 8 cases were seen in the villages (1.7% of males).

Elephantiasis was not seen in the clinical sample in Lunsar, although it was seen in medical practice in the town. 5 cases of elephantiasis were seen in the villages, 1.1% of males.

The rates for the villages can be arranged in descending order in relation to distance from the Rokel River.

The distances of the villages and Lunsar from the Rokel River are listed below.

Name of Place	Distance from Rokel River in miles	Onchocerciasis Positive Rate
Mawulay-Mamanso	-	65.9%
Masimera	1	55.6%
Lunsar	2	49.5%
Foradugu	8	42.1%
Kamasundu	16	38.5%

The number of onchocercomata per person may be related to the magnitude of the infection.

The percentage of persons with 10 or more nodules drops from 40.7% at Mawulay-Mamanso to 1.5% at Kamasundu. Lunsar has the lowest rate with 0.5%.

In view of the findings it is reasonable to suppose that distance from the breeding sites of *Simulium damnosum* is a major factor in determining infection rate for onchocerciasis, and it is quite possible that conditions of urban living in Lunsar modify this transmission to some extent.

A better estimate of this can be made by comparing Lunsar with Masimera. Both are within two miles of the Rokel River as will be seen from the map.

The onchocerciasis positive rate for Masimera (55.6%) is higher than that for Lunsar (49.5%) for both sexes. This difference may be further emphasised if the rates are standardised since 42.3% of Masimera's population is under 15 years compared with 36% of Lunsar's population.

Thus although the village of Masimera and the town of Lunsar are almost the same distance from the river, Lunsar has less onchocerciasis.

It is probable that persons living in the town are not bitten so frequently by *S. damnosum* as are persons in the village.

Standardised Rates for Onchocerciasis using Lunsar 10%  
Sample Population

	Lunsar	Masimera
Males	51.6%	62.7%
Females	39.4%	57.5%
Total	45.1%	60.7%

These rates show that Lunsar has considerably less onchocerciasis than Masimera in spite of the fact that they are both situated at about the same distance from the breeding places of *Simulium damnosum*.

Dentition

It will be seen from the tables that dental caries is

a common condition in both urban and rural Africans.

In Lunsar, the D.M.F. rate for males is 60.3% and for females is 57.6%.

In the villages the males have a D.M.F. rate of 46.9% and the females 57.7%. If the rates are standardised, (see Tables 100, 101, and 102), this difference between the sexes in the villages disappears and Lunsar has a higher rate than the villages. In all the villages the females have higher rates than the males, before standardisation. The rates for the individual villages resemble each other closely. It should be noted that caries is prevalent in both temporary and permanent teeth.

#### Gingivitis

This is a prevalent condition. In Lunsar 48.1% of males and 25.1% of females suffer from gingivitis. In the villages the rates are 40.2% for males and 44.1% for females.

#### Eyes.

Uniform opacities were seen in Lunsar in 51.9% of males and 34.6% of females. In the villages, the rate was 45.8% of males and 62.8% of females. These higher rates in females are probably due to the relatively greater numbers of females in the older age groups in the villages.

### Blindness

The rates for blindness are comparatively low. 1.1% of males and 1.0% of females in Lunsar and 0.7% of males and 1.6% of females in the villages.

Of the 4 blind in Lunsar, only one female aged 68 was blind in both eyes. In the villages, of the 12 blind persons, 9 were blind in both eyes.

Of the total blind persons, 11 out of 13 were probably onchocercal in aetiology.

### Abnormal Vision

This was complained of by 8.7% of males and 15.3% of females in the villages. It was not estimated in Lunsar.

The highest rates for both sexes were at Foradugu 15.5% and Mawulay-Mamanso 14.7%.

### Nutritional Deficiency

The definition of nutritional deficiency has been given.

In Lunsar 15.3% of males and 18.3% of females had physical signs of nutritional deficiency. By contrast 66.5% of males and 81.3% of females in the villages had such signs.

McGregor et al (1961) referring to a rural Gambian community stated that mucosal lesions compatible with lack of riboflavin are commoner in some years than in others and that they tend to appear in the period January -

April and, while children do not escape unscathed, the lesions are most noticeable in adults.

The high incidence noted in the villages in Sierra Leone, was found at this time of the year.

When these rates are standardised it is quite evident that persons in the town have a much better nutritional state than those in the villages.

(a) Hair

Females have a relatively higher rate for hypochromotrichia both in Lunsar and in the combined villages. The rate for both sexes is 5.3% in Lunsar and 11.6% in the villages.

(b) Lips

In Lunsar, angular stomatitis is more frequently seen than cheilosis, but in the villages the two conditions are seen with equal frequency. The rates for both sexes for angular stomatitis are 5.3% in Lunsar and 57.0% in the villages. For cheilosis the rates are 1.3% in Lunsar and 55.9% in the villages.

(c) Tongue

Glossitis was seen in 0.5% of both sexes in Lunsar, compared with 9.5% in the villages.

Fissured tongue was 8.9% in Lunsar and 12.9% in the villages.



(d) Bones

Signs of deficiency in bones are rare. 97.4% of the sample in Lunsar had normal bones and 99.3% in the villages. The 1 - 4 age group in both samples was the one most affected.

(e) Skin

The rate for xerosis for both sexes in Lunsar is 5.5% compared with 0.8% in the villages.

Ulcers

Nutritional deficiency may play a part in the aetiology of ulcers.

The rates for the two groups are very similar, 5.5% for both sexes in Lunsar and 5.6% in the villages.

Sex differences are small. Males have a higher rate than females in the villages.

Vaccination

The rate for vaccination in Lunsar was 84.7% for both sexes, 83.6% of males and 85.9% for females having a scar.

In the villages 58.5% of males and 61.7% of females were vaccinated. Protection against this disease is thus better in the town than in the villages.

Umbilical Herniae

For Lunsar 44.4% of males and 47.1% of females have herniae.

In the villages the rates are 59.4% and 51.6% respectively.

From the numbers with herniae in the different age groups, it will be seen that the rate decreases with age. It is much more rare after 35 years.

#### Complaints of Illness

In Lunsar, 59.8% of males and 64.9% of females complained of illness.

In the villages, 68.5% of males and 81.3% of females complained of illness.

To complain of illness or not, is hardly meaningful where a large proportion of persons have malaria parasites circulating in the blood, and may have helminths and other parasitic diseases.

It does mean, however, that a certain proportion of the population do consider themselves to be in normal health.

More persons may have complained of illness than were suffering at the time of examination.

This is because persons complaining received treatment, e.g., for worms, whereas only infants received a sweet when they were well, and so there may have been a tendency for persons to complain of illness, or to complain on behalf of a child, to get the treatment for worms, headache or other conditions.

For this reason more weight is given to objective measurement of disease.

#### Venereal Disease

This was investigated in the villages only. 43.8% of

males of 15 years and over had or had previously had a urethral discharge.

It is unfortunate that a comparison with Lunsar cannot be made. A considerable amount of gonorrhoea was seen in Lunsar in the course of medical practice during the survey period. 8 males (4.2%) in the sample were seen with active gonorrhoea, compared with 9 males (2%) in the villages with active gonorrhoea.

#### Other Conditions

During the villages survey an epidemic of measles was in progress.

Out of 60 cases seen in the sample, 30 were complicated with broncho-pneumonia and 6 with otitis media. A complication rate of 60%.

Many common conditions were seen, e.g., scabies, sepsis, injuries, diarrhoea, etc., and some rarer ones were seen, e.g. ainhum. (See Table 99.)

Diseases liable to epidemic spread and fluctuation in incidence, e.g., measles, diarrhoea, etc., are not reliable when assessing levels of health.

#### Comparison of Certain Morbidity Rates

Tables 100, 101 and 102 give standardised morbidity rates for Lunsar and the combined villages. The method of direct standardisation was used taking the 10% sample census of Lunsar as the standard population.

Table 100

## Standardised morbidity rates

Males

Males

Age in years	Persons			Plasmodia present		Expected cases		Onchocerciasis positive		Expected cases		Nutritional deficiency present		Expected cases		D.M.F.		Expected cases									
	Lunsar 10% sample census	Lunsar clinical sample	Combined villages	Lunsar numbers	Lunsar rate %	Villages numbers	Villages rate %	Lunsar	Villages	Lunsar numbers	Lunsar rate %	Villages numbers	Villages rate %	Lunsar	Villages	Lunsar numbers	Lunsar rate %	Villages numbers	Villages rate %	Lunsar	Villages						
																						Lunsar numbers	Lunsar rate %	Villages numbers	Villages rate %	Lunsar	Villages
Under 1	21	8	33	6	75	26	78.8	15.8	16.5	-	-	-	-	-	-	-	-	-	-	-	-						
1-4	37	16	94	15	93.8	94	100.0	34.7	37.0	-	-	-	-	-	4	25.0	61	64.9	9.3	24.0	4	25.0	18	19.1	9.3	7.1	
5-9	66	26	84	23	88.5	83	98.8	58.4	65.2	2	7.7	10	11.9	5.1	7.9	3	11.5	74	88.1	7.6	58.1	13	50.0	29	34.5	33.0	22.8
10-14	48	19	34	15	78.9	34	100.0	37.9	48.0	4	21.1	12	35.3	10.1	16.9	1	5.3	31	91.2	2.5	43.8	11	57.9	11	32.4	27.8	15.6
15-19	32	14	20	11	78.6	19	95.0	25.2	30.4	11	78.6	12	60.0	25.2	19.2	-	-	19	95.0	-	30.4	4	28.6	9	45.0	9.2	14.4
20-24	34	14	17	9	64.3	16	94.1	21.6	32.0	7	50.0	11	64.7	17.0	22.0	1	7.1	13	76.5	2.4	26.0	12	85.7	8	57.1	29.1	19.4
25-29	62	26	28	25	96.2	26	92.9	59.6	57.6	19	73.1	23	82.1	45.3	50.9	1	3.8	21	75.0	2.4	46.5	15	57.7	18	64.3	35.8	39.9
30-34	37	16	19	13	81.3	19	100.0	30.1	37.0	13	81.3	17	89.5	30.1	33.1	-	-	16	84.2	-	31.2	12	75.0	14	75.7	27.8	27.3
35-39	55	20	29	17	85.0	24	82.8	46.8	45.5	17	85.0	25	86.2	46.8	47.4	-	-	13	44.8	-	24.6	18	90.0	24	82.8	49.5	45.5
40-44	26	10	18	7	70.0	17	94.4	18.2	24.5	8	80.0	14	77.8	20.8	20.2	-	-	9	50.0	-	13.0	9	90.0	14	77.8	23.4	20.2
45-49	19	10	25	9	90.0	22	88.0	17.1	16.7	7	70.0	22	88.0	13.3	16.7	-	-	17	68.0	-	12.9	10	100.0	19	76.0	19.0	14.4
50-54	7	1	13	-	-	11	84.6	-	5.9	1	100.0	10	76.9	7.0	5.4	-	-	6	46.2	-	3.2	1	100.0	12	92.3	7.0	6.5
55-59	9	4	16	2	50.0	14	87.5	4.3	7.9	3	75.0	13	81.3	6.8	7.3	-	-	9	56.3	-	5.1	4	100.0	16	100.0	9.0	9.0
60-64	10	3	8	2	66.7	7	87.5	6.7	8.8	3	100.0	6	75.0	100.0	7.5	1	33.3	4	50.0	3.3	5.0	2	66.7	8	100.0	6.7	10.0
65-69	4	2	7	1	50.0	6	85.7	2.0	3.4	2	100.0	6	85.7	4.0	3.4	-	-	4	57.1	-	2.3	2	100.0	4.0	100.0	4.0	4.0
70-74	1	-	1	-	-	-	-	-	-	-	-	1	100.0	-	1.0	-	-	-	-	-	-	-	-	1	100.0	-	1.0
75+	-	-	2	-	-	2	100.0	-	-	-	-	50.1	100.0	-	-	-	1	50.0	50.0	-	-	-	-	2	100.0	-	-
Total	468	189	448	155	82.0	420	93.8	378.6	436.4	97	51.3	183	40.8	241.5	258.9	11	5.8	296	66.5	27.5	326.1	117	61.9	210	46.9	290.6	257.1
%								80.9	93.2					51.6	55.3					5.9	69.7					62.1	54.9

Direct standardisation

Table 101

## Standardised morbidity rates

Females			Females																								
Age in years	Persons			Plasmodia present				Expected cases		Onchocerciasis present				Expected cases		Nutritional deficiency present				Expected cases		D.M.F.				Expected cases	
	Lunsar 10% sample census	Lunsar clinical sample	Combined villages	Lunsar numbers	Lunsar rate %	Village numbers	Villages rate %	Lunsar	Villages	Lunsar numbers	Lunsar rate %	Villages numbers	Villages rate %	Lunsar	Villages	Lunsar numbers	Lunsar rate %	Villages numbers	Villages rate %	Lunsar	Villages	Lunsar numbers	Lunsar rate %	Villages numbers	Villages rate %	Lunsar	Villages
Under 1	15	6	16	5	83.3	12	75.0	12.5	11.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-4	54	22	100	19	86.4	100	100.0	46.7	54.0	-	-	1	1.0	-	0.5	5	22.7	86	86.0	12.3	46.4	3	13.6	21	21.0	7.3	11.3
5-9	73	29	63	22	75.9	63	100.0	55.4	73.0	3	10.3	7	11.1	7.5	8.1	8	27.6	61	96.8	20.1	70.7	14	48.3	34	54.0	35.3	39.4
10-14	27	13	22	11	84.6	21	95.5	22.8	25.8	2	15.4	6	27.3	4.2	7.4	5	38.5	19	86.4	10.4	23.3	9	69.2	4	18.2	18.7	18.2
15-19	62	22	24	16	72.7	23	95.8	45.1	59.4	6	27.3	11	45.8	16.9	28.4	1	4.5	22	91.7	2.8	56.9	14	62.6	4	16.7	39.4	10.4
20-24	44	17	55	12	70.6	50	90.9	31.1	40.0	8	47.1	35	63.6	20.7	28.0	-	-	45	78.2	-	34.4	10	58.8	22	40.0	25.9	17.6
25-29	63	25	59	13	52.0	55	93.2	32.8	58.7	12	48.0	44	74.6	30.2	47.0	1	4.0	50	84.7	25	53.4	15	60.0	46	78.0	37.8	49.1
30-34	34	13	43	7	53.8	37	86.1	18.3	29.3	10	84.6	35	81.4	28.8	27.7	1	7.7	35	81.4	26	27.7	11	84.6	31	72.1	28.8	24.5
35-39	43	18	26	11	61.1	24	92.3	26.3	39.7	11	61.1	18	69.2	26.3	29.8	-	-	21	80.8	-	34.7	14	77.8	18	69.2	33.5	29.8
40-44	17	6	28	5	83.3	26	92.9	14.2	15.8	5	83.3	27	96.4	14.2	16.4	-	-	23	82.1	-	14.0	5	83.3	23	82.1	14.2	14.0
45-49	19	9	38	5	55.6	37	97.4	10.6	18.5	6	66.7	34	89.5	12.7	17.0	-	-	29	76.3	-	14.5	9	100.0	37	97.4	19.0	18.5
50-54	13	2	16	-	-	15	93.8	-	12.2	2	100.0	14	87.5	13.0	11.4	-	-	12	75.0	-	9.8	2	100.0	15	93.8	13.0	12.2
55-59	8	3	26	1	33.3	20	76.9	2.7	6.2	3	100.0	20	76.9	8.0	6.2	-	-	24	92.3	-	7.4	2	66.7	25	96.2	5.3	7.7
60-64	6	3	20	2	66.7	17	85.0	4.0	5.1	2	66.7	19	95.0	4.0	5.7	-	-	15	75.0	-	4.5	2	66.7	20	100.0	4.0	6.0
65-69	5	3	8	2	66.7	7	87.5	3.3	4.4	3	100.0	6	75.0	5.0	3.8	-	-	4	50.0	-	2.5.5	2	66.7	8	100.0	3.3	5.0
70-74	2	-	10	-	-	6	60.0	-	1.2	-	-	10	100.0	-	2.0	-	-	6	60.0	-	1.2	-	-	9	90.0	-	1.8
75+	1	-	8	-	-	5	62.5	-	0.6	-	-	5	62.5	-	0.6	-	-	7	87.5	-	0.9	-	-	7	87.5	-	0.9
Total	486	191	562	131	68.6	518	92.8	325.8	455.2	73	38.2	292	52.0	191.5	240.0	21	11.0	457	81.3	50.7	402.3	112	58.6	324	57.7	285.5	370.4
%								67.0	93.7					39.4	49.4					10.4	82.8					58.7	52.1

Table 102

## Standardised morbidity rates

Total	Standardised morbidity rates																						Total					
	Persons			Plasmodia present				Expected cases		Onchocerciasis positive				Expected cases		Nutritional deficiency present				Expected cases		D.M.F.				Expected cases		
	Lunsar 10% sample census	Lunsar clinical sample	Combined villages	Lunsar numbers	Lunsar rate %	Villages numbers	Villages rate %	Lunsar	Villages	Lunsar numbers	Lunsar rate %	Villages numbers	Villages rate %	Lunsar	Villages	Lunsar numbers	Lunsar rate %	Villages numbers	Villages rate %	Lunsar	Villages	Lunsar numbers		Lunsar rate %	Villages numbers	Villages rate %	Lunsar	Villages
Age in years																												
Under 1	36	14	49	11	78.6	38	77.6	28.3	27.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1-4	91	38	194	34	89.5	194	100.0	81.4	91.0	-	-	1	0.5	-	0.5	9	23.7	147	75.8	21.6	69.0	7	18.4	39	20.1	16.7	18.3	
5-9	139	55	147	45	81.8	146	99.3	113.7	138.0	5	9.1	17	11.6	12.6	16.1	11	20.0	135	91.8	27.8	127.6	27	49.1	63	42.9	68.2	59.6	
10-14	75	32	56	26	81.3	55	98.2	61.0	73.7	6	18.8	18	32.1	14.1	24.1	6	18.8	50	89.3	14.1	67.0	20	62.5	15	26.8	46.9	20.8	
15-19	94	36	44	27	75.0	42	95.5	70.5	89.8	17	47.2	23	52.3	44.4	49.2	1	2.8	41	93.2	2.6	87.6	50	18	50	13	29.5	47.0	27.7
20-24	78	31	72	21	67.7	66	91.7	52.0	71.5	15	48.4	46	63.9	37.8	49.8	1	3.2	56	77.8	2.5	60.7	22	71.0	30	41.7	55.4	32.5	
25-29	125	51	87	38	74.5	81	93.1	93.1	116.4	31	60.8	67	77.0	76.0	96.3	2	3.9	71	81.6	4.9	102.0	30	58.8	64	73.6	73.5	92.0	
30-34	71	29	62	20	69.0	56	90.3	49.0	64.1	23	79.3	52	83.9	56.3	59.6	1	3.4	51	82.3	2.4	58.4	23	79.3	45	72.6	56.3	50.1	
35-39	98	38	55	28	73.7	48	87.3	72.2	85.6	28	73.7	43	78.2	72.2	76.6	-	-	34	61.8	-	60.6	32	84.2	42	76.4	82.5	74.9	
40-44	43	16	46	12	75.0	43	93.5	32.3	40.2	13	81.3	41	89.1	35.0	38.3	-	-	32	69.6	-	29.9	14	87.5	37	80.4	37.6	34.6	
45-49	38	19	63	14	73.7	59	93.7	28.0	35.6	13	68.4	56	88.9	26.0	33.8	-	-	46	73.0	-	27.7	19	100.0	56	88.9	38.0	33.8	
50-54	20	3	29	-	-	26	89.7	-	17.9	3	100.0	24	82.8	20.0	16.6	-	-	18	62.1	-	12.4	3	100.0	27	93.1	20.0	18.6	
55-59	17	7	42	3	42.9	34	81.0	7.3	13.8	6	85.7	33	78.6	14.6	13.4	-	-	33	78.6	-	13.4	6	85.7	41	97.6	14.6	16.6	
60-64	16	6	28	4	66.7	24	85.7	10.7	13.7	5	83.3	25	89.3	13.3	14.3	1	16.7	19	67.9	2.7	10.9	4	66.7	28	100.0	10.7	16.0	
65-69	9	5	15	3	60.0	13	86.7	5.4	7.8	5	100.0	12	80.0	9.0	7.2	-	-	8	53.3	-	4.8	4	80.0	15	100.0	7.2	9.0	
70-74	3	-	11	-	-	6	54.5	-	1.6	-	-	11	100.0	-	3.0	-	-	6	54.5	-	1.6	-	-	10	90.9	-	2.7	
75+	1	-	10	-	-	7	70.0	-	0.7	-	-	6	60.0	-	0.6	-	-	8	80.0	-	0.8	-	-	9	90.0	-	0.9	
Total	954	380	1010	286	75.3	938	93.5	704.9	889.3	170	44.7	475	47.0	430.7	499.4	32	8.4	755	74.8	78.6	7344	229	60.3	534	52.9	574.6	508.8	
%								73.9	93.2					45.1	52.4					8.2	77.0					60.2	53.3	

From the tables it will be seen that expected cases and rates are higher in the villages than in the town for malaria, onchocerciasis and nutritional deficiency. The D.M.F. rates for the town are higher than for the villages.

It will also be noted that rates for males are higher than those for females for malaria, onchocerciasis, and D.M.F. Females have higher rates than males for nutritional deficiency.

#### 13.3.2. Physiological Data

Apart from haemoglobin levels, physiological measurements were not made in the villages.

The trend was for mean haemoglobin levels for sex and age group to be lower in the villages than Lunsar.

The mean haemoglobin level for all ages in Lunsar is 58.2% for males, 8.1 gms/100 ml. and 56% for females, 7.8 gms./100 ml.

The corresponding figures for the combined villages are 52.6% for males and 53.1% for females, being 7.3 gms./100 ml. for both sexes.

#### 13.3.3. Fertility and Survival

Table 103 shows the rates for fertility and survival indices for the villages separately and combined for comparison with Lunsar.

TABLE 103.

FERTILITY and SURVIVALVILLAGE RATES for COMPARISON with LUNSAR.

Name of Place	Crude Birth Rate/1000	General Fertility Rate/1000	Non-Fertile Ever-Married Females %	Sterility Rate/100%	Multiple Pregnancy Rate/1000	Sex Ratio at Birth M/100F	Infant Mortality Rate		Stillbirth Rate:		Abortion Rate		Infant Deaths Toddler Deaths Ratio	Family Size.
							/1000	Total Sample /1000	/1000	Total Sample /1000	per 1000 Pregnns.	per female		
Masimera	79.5	283.5	9.9	4.4	25	95.5	52.6	252.8	-	118	74.2	0.39	1.3	5.6
Kamasundu	49.4	183.6	11.5	4.0	17	125	111.1	191.2	52	102	76.9	0.38	1.06	5.8
Mawulay-Mamanso	54.2	218.7	9.3	9.3	19	99	142.8	246.3	-	59	116.4	0.6	1.7	6.0
Foradugu	61.1	223.6	9.3	1.3	22	87.1	117.6	254.9	150	114.9	59.1	0.28	1.5	5.1
Combined Villages	60.4	223.4	10.8	4.1	20	103	98.3	230.7	61.5	103.6	76.9	0.39	1.3	5.6
Lunsar	86.8	300	11.8	2.9	27	101.6	212.2	203.8	57.1	66.8	113.8	0.41	1.5	4.7



The Crude Birth Rate and General Fertility Rate are higher for Lunsar than for any of the villages, and would seem to be the more reliable rates. 11.8% of females in Lunsar who were married or had been married, had never been pregnant compared with 10.8% of females in the same group in the combined villages. These are the non-fertile married females.

Glass and Grebenik (1954) extracted the data on rural Irish from the 1911 Census and showed that for unbroken marriages there were rates of childlessness of 4.5% and 6% for women at ages 20 - 24 and 25 - 29 respectively.

The rates in Lunsar and the villages are high and these might be related to the high prevalence of gonorrhoea noted in the males of the population. The Infant Mortality Rate for Lunsar is considerably greater than that for the combined villages. The numbers involved are small in Lunsar and it is unlikely that these differences are significant. If the rates are calculated using total samples of females then Lunsar has a lower rate than the villages. It is reasonable to use these rates (a) because the number of deaths under 1 year and of births in a given year are small, making rates calculated in the conventional way unreliable, and (b) because infant deaths have probably not been decreasing at a great rate during the period under review in the villages, are not markedly

so in Lunsar (See Table 30a).

The Sterility Rate for Lunsar (2.9%) is lower than for the villages (4.1%) but the Multiple Pregnancy, Stillbirth and Abortion rates are of much the same order. The Infant deaths-Toddler deaths ratio in Lunsar is more favourable, showing that deaths in the 1 - 4 years group have been proportionately reduced.

#### Family Size

It should be recalled that Family Size was defined as a biological rather than a social concept. It is not concerned with the average number of persons in a household nor the average number of dependant children in a family. In a society where polygyny is common the social concept of a family size is different from Western Society but the average number of live births to married females of completed fertility may be compared in the two areas.

In comparing the distributions of ever-married women by number of children born alive, for Lunsar and the combined villages, it will be seen that the average number of live born children for females of completed fertility was 4.7 in Lunsar and 5.6 in the combined villages. Since the marriage rates in the two areas are high, in the age group 45 - 54, 92.2% males in Lunsar and 97.3% males in the villages and all females, this reduction in family size must be due to voluntary limitation.

### Standardised Rates

In Table 104 the standardised Births and Deaths calculated for Lunsar and the villages are given, using the 10% Sample Census of Lunsar as the Standard population. These figures are based on the obstetric histories of all the females of 15 years and over in Lunsar and the villages.

From the tables it will be seen that Lunsar has fewer expected births and fewer expected deaths than the combined villages. Using the obstetric histories of all the females in the sample, 60.6% of their live births were surviving, at the time of enquiry, at Lunsar, compared with 49.9% in the combined villages. Females had higher survival rates than males both in Lunsar and in the villages.

### Public Health Activity

It is quite clear from the description of medical and sanitary services that the town dweller has some services at his disposal whereas the villager has almost none. Thus in respect of public health activity and curative medical services the villager is certainly neglected. In almost all fields affecting human health and welfare it is evident that the town dweller is better off than the villager in this region of Sierra Leone. The reasons for these important conclusions will now be discussed.

Table 104

## Standardised births and deaths

Age	Female persons			Live births totals				Expected live births		Deaths				Total	
	10% sample census	Lunsar clinical	Combined villages	Lunsar	Lunsar rate %	Villages	Villages rate %	Lunsar	Villages	Lunsar	Lunsar rate %	Villages	Villages rate %	Lunsar	Villages
15-19	62	22	24	11	50.0	7	29.2	31.3	18.1	3	13.6	2	8.3	8.4	5.1
20-24	44	17	55	33	194.1	101	183.6	85.8	80.8	10	58.8	33	60.0	25.9	26.4
25-29	63	25	59	71	284.0	216	366.1	178.9	230.6	22	88.0	108	183.1	55.4	115.4
30-34	34	13	43	51	392.3	168	390.7	133.4	132.8	19	146.2	68	158.1	49.7	53.8
35-39	43	18	26	74	411.1	122	469.2	176.8	201.8	29	161.1	61	234.6	69.3	100.9
40-44	17	6	28	29	483.3	177	632.1	82.2	107.5	5	83.3	94	335.7	14.2	57.1
45-49	19	9	38	38	422.2	195	513.2	80.2	97.5	15	166.7	100	263.2	31.7	50.0
50-54	13	2	16	8	400.0	84	525.0	52.0	68.3	5	250.0	46	287.5	32.5	37.4
55-59	8	3	26	16	533.3	167	642.3	42.7	51.4	13	433.3	93	357.7	34.7	28.6
60-64	6	3	20	12	400.0	124	620.0	24.0	37.2	8	266.7	66	330.0	16.0	19.8
65-69	5	3	8	20	666.7	39	487.5	33.3	24.4	14	466.7	22	275.0	23.3	13.8
70-74	2	-	10	-	-	52	520.0	-	10.4	-	-	28	280.0	-	5.6
75+	1	-	8	-	-	43	537.5	-	5.4	-	-	28	350.0	-	3.5
Total	317	121	361	363	300.0	1495	414.1	919.9	1066.2	143	118.2	749	207.5	361.1	517.4

Lunsar Villages

Expected live births (15-49 age groups) 767.9 869.1

Expected deaths (15-49 age groups) 254.6 408.7

#### 14. Discussion.

##### General Epidemiological Considerations

Mention should be made of the epidemiological features of village and town life. Apart from the general consequences of living in isolation or in communities on man's social and cultural development and therefore, indirectly on his health, there is also an immediate and direct one.

Complete isolation interferes not only with cultural traditions but also with the transmission of most infections. After one or two generations without outside contacts, members of the isolated group have lost any acquired immunity to these infections.

They may be healthy, their physique sound if the food supply is adequate, but their health is vulnerable.

If outsiders, traders or seamen introduce organisms of even the mildest disease (measles or influenza for instance) many of the isolated community will be attacked by the infection and some will die. Hence the partial, if not complete, wiping out of the populations of isolated settlements. Islands of the Pacific have been known to lose two thirds of their population on account of measles, or, quite recently, to have large numbers crippled by poliomyelitis.

Community life, on the other hand, does create more

chances of mutual infection with resulting immunity of a greater variety of diseases, due to contact with other communities and their infections.

Large cities present the most opportunities for acquiring numerous infections and building up resistance at an early stage. There, endemicity will tend to replace epidemics.

As long as the population of a rural village has little contact with the town it is reputed 'healthy', but when its inhabitants go to town - virgin soil for infection - they fall an easy prey to communicable diseases. In urbanised countries, communicable diseases which at first were considered the scourge of large cities have gradually invaded remote towns and villages, eventually to dwindle there. In Sierra Leone, daily communications and contact by road transport are common between town and village. No area is truly isolated.

Whether in a village or town, human agglomeration will result in pollution of water supplies and the soil causing water and food borne diseases. These factors can be offset by sanitation, and available medical care will prevent and cure many of the diseases.

In the context, of Lunsar, and the neighbouring villages, the diseases seen are common to both. Sewage disposal is by the same means and fairly evenly dis-

tributed. Water is slightly better in Lunsar. Housing is better in Lunsar, but more crowded than in the villages. Medical care is almost non-existent in the villages, but is available in Lunsar. Nutrition due to regular wages and availability of foods is much superior in Lunsar. These two last mentioned factors must account for a considerable part of the improved health seen in Lunsar.

In assessing the effect on health of the change from village life to town life, I would like to refer again to the fundamental definition of health.

The definition of health is notoriously difficult. "Complete physical, mental and social well-being" as defined by the World Health Organisation is a description to which all will subscribe but which turns out to be very difficult to measure.

There is a complex relationship between physical and mental health on one side and the environment on the other and as a result 'health' means different things to different people under different circumstances.

In studying the health of the population of Lunsar and comparing it with the populations in the neighbouring villages it will be taken as having been demonstrated that the populations have similar characteristics with regard to tribe, language and religion and that we are dealing with the same types of persons in different

environmental and occupational circumstances.

Population Structure

The population structures differ, that of Lunsar being more evenly balanced from the point of view of sex distribution, especially in the young adult age groups, compared with the villages.

The population structure of an 'ideal' community has never been defined. It would, indeed, depend on the occupation and function of the community. However, it is probable that a community with an evenly balanced sex ratio and with adequate and even numbers of both sexes in the working age groups is in a healthier state than the village communities whose young male populations are proportionately diminished yet who rely on agriculture exclusively for subsistence.

The population structure of the village means that the females are obliged to take part in the agriculture in addition to the bearing and care of children, the preparation and cooking of food and looking after the house. It is reasonable to say that the women in the villages have a harder life than the women in the towns. This will adversely effect the health of the women and the children.

Civil State

The civil state of the inhabitants of Lunsar and the

*Does this  
show that  
the village  
is unsatisfactory  
or that  
migration is  
unavoidable*



villages differ in an interesting way. Lunsar has a considerable population of young unmarried men compared with the villages. Among those who are married only one in five of the marriages are polygynous in the town compared with one out of two in the villages. This diminution of the multiple marriage rate can be taken to be a function of urbanisation. In the villages, the extended family system where a man has multiple wives and perhaps members of his own, and in-law, families living with him means that more hands can be used on the land and the feeding of the extra mouths comes from their joint productivity.

*Amos*

In the town the pressures operate in the opposite direction especially if the man is earning a wage. Wives are expensive in Africa, to buy and to maintain. Food has to be purchased by cash, and for an extended family group the wage packet will not go very far. Only the rich can afford multiple wives and bear the burden of the extended family group in the town.

Although many women in the town are traders and make reasonable amounts of money in some cases, they are also insistent that their husband provides for them at what they consider to be a reasonable standard. One new frock every two months is considered reasonable in Lunsar, where the women are clothes and fashion conscious.

The village women are not so well nor so fashionably dressed as the townsfolk, and have not learned to be so exigent.

The men in the town, especially those working for industry have ambitions to own better clothes, wrist watches, bicycles, motor cycles, refrigerators, etc. This cannot be done with multiple wives and the extended family group. There is a strong drive to modernise in the town, to follow the pattern of Western civilisation and to 'get ahead'. The elegant Temne girls in traditional Temne costume with high heeled shoes riding pillion on her boyfriend's motor cycle is a part of the Lunsar scene, utterly remote from the villages only a few miles away. Such ambitions are encouraged by the cinema, the newspapers, the magazines with all the usual advertisements directed at the African public. The public viewing of television in the Ibadan region in Nigeria will speed this process there and in other places similarly served.

People with this drive cannot afford large numbers of children and insist on educating those that they have. More care is thus given to the fewer children which are born in town with the consequent improvement in health.

Survival rates are higher in Lunsar than in the villages, and the parents with fewer children living in the town can expect them to be more likely to survive.

This is also true of the two occupational groups in Lunsar, the urban group having better survival rates than the rural group.

### Migration

Since Lunsar is a rapidly growing town it would be expected that a large proportion of the town's inhabitants would be immigrants and this proves to be the case and contrasts markedly with the comparative stability of the villages. Nevertheless, the villages have been depleted, especially in the males of the working age groups.

Hill (1925) in his study of internal migration and its effects on the death rates in the County of Essex, noted that mortality rates in the towns in the first five years, and in the decline of adult life, were higher than in the rural areas. In the period of adolescence and young adulthood, death rates were lower in the town than in the country. He showed that the migrants to the town moved to secure work at a higher pay relative to their earnings in the rural districts, the females moving into domestic service of a high class type. He considered that it was the bright and stronger (mentally, if not physically as well) of the young men and women in rural districts who tended to migrate; in the country villages there remained the weaker element. Farr (1870) considered that the immigrants to the towns at ages 15 - 35 were 'lives good

above the average'. Hill also considered that a relatively small number of migrants fell ill and returned home to die, while a country nucleus once established in the town, grows with rapidity by importation of friends and relatives. He also found that rural housing was bad and that diet was low, and that the greater part of the excess in rural death rates was probably due to a population weakened by selection succumbing to disease which the general conditions of their life do not assist them to overcome.

Although no comparative figures for mortality rates for similar age groups for Lunsar have been obtained the factors mentioned by Hill are relevant to the African situation. Africans undoubtedly move to secure work at higher pay. Having moved they are less likely to fall ill because of a raised living standard and, if ill, they may get good treatment at the Marampa Mines Health Centre or at least some treatment in the town. Rural housing and diet are of low standard. Hill found that the brighter and stronger tend to emigrate and this may well be true at the present time in Lunsar. However, it has already been pointed out that many freed slaves came to Lunsar in 1927 and these are not the 'brighter and stronger' of the rural community.

### Education

Education and health are correlated and since literacy and school attendance are so much greater in the town than in the country it would be expected that the levels of health followed this indicator.

Education occurs only in the house and fields in the villages but in the town it occurs in school and in extra-curricular activities as well.

Time is spent with school mates and teachers and with organised outside activities such as football, concerts, Boy Scouts and Girl Guides. The boy or girl makes wider contacts than those of his homestead or village and this is stimulating and instructive.

In addition to school education there is the Apprentice Training School of the Sierra Leone Development Company for the selected trainees. This is the only kind of education apart from primary education available in the area. The period of training lasts four years.

Literacy enables people to read books, magazines, newspapers, and to understand the cinema. The desire for reading material is great and hard to satisfy in Lunsar. The Church Missionary Society mobile bookshop does a round of the towns and sells general literature as well as religious books. Africans who are literate will read almost any material even though they may not

understand much. I have seen an African servant carrying the 'Financial Times'. He was able to read little of it but enjoyed the status of carrying a newspaper.

#### Religion

There are large congregations of the different religions in the town, not just the worshipping kin groups of the village. This enables more contacts to be made. Almost the only contact with Christian teaching is in the towns.

#### Occupation

Some occupations are healthier than others in that the occupation itself or the environment in which it is carried out may be more or less hazardous to the health of the worker.

The industry of open cast iron mining is a healthy one, there being no specific hazards in the processes of mining nor in the ancillary transportation systems. It might be anticipated that accidents would be at a high rate but the machinery used is of the most modern type and well maintained and guarded. The mill itself for concentrating the ore has surprisingly few moving parts so that the accident rate is kept at a low level.

The railway to Pepel and the road transport employed, is modern, well maintained and supervised.

Working hours are eight daily and the amount of pay is laid down by the Government in consultation with the Trade Unions and the industry. The minimum wage for an unskilled labourer was 6/7d per day but skilled workmen were earning £1 per day and African administrators over £1,200 per annum.

In addition to the wages, every employee received a kettle of rice every two weeks and purchases at a works canteen could be made at prices below the current market prices.

The advantages of working for the mining industry are regular wages and perquisites, the skills that can be learned in the organisation and training schools run by the industry, and the knowledge and familiarity with machinery and technology, which enables workers to learn to run their own electric lighting plant, refrigerator or motor bicycle, etc., and which leads to an understanding of science. Contact with the European also allows infiltration of ideas and methods across to the African workers such as food handling, personal hygiene and mode of dress. The integrity of the European is admired and trusted.

Africans appear to take working for a large industrial concern in their stride. There are plenty of features

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of tribal, religious and indeed rural life in the town for those fresh from the country to feel sufficiently at home.

The stresses the people bear are the stresses they always had, fear of witchcraft causing illness and death, fear of failure, and impotence, a woman's fear of being ousted by a younger dominating wife, fear of barrenness and childlessness.

Tooth (1950) in his "Studies in Mental Illness in the Gold Coast" found that there was no evidence in support of the hypothesis that psychosis was commoner in the Westernised group than in the rest of the population, a finding agreeing with Cunyngham Brown's impression from Nigeria. (1938).

#### Medical Care

Not the least of the advantages of working for the mining company is the free medical treatment, both in-patient and out-patient for the worker and his family at the excellent Marampa Mines Health Centre.

With a labour force of approximately 2,400, the 45,274 out-patient attendances and 1,668 in-patient admissions at the mines hospital are made up largely of entitled workers' families. The utilisation of medical services and the benefits they bring are realised by the workers

and confidence in western medicine is acquired by these means.

The effect of this hospital and its services on Lunsar must be considerable.

The Roman Catholic Mission opened a hospital in late 1960 at Mabesene near Lunsar, and this will undoubtedly play an increasing part in Lunsar's health and welfare.

In addition to these hospitals, the Government Hospital at Port Loko 24 miles away, is the base hospital for the area. The ambulance can be summoned by telephone from Lunsar Post Office.

On the spot is the Lunsar Health Centre, with a Dispenser and Assistant Dispenser and two Midwives, one trained, always available.

Lunsar is served by medical services at all levels and this is in marked contrast to the situation in the villages. The most fortunate village, Masimera, had a resident midwife but the others had nothing. Kamasundu had a woman healer using native medicine and a Dispensary at Rosint some 5 miles away.

That there is great need in the villages can be seen from the tables listing the clinical conditions seen and their prevalence. Transportation from the villages to the nearest place where medical care can be obtained is by lorry. In this the patient has to travel with the sacks of groundnuts, rice, etc., over corrugated dirt

roads. The lorries or 'Mammy Wagons' run only when there is a pay-load and the patient must pay for his own passage.

A patient with acute retention of urine travelled 10 miles in a 'Mammy Wagon' in order to see me at Foradugu.

### Farming

The occupation of farmer is a hard one. The impression that many people have of Africans lying in hammocks on the verandahs of houses in villages is that farming is a lazy life. The contrary is the case. The work on the land is hard and the conditions under which it is carried out are rough. The farmer is exposed to dust, rain, biting insects, snakes, etc., and the fields have to be prepared according to schedule if the planting is to be achieved at the correct time. There are, of course, times when the farmer works very hard and when he is slack. The result of farming on the individual may be observed on the skin of the feet, ankles and legs. The person brought up on a farm has transverse lichenified striations across the front of the ankle at an early age due to the exposure of the occupation. Africans brought up in towns do not have this sign to such a marked degree.

### Food

The harvest is subject to adverse weather, insect

pests, price fluctuations and other influences. The habit of making 'rice debts' at high interest rates penalises the farmer should he have a bad year. It must be remembered that in a country such as Sierra Leone freight is added to the price of an article. To the cost of a sack of rice at the controlled price in Freetown, must be added freight at high rates to the villages or elsewhere. Food in the villages, other than locally grown produce, tends to cost more than in Lunsar. Thus, bonga, the dried fish from the coast and an important source of protein costs about 5d in Lunsar and 9d in Kamasundu.

This is one factor of the food situation. In the town a great variety of foods can be bought in the market and in the shops compared with the meagre possibilities of the village.

The basic difference between rural and urban food supplies lies in the fluctuation of stocks in the villages. Before the harvest comes in, many families live on a little rice with a sauce made of green leaves. This is the 'Hungry Season' when the number of meals eaten per day may have to be cut down to one. The variety of proteins used in the villages is smaller than in the towns. Poultry, fish and meat are used in the villages, but in the town these may be supplemented by varieties of dried fish, meat from the butchers is available three

times per week and canned foods such as sardines at 9d per tin are available to make the sauce for the rice.

### Housing

The Temne round house has lost ground in Lunsar to the rectangular house to the extent that there are only a handful of the round type of structure left and these are fast disappearing. The villages, on the other hand, still have considerable numbers.

The disappearance of the round house is coincident with the appearance of the corrugated iron roof which can more easily be fitted to a rectangular shape. Although the corrugated iron roof has <sup>dis</sup>advantages it is easy to understand its appeal in durability and prestige to the Africans. It is probably a cleaner sort of roof than thatch, in the sense that less vermin tend to be sheltered by corrugated iron.

The houses in Lunsar are bigger and have more rooms than village houses and the density of persons per house is almost twice that of the villages, and the density of persons per room is slightly greater. More than one in three houses in Lunsar are overcrowded, compared with one in four in the villages.

This means that housing is of a better standard in Lunsar but it is more crowded, as one would expect in the town.

On the whole, Lunsar is well laid out on the grid system and the building regulations regarding structure of houses and layout are well supervised and implemented by the Health Inspector. The houses are well spaced and constructed. That this state of affairs does not occur without supervision and application of sound housing regulations may be realised on visiting townships in other countries where the regulations are faulty or not vigorously applied.

#### Sanitation

The number of latrines per person is much the same in Lunsar as in the villages, although there are more houses with latrines in the town than in the villages.

There will be a greater tendency to use latrines in Lunsar because of the need for privacy, whereas in the villages, the bush is easily accessible. The water supply of the town, poor and inadequate though it is, is much better than the supply of the villages. All water sources seen in the villages in the dry season were, by their nature, heavily contaminated. At least the water supply of Lunsar is at stand pipes and the effort of fetching and carrying of water is cut down.

The Africans are clean people. They will wash and bathe frequently if water is available.

The washing and bathing parties are frequently seen

in streams and rivers. Villagers, as a group, are dirtier than the townspeople because water is less accessible and available, and soap is more expensive in the villages.

The standards of clothing are also affected by availability of water. Clothes, as well as bodies, are dirtier in the villages, and standards of dress tend to be much higher in Lunsar. Shoes are more likely to be worn in the town. The wearing of a foot covering of some sort is of importance in the prevent of hookworm, fungus infections, sepsis and injury to the feet. The wearing of shoes occurs at a fairly high rate in Lunsar but is rare in the villages.

Sanitary services in the town control rubbish disposal and the burial of the dead. In the town the dead are buried in cemeteries which are under the supervision of the Health Inspector. It is not so easy to bury a body in the house or its precinct in the town. Foradugu has an assistant health inspector, otherwise the villages are devoid of sanitary services.

In connection with rubbish, it should be mentioned that the housefly is not very much in evidence in this part of West Africa, compared with, say, the Middle East. This may be because of the rains and the scavengers.

The residual spraying of houses in Lunsar with D.D.T. started during my stay there and has continued at regular intervals since then. This service is performed free of charge by the Epidemiological Diseases Control Unit of the Mining Company.

Thus the environment in the town tends to be more free of insect vectors, and other arthropods, reptiles, etc., than the villages. This is also a function of the structure of the town. There are streets with drainage and houses, instead of fields and most animal life will tend to be pushed to the periphery of the inhabited area.

#### Transport

This has a bearing on health. Availability of transport and reasonable road communications enable medical care to be utilised. Law and order, and trade also are facilitated by communications. Many villages are relatively isolated by lack of roads.

In Lunsar, fairly rapid and easy communications with Freetown, about three hours away, are taken advantage of by the townsfolk.

The journey is made for trading, shopping, football and cinema outings, etc. Easy transport must have a considerable part to play in breaking down tribal barriers and in developing national consciousness in a country such as Sierra Leone.



### Social Aspects

The town has more amenities than the villages, and there are organised activities such as football, cricket, dance societies, etc.

Football is an activity which is enthusiastically carried out and supported. It cuts right across tribal and race affiliations in encouraging locality loyalty. In Lunsar, Temne, Fulah, Mende, Creole, Lebanese and others play for the same team. The local teams get keen support and great interest is taken by the town in general.

The dance societies organise occasions when the girls dress up in a sort of uniform and go dancing through the streets of the town. These girls are clean, smartly dressed, made up and elegant and it is an occasion to show themselves off.

There are many bars in Lunsar where a considerable amount of drinking of beer and palm wine occurs, especially after pay day.

In one or two bars, dancing to a record player goes on. There is a shortage of unattached girls in town and many men may be seen dancing together either jiving or doing 'High life'. This does not seem to have any homosexual implications.

Occasionally dances are held in the court house in

Lunsar, and only a few girls attend these. It is still the mark of an evolved girl to go dancing with men. It is noticeable that hospital nurses hold European style dances.

Dancing is an important feature of African life, accompanying almost all social and magical activities, which is encouraged in a child as soon as he or she can walk. Toddlers dance to their own drumming and ability to keep any rhythm becomes second nature. Even evolved and highly formal Africans never lost this ability. The dance is the principal medium of folk art and there are dances for every occasion and for every age and both sexes.

The town is also the environment where the criminal, crook, the antisocial and the prostitute can live. These cannot flourish in a village mainly because everybody knows everybody else and crime depends on having a victim to cheat or injure.

Theft occurs more frequently in Lunsar. That houses in the town are never left unoccupied is indicative of this.

Hashish (bhang) is cheap and easily bought in Lunsar but I did not meet any cases of addiction. It is, of course, an offence to smoke this drug.

Prostitutes are available in Lunsar. A brothel was in the census sample and this was conducted on the lines of a family business, most of the prostitutes were relations. In some parts of town prostitutes jointly rent a house and do not have a brothel keeper in charge. The profession does not appear to carry a social stigma.

Homosexuality appears to have characteristics in Africa which are similar to the manifestations in our own society, but no enquiry was made into this.

People who carry on the activities just described are present in all urban communities without exception.

#### Health Assessment

It is evident from the study which has been described, that the health of persons in Lunsar is better than that in the villages from the point of view of malaria, nutritional deficiency and onchocerciasis.

The rates for onchocerciasis are seen to be related to the distance of the place from the sites of breeding of the insect vector, but town life protects from infection to some extent. The rates for males in both situations are generally higher than those for females with the exception of nutritional deficiency.

Persons in Lunsar are better protected from smallpox judging from their vaccination rates.

From the physiological data it can be seen that the town has slightly higher haemoglobin levels than the

villages.

In fertility and survival rates it was shown that although Crude Birth rate and General Fertility rates are higher for Lunsar than for the villages, there tend to be fewer births per female in Lunsar and that survival of these infants is better in the town than in the villages. Family size is smaller in Lunsar, than in the villages, thus more care can be given to the child in the town.

For almost all pathological conditions investigated the villagers are worse off than the town. Exceptions to this, are the D.M.F. and gingivitis rates where the town is worse off than the villages.

It thus appears that urbanisation is a condition favourable to this African community.

This is the reverse of the situation which occurred in Britain in the first half of the last century. The time factor is an important one in that an industry in mid-twentieth century is frequently electrically operated and workers are under excellent environmental conditions of labour. The curative and preventive medical services, housing, education and welfare provided by the industry ensure that the physical and social needs of the worker are cared for.

## 15. Summary and Conclusion

The effect of urbanisation on health was studied during the period October 1958 to April 1962 with field work in the Northern Province of Sierra Leone, in two periods, April to December 1959 and December 1960 to April, 1961. Near the Sierra Leone Development Company's open cast iron mine at Marampa, the village of Lunsar, which consisted of 7 houses in 1926 became an important new town with 300 houses in 1936 and 580 in 1960.

The object of the study was to compare levels of health in Lunsar with those of the villages of similar tribal composition, in the surrounding region.

In order to do this a 10% Sample Census of Lunsar was made, and using the census as a frame, a 4.0% clinical sample of all Lunsar was examined. From the nature of the samples they were comparable in age and sex structure but also they were shown to be comparable with respect to tribe, civil status, religion, occupation and other relevant factors. The population of Lunsar was 9,540 on 31st July, 1959. The persons in the clinical sample were given a physical examination and obstetric histories were taken from all females of 15 years and over. A total of 380 persons were examined.

From the census and clinical samples, the population

and its characteristics were defined and rates of morbidity, fertility and survival were calculated.

Using rates for malaria, onchocerciasis, and nutritional deficiency and calculating infant mortality, it was shown that the urban occupied inhabitant and his dependants had a more favourable experience than the rural occupied dwellers in Lunsar.

Data were also collected in Lunsar on environmental conditions such as housing including rates for overcrowding, water supplies and disposal of excreta.

The second part of the study consisted in an examination of four villages situated between 7 and 20 miles from Lunsar. Total populations were seen in three and a half sample was taken of a fourth, a total of 1,010 persons.

From all the villages examined, which consisted entirely of Africans, persons had left to take up residence in Lunsar and work in the mines.

Census and clinical examinations were carried out in a manner similar to that in Lunsar, and the village populations were found to resemble each other in structure, civil state, religion, occupation and other factors, as well as morbidity and survival rates. Data on environmental conditions were also collected. The material from the four villages was combined and compared with Lunsar.

A. In population structure, Lunsar is more evenly balanced between the sexes, there being a female predominance in the villages. In the age groups the villages have more persons under 15 years and over 50 and comparatively fewer in the age groups 20 - 39. In the villages there are twice as many females as males in these groups. Thus a female of marriageable age wishing to marry has more chances of meeting a suitable single male in the town.

In both Lunsar and the villages the population under 20 is greater than that between 20 and 40 so that populations will tend to increase.

In civil status, half the males in the age groups 20 - 35 were married in Lunsar, compared with 75% in the villages. 93% of females in Lunsar and all females in the villages in these groups were married. Twice as many marriages were polygynous in the villages compared with Lunsar. The dominant tribe in both situations were Temne but Lunsar has a greater variety in tribal composition as would be expected. In occupation the villagers are mainly farmers whereas in Lunsar working for industry is the commonest male occupation. Because of the predominance of females in the working age groups in the villages many women are obliged to do hard physical work in the fields as well as bearing and bringing up the children. This has repercussions on the health of the whole family.

B. In environment, using the Housing (Scotland) Acts as a basis, Lunsar has more overcrowding than the villages, but very little more than its nearest rival. The houses in Lunsar are bigger in size and number of rooms and better constructed than those in the villages. Since people in Africa spend most of the time outdoors, the factor of overcrowding only operates at night. There is piped unpurified water in Lunsar, but only contaminated streams or ponds in the villages.

The mean number of persons per latrine is similar in both situations, but there are more latrines per house in Lunsar than in the villages.

C. For Morbidity rates in the two situations it was found necessary to use direct standardisation in view of the differences in population structure in the two areas. For malaria, onchocerciasis and nutritional deficiency it was shown that the town has a more favourable experience than the villages. For the D.M.F. (Decayed-Missing-Filled) rate the town has a worse experience than the villages. The rates for males in both situations are generally higher than those for females, with the exception of nutritional deficiency, where the opposite occurs.

The town was protected against smallpox better than the villages judging by vaccination rates.



D. For fertility and survival direct standardisation was used to examine the births and deaths.

The Crude Birth rate and General Fertility rates are higher for Lunsar than for the villages, but on standardisation, Lunsar is found to have fewer expected births per females than the villages. This is supported by an examination of family size, i.e., number of live born children to women of completed fertility, when it can be shown that the mean family size for Lunsar is 4.7 compared with 5.6 in the villages. The Multiple Pregnancy rate for Lunsar is slightly higher than for the villages.

Taking sterility to mean married for seven years or more without a pregnancy, the sterility rate for Lunsar is lower than for the villages.

The Infant Mortality and Stillbirth rates for the town are lower than for the country but the Abortion rate per 1,000 pregnancies was higher in Lunsar.

The Infant deaths - Toddler deaths ratio is more favourable in Lunsar.

E. In the field of Public Health activity one village had a resident midwife and one a Health Assistant, otherwise there were no medical services. By contrast Lunsar has the Marampa Mines Health Centre, a modern hospital, available for entitled personnel, i.e., those employed in industry and their dependants, and the Roman Catholic Hospital at Mabesene, available for all.

In addition, there is the Lunsar Health Centre staffed by a Dispenser and his assistant, a Midwife, and her assistant, and the Health Inspector and his team who supervise general sanitation. The Endemic Diseases Control Unit of the mines carries out residual spraying with D.D.T. in Lunsar and anti-malarial work in the mining concession area, which is contiguous with Lunsar.

In comparison with the villages the town is well off for medical and public health services.

As a result of these studies it may be stated that for Africans of the same tribal groups, the effect of urbanisation is favourable for the viability of the population, for the physical environment and in morbidity experience for the conditions studied.

Fewer births occur in the town and family size is reduced enabling better care to be given to children which is reflected in the reduced infant and toddler mortality in the town.

The town benefits from medical and public health activities which are absent or minimal in the villages.

Thus the effect of urbanisation on health is favourable in this mining area of Sierra Leone, in most important and relevant respects.

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Appendices

1. Project Report
2. List of Health Institutions
3. Marriage Register, District of ...
4. Age Assessment. ...
5. Social Record ...
6. Records of ...
7. Register of ...
8. ...
9. ...
10. Clinical ...
11. Household ...
12. Clinical ...
13. Administration ...
14. Registration of ...
15. ...
16. Laboratory ...
17. List of ...
18. ...
19. ...
20. ...
21. Dietary ...
22. Infant Feeding ...
23. ...
24. ...
25. Medicine and ...

**APPENDICES**



Appendices

1. Project Time-Table.
2. List of Health Indicators.
3. Marampa Meteorological Record. Mean for years 1956-58.
4. Age Assessment. Digital Preference.
5. Burial Record Book, Marampa-Masimera Chiefdom. 1957-58.
6. Returns of Out-patients treated at Lunsar Health Centre 1957-58.
7. Register of Births, Marampa Mines Health Centre. 1953-58.
8. Pilot Clinical Schedule.
9. Lunsar Census forms A and B.
10. Clinical Schedule Form, Lunsar.
11. Household Schedule. Lunsar and Villages.
12. Clinical Schedules Form. Village Survey.
13. Administration in the Protectorate of Sierra Leone.
14. Estimation of the Population in the Protectorate of Sierra Leone.
15. Sierra Leone Weights and Measures.
16. Laboratory Methods.
17. List of Foods Available in Lunsar Market, July, 1959.
18. Rural Economy. Agricultural Cycle.
19. Crops.
20. Animal Husbandry and Fishing.
21. Dietary Habits.
22. Infant Feeding Methods.
23. Native Medicine.
24. Glossary of Temne words used in Medicine.
25. Medicine and Anthropology.

APPENDIX 1

Project Time-Table

October, 1958 - April, 1959. Preliminary studies carried out in Edinburgh and preparations for field work made.

Part I

9th May, 1959. Arrived in Freetown, Sierra Leone.

Contacts were made with all persons who might be interested or involved in the project in Freetown. Later this was extended to Lunsar, Marampa and Port Loko, the District Headquarters. Full explanations were given to persons concerned as to the purpose and method of the project. This was necessary to gain co-operation and to dispel any idea that the work might be detrimental to Government, or Native Administration or to the Sierra Leone Development Company. Important persons in the Lunsar area were informed that the survey would be purely for health reasons and not connected in any way with taxation or military recruitment.

13th May, 1959. Visited Lunsar to make arrangements.

20th May, 1959. Established in Lunsar.

Documentation collected from local sources. Patients were seen since arrival in Lunsar. It was arranged that these should be referred to the author by the Dispenser. This was done to fulfill a need, as there was no other doctor in the area except at the Marampa Mines Health Centre, to gain confidence of the people and to meet at first hand the day to day sickness of the town both in my clinic and in

the homes of the Africans.

12th June, 1959. Registers of Births and Deaths and Burial Record Book copied. Provisional Clinical Schedule tried out on 12 children attending the Lunsar Health Centre. This brought out defects in the Schedule both in arrangement and content. It also emphasised the need for proper sampling techniques and thus a Sample Census became necessary. Sickness data for patients at Lunsar Health Centre collected.

16th June, 1959. Mapping for Sample Census commenced, completed by 25th June, 1959.

31st July, 1959. Organisation and completion of 10% Sample Census of Lunsar.

Birth weights of African babies extracted from records at Marampa Mines Health Centre by courtesy of Dr. J. Cooper.

20th August, 1959. Strike at Marampa mines. It was considered prudent to suspend all work during this period in order not to give the Africans the impression that we were in any way involved in the affair which was a struggle for power within a trade union.

26th August, 1959. Health Survey of Lunsar commenced, using new clinical schedule.

7th November, 1959. Health Survey completed. Foods available in Lunsar market listed with prices.

Local history from notables of the district. Documented the town photographically.

10th - 11th November, 1959. Investigation on mentally and physically disabled in Lunsar.

12th November, 1959. Clinic held at Romende village.

19th-20th November, 1959. Onchocerciasis survey of Marampa Mines personnel.

21st November, 1959. Clinic held at Foradugu village.

27th November, 1959. Left Lunsar for Freetown.

1st December, 1959. Left Freetown by air for U.K.

January - December 1960. Collected data extracted and arranged, and preliminary report circulated entitled "A Method of Assessing Health Status in an African Community, and its Application in Estimating the Effect on Health of Urbanisation".

Preparations made for second phase of field work in the villages. It was essential that the village surveys should take place in the dry season in view of the difficulties of transportation during the rainy season.

## Part II

Departure from Edinburgh, 26th December 1960, by air and arrival in Freetown on 27th December, 1960.

Contacts renewed with all interested persons, and transport, drugs, licences, etc. organised.

3rd January, 1961, arrived at Marampa and stayed at Sierra Leone Development Company's Compound. Made contacts in Marampa and Lunsar and organised the team

for field work.

5th January, 1961, explored villages for selection for study. Prepared schedules.

9th - 26th January, 1961, mapping, collection of data and reading of blood films for Masimera.

27th - 29th January, 1961, visited villages to make further selection.

30th January - 21st February, 1961. Work at Kamasundu.

22nd February - 28th February, 1961. Work at Mawulay-Mamanso.

4th March - 19th March, 1961. Work at Foradugu.

20th March, 1961. All villages visited and supplementary data collected.

22nd - 23rd March, 1961. Visit to Tonkolili valley to see Simulium control.

24th March. Extracted Infant Deaths and Births for Freetown.

28th March, 1961. Visit to Kontakuma to give treatment to villages.

31st March, 1961. Departure from Sierra Leone for U.K.

APPENDIX 2

HEALTH INDICATORS

List modified from W.H.O. Technical Report Series No.137  
(1957)

I. INDICES OF VITALITY AND HEALTH

A. Demography

1. Population, give maps of distribution.
2. Density of population, occupation, social organisation.
3. Composition of population, by age and sex. Family size.
4. Birth rate. Illegitimacy rate.
5. Fertility rates, married and illegitimate.

B. Mortality

6. Maternal mortality rate.
7. Stillbirth rate.
8. Infant mortality rate.
9. Neonatal mortality rate.
10. Mortality due to communicable diseases, e.g., smallpox, malaria, tuberculosis.
11. Other specified causes of death, e.g., accidents.
12. Proportional mortality ratios. (1) Toddler/Infant Mortality Ratio (2-5 yrs./Infants)  
(2) Proportional mortality of 50 years and above.
13. General mortality rate.
14. Expectation of life at 1 year.

C. Morbidity

15. Apparent morbidity and case fatality from communicable diseases.
16. Tuberculosis.
17. Venereal diseases.
18. Sickness rates, absenteeism from school or work.  
Spleen rates.  
Parasite load.
19. Accident rates.
20. General State of health of the population, including nutrition.
  - (a) Heights and weights for each age and sex.
  - (b) Haemoglobin estimations by age and sex.
  - (c) Dental state. D.M.F. rates.
  - (d) Special groups, e.g., mineworkers, schoolchildren, students, military and police recruits.

- (e) Birth weights of infants as an index of maternal nutrition.
  - (f) Nutritional assessment of diets.
21. Mental Health, suicides, homicides, delinquency, drug addiction, alcoholism.  
First admissions to mental hospitals.  
Mental health in detribalised children.

## II. INDICES OF ENVIRONMENT

### External Environment

#### A. Meteorology

22. Meteorological information concerning temperature, rainfall, sunshine, etc.

#### B. Housing

23. Type of dwelling.  
24. Overcrowding. Family living conditions.  
25. Newly built or improved dwellings.  
Maps will be used to illustrate these conditions.

#### C. Sanitation

26. Disposal of excreta. The extent to which any facilities are used.  
27. Water supply. Number of persons using different types of supply.  
28. Killing of insect pests.

#### D. Consumption

29. Food consumption, adequate in calories and protective factors.  
30. Alcohol consumption of different types.

### Social Environment

#### A. Occupational Environment

31. Occupations and social organisation.  
32. Distribution of gainfully-occupied population.  
33. Agricultural utilisation of the soil.  
34. Size of holdings.  
35. Crops  
36. Livestock

- 37. Industry.
- 38. Urbanisation rates, i.e., ratio of population residing in towns of given size to total population of country.

B. Communication and Electrification

- 39. Means of communication.
- 40. Electrification.

C. Education

- 41. Cultural level.

III. INDICES OF PUBLIC HEALTH ACTIVITIES

A. Personnel and Equipment

- 42. Medical and auxiliary professions. Extent to which services are used.
- 43. Clinics and health centres, mobile clinics.
- 44. Hospital institutions. Number of beds per head of population.
- 45. Rate of hospital attendance =  $FH$  = annual number receiving attention in hospitals per 1,000 inhabitants.

B. Medico-Social Activity

- 46. Health instruction.
- 47. Maternal and infant health services.
- 48. Health services for children.
- 49. Industrial hygiene.
- 50. Control of special diseases.
- 51. Active immunisation, vaccinations and inoculations.
- 52. Laboratory work.
- 53. Food inspection and control, veterinary services.

C. Social Welfare

- 54. Health insurance.
- 55. Public medical assistance.
- 56. Social protection and relief of mothers and children.
- 57. Relief of the aged.
- 58. Unemployment and relief of unemployed.



APPENDIX 3

Marampa Meteorological Record, Sierra Leone. Mean Readings 1956-58

Month	TEMPERATURE			RELATIVE HUMIDITY %		RAIN FALL
	Mean Daily Maximum °F	Mean Daily Minimum °F	Extreme Daily Variation	9 a.m.	2 p.m.	Total in Inches
January	91.6	67.2	24.5	84.5	50.0	0.06"
February	93.7	70.8	22.9	88.5	48.3	0.14"
March	94.3	70.9	23.6	82.9	49.6	2.83"
April	93.6	72.6	20.9	80.7	54.0	5.35"
May	91.9	72.1	19.2	85.4	64.9	8.67"
June	87.7	73.4	13.6	89.9	79.2	11.24"
July	83.5	71.3	12.5	91.9	78.6	16.13"
August	83.4	71.3	12.0	91.6	80.6	15.30"
September	86.2	72.4	13.6	92.0	75.8	18.66"
October	88.1	71.2	16.8	90.5	69.9	15.70"
November	87.8	71.5	16.3	88.8	70.1	10.85"
December	87.7	68.9	18.8	91.7	69.3	2.08"

TOTAL 107.01"

Mean Annual  
Rainfall = 107.01"

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APPENDIX 4.

AGE ASSESSMENT

Digital preference. Frequency of various ending digits for women over 15.

	0	1	2	3	4	5	6	7	8	9
Lunsar	24	10	4	1	3	38	21	4	15	2
Masimera	22	2	5	6	8	14	9	4	9	4
Kamasundu	19	2	7	16	11	27	15	9	20	5
Mawulay-Mamanso	13	2	2	4	5	5	1	2	10	1
Foradugu	21	2	10	6	10	10	15	9	5	3
TOTAL	99	18	28	33	37	99	55	24	74	15

Digital preference. Frequency of various ending digits for males over 15.

	0	1	2	3	4	5	6	7	8	9
Lunsar	17	4	8	9	6	27	9	8	21	10
Masimera	8	1	1	1	4	15	6	6	9	5
Kamasundu	13	3	6	6	7	20	3	5	17	4
Mawulay-Mamanso	4	-	4	2	1	8	2	3	2	1
Foradugu	4	1	7	1	3	8	1	5	8	1
TOTAL	46	9	26	19	21	78	21	27	57	21

APPENDIX 5.

Burial Record Book. Lunsar

These records are kept by the Sanitary Inspector, and indicate the number of burials in Moslem and Christian cemeteries in Lunsar.

	1957	1958
January	10	6
February	10	9
March	11	7
April	4	10
May	8	6
June	8	7
July	8	5
August	5	11
September	14	11
October	7	9
November	8	7
December	3	7
	96	95
Males	49	46
Females	47	49
Ages generally not stated		
Children	49	48
Adults	47	47
	96	95

APPENDIX 6.

Return of Outpatients treated at Lunsar Health Centre  
Jan-Dec. 1957.

New Cases		Subsequent Attendances		Total Attendances	
<u>M</u>	<u>F</u>	<u>M</u>	<u>F</u>	<u>M</u>	<u>F</u>
3577	3284	7984	8126	11561	11410

1. Malaria	906	7. Helminth Infections	607
2. Yaws	113	8. Skin Diseases	492
3. Syphilis	NIL	9. Ulcers	755
4. Gonorrhoea	99	10. Wounds	286
5. Dysentery and Diarrhoea	464	11. O.D. Digestive tracts	927
6. Respiratory Diseases	1204	12. O.D. Bones and cell diseases	544
Births:		13. Other Diseases	464
M - 71	F - 53		

TOTAL 6,861

Report: General attendance satisfactory throughout the year.

(sgd.) D.C. Algali  
Medical Dispenser.

Return of Outpatients treated at Lunsar Health Centre  
Jan-Dec. 1958.

New Cases		Subsequent Attendances		Total Attendances	
<u>M</u>	<u>F</u>	<u>M</u>	<u>F</u>	<u>M</u>	<u>F</u>
3829	3296	10188	10257	14017	13553

Principal Causes of Attendance

1. Malaria	421	7. Helminth Infections	676
2. Yaws	108	8. Skin Diseases	406
3. Syphilis	NIL	9. Ulcers	1136
4. Gonorrhoea	144	10. Wounds	372
5. Dysentery and Diarrhoea	449	11. O.D. Digestive tract	914
6. Respiratory Diseases	1380	12. O.D. bones and Cell diseases	507
Births:		13. Other Diseases	619
M - 45	F - 54		

TOTAL 7,132

Report: General attendances satisfactory throughout the year.

(sgd.) D.R. Algali  
Medical Dispenser.

APPENDIX 7.

REGISTER OF BIRTHS 1953 - 1958

Marampa Mines Health Centre

	Total	Normal	Forceps	Caesar	Stillborn	Twins	Males	Females
1953	6	3		3	NIL	NIL	2	3
1954	17	9	1	3	4	M & F	4	11
1955	47	32	3	9	3	M & F M & F	24	13
1956	41	32	NIL	8	1	NIL	15	19
1957	99	75	3	16	5	M & M M & M F & M M & M F & M F & F	53	46
1958	92	69	2	13	8	M & M M & F M & M	54	38
	302	220	9	52	21	12	152	130

Stillbirth Rate is 65/1,000 live and still births

Sex Ratio at Birth: 116.9 liveborn males to 100 liveborn females.

APPENDIX 8. Pilot Clinical Schedule.

HEALTH SURVEY OF CHILDREN 0 - 5 YEARS IN  
SIERRA LEONE

SECTION I

Index Number  
Date

TOWN                      DIVISION  
DISTRICT                  VILLAGE  
TRIBE    Mende  
          Temne  
          Other

AGE

ESTIMATED

STATED

NAME

BIRTH  
RANK:

WHERE BORN: AS ABOVE  
                  TOWN  
                  COUNTRY

BAPTISM RECORD      AVAILABLE  
                          NOT AVAILABLE

HEIGHT    CMS.  
BIRTH     CMS.

WEIGHT. GRAMMES.  
BIRTH WEIGHT. GRAMMES.

CHILDS OCCUPATION    NONE  
                          SCHOOL  
                          WORK

HAS CHILD VISITED    DOCTOR  
                          NURSE  
                          CLINIC  
                          HOSPITAL

PHYSICAL EXAMINATION OF CHILD

SECTION II

SKIN: PRESENT ABSENT

YAWS INFECTIVE  
NON-INFECTIVE

SCABIES

LICE

TROPICAL ULCER

EPIDERMOPHYTOSIS

OTHER CONDITIONS

VACCINATION SCAR

<u>SPLEEN</u>		<u>LIVER</u>	
	0		0
	1		1
	2		2
	3		3
	4		4
	5		5

NUTRITION PRESENT ABSENT

EYES PHOTOPHOBIA  
EXCESS LACHRYMATION  
DRY CONJUNCTIVA  
TRACHOMA  
CORNEAL DAMAGE

HAIR NORMAL  
THIN  
STARING  
RED

MOUTH CHEILOSI  
ANGULAR STOMATITIS

TONGUE PAPILLAE LOST PRESENT ABSENT  
GLOSSITIS  
FISSURES

SKIN	CRAZY PAVING DERMATOSIS DEPIGMENTED LOSS ELASTICITY XEROSIS FOLLICULAR HYPERKERATOSIS	PRESENT	ABSENT
------	---	---------	--------

OEDEMA	LEGS ABDOMEN		
--------	-----------------	--	--

REFLEXES	KNEE JERKS ANKLE JERKS		
----------	---------------------------	--	--

SQUATTING TEST		POSITIVE	NORMAL
	CALVES	TENDER	NORMAL

<u>THYROID</u>		ENLARGED	NORMAL
----------------	--	----------	--------

<u>BLOOD PRESSURE</u>	SYSTOLIC mmHg		
	DIASTOLIC mmHg		
	NOT TAKEN		

<u>URINE</u>	SUGAR ALBUMEN	PRESENT	ABSENT
--------------	------------------	---------	--------

<u>BLOOD</u>	THICK FILM	P. VIVAX P. MALARIAE P. FALCIPARUM OTHER PARASITES NOT TAKEN	PRESENT	ABSENT
--------------	------------	--	---------	--------

	HAEMOGLOBIN	GMS/100 ml.	
	NOT TAKEN		

<u>TUBERCULIN TEST</u>	MORO	PERFORMED	POSITIVE	NEGATIVE	NOT
5 T.U. seen after 72 hrs.	MANTOUX				EXAMINED

<u>STIGMATA OF</u> <u>MENTAL ABNORMALITY</u>		PRESENT	ABSENT
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FAMILY DATA

SECTION III

CHILD IN CHARGE OF: MOTHER  
FATHER  
SIBLING  
GUARDIAN  
RELATIVE

OCCUPATION OF GUARDIAN: WORK IN HOUSE  
IN FIELDS  
IN MINE  
OTHER

AGE OF MOTHER 15 - 20  
21 - 30  
31 - 40  
41 +

MOTHER DEAD

NUMBER OF CHILDREN BORN TO MOTHER

NUMBER ALIVE

NUMBER BORN DEAD

WHAT AGE WOULD BE NOW IF DEAD CHILDREN HAD SURVIVED

MALES

FEMALES

MOTHERS STANDARD OF EDUCATION

READ

WRITE

SCHOOL STANDARD

ADVANCED

FATHER OF CHILDREN: ONE FATHER  
TWO FATHERS

THREE FATHERS  
MORE THAN 3

CARE OF CHILD: MOTHER ALL DAY  
MOTHER PART TIME

OTHER CHILDREN  
OTHERS

MOTHERS ROLE: LOOKS AFTER CHILDREN  
COOKS  
SHOPS  
OTHER WORK



FORM B Sector and House Number

Surname	Names	Sex	Age	Relation to head of House	Civil State	Birth place	Tribe	Lang-uages	Literacy	Religion	School	Occupation	Industry	Status	Did this person make pro-duct in own house for sale or barter	Is person unem-ployed	Length Resid-ence Lunsar
1																	
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	
19																	
20																	
21																	
22																	
23																	

Status  
 Employ-  
 er Own  
 account  
 (O.A.)  
 Employ  
 ee  
 unpaid-  
 family-  
 worker  
 (U.F.W.)  
 or  
 barter

APPENDIX 10.

HEALTH SURVEY

SIERRA LEONE 1959

Name			Index Number
Address			Date
Age	Sex	Occupation.	
Tribe			Religion
Birthplace			Duration of stay in present place
1. Height cms.			2. Weight gms.
3. Hair Hypochromtriohia.			
4. Eyes.			
5. Lips. Cheilosis			
	Angular Stomatitis		
6. Tongue. Glossitia			
	Fissured		
	Geographic		
7. Gums (separate form).			8. Teeth (separate form).
9. Bones . Bossed Skull			
	Beaded Ribs.		
	Bow Legs		
10. Skin. Xerosis			Folliculosis
	Depigmented		Ulcers
	Loss elasticity		Scars (incl. Vaccination)
11. General: Oedema			Subcutaneous nodules
	Reflexes		
12. Spleen 0			Liver 0
1			1
2			2
3			3
4			4
5			5
13. Blood Film. Malaria			
	Other Parasites.		
14. Skin snip. Onchocariasis.			
15. Haemoglobin.			
16. Blood pressure.			
17. Urine Glucose			Albumen.
18. Tuberculin Test. Performed. Positive.			Negative
19. Herniae.			Not seen
20. Current Illness			
	Disability		
	Defect.		

For Females 15 years and over:

a. Number of children born alive,	males	females	total
b. Number of children living now,	males	females	total
Give Ages			
c. Number of children born dead,			
d. Ages at which children died,	males	females	
e. Number of multiple pregnancies.			
f. Number of foetal deaths.			



Name: Index Number:

Address: Date:

Sex: Age: Birthplace:

CIVIL STATE

- Single
- Married
- Widowed
- Divorced or Separated

OCCUPATION

- House
- Farmer
- Trader
- Industry
- School. Attended
- Arabic only

TRIBE

- Temne
- Mende
- Fulah
- Limba
- Creole
- Other

RELIGION

- Muslim
- R.C.
- Protestant
- Pagan

LITERACY

- Literate
- Arabic

NUTRITION

Hair	Hypochromotrichia	Teeth	DMF	
Eyes		Gums		
Lips	Cheilosis Angular Stomatitis		Tongue	Glossitis Fissured Geographis
Bones	Bossed skull Beaded ribs Bow legs			
Skin	Xerosis Depigmented Loss elasticity Folliculosis	Ulcers		
		Scars vaccination Other		

MALARIA

Blood Film:	Spleen	0
Plasmodia		1
Gametocytes		2
Other parasites		3
		4
		5

Haemoglobin%

ONCHOCERCIASIS

Skin snip		
Subcutaneous nodules	Site	Number

HERNIA

Umbilical Other

COMPLAINS OF: Current illness

Sight: Question - "Can you see well?"

V.D.: Question, males only - "Have you had venereal disease?"

FERTILITY AND SURVIVAL

For Females 15 years and over:-

1. Number of children born alive

	Males	Females	Total
--	-------	---------	-------

Birth Rate  
Fertility Rate

2. Number of children born alive since this time last year

	Males	Females	Total
--	-------	---------	-------

Still Birth  
Rate

3. Number of children born dead since this time last year

	Males	Females	Total
--	-------	---------	-------

Infant  
Mortality  
Rate

4. Number of children born alive since this time last year  
who have died within this year

	Males	Females	Total
--	-------	---------	-------

Neonatal  
Mortality  
Rate

5. Number of children born alive since this time last year  
who died before they were one month old

	Males	Females	Total
--	-------	---------	-------

Ago specific  
Death Rate

6. Ages at which children died

	Males	Females	Total
--	-------	---------	-------

7. Number of multiple pregnancies

8. Number of abortions

9. Number alive at this time:

	Males	Females	Total
--	-------	---------	-------



APPENDIX 13.

Administration in the Protectorate of Sierra Leone.

The Protectorate is divided into 12 administrative districts each in charge of a District Commissioner, which are administered by Provincial Commissioners to whom the District Commissioners are directly responsible. Separate villages are combined to form the extended village or Section and a number of Sections constitute a Chiefdom which is the principal administrative unit. There were 147 Chiefdoms at the end of 1958 each being in charge of a Paramount Chief, who is elected and assisted by an advisory council known as the tribal authority or Native Administration. This is composed of section chiefs and sub-chiefs and headmen of the larger villages together with a number of elders, and of representatives of the tax payers.

The Native Administration levies a tax, and, with the addition of court fees and fines, together with any other fees ordinarily personally paid to the chief, receives such revenue out of which the chief and other officials are paid fixed stipends.

The two Chiefdoms in which the village surveys were undertaken were Marampa-Masimera with an area of approximately 410 square miles and Buya Romende with an area of approximately 183 square miles.

APPENDIX 14.

Estimation of the Population in the Protectorate of Sierra Leone.

Local tax is levied in the Protectorate by local authorities at a rate of 25 shillings per year, on every adult male.

The tax is administered by the Native Administration. There is a considerable amount of avoidance of payment of this tax. When the Clerk to the Native Administration, accompanied by the Court Messengers or Chiefdom Police arrive in an area to collect the tax, many adult males leave the region and do not return until the tax collectors have moved on. The numbers of adult males paying tax is thus probably less than the true population of adult males for that area.

The numbers of male tax-payers for 1959 are given in the Protectorate Handbook, 1960.

Port Loko District:	<u>Number of Tax-payers</u>	<u>Estimated population</u>
Buya Romende Chiefdom (area 183 square miles approx.)	5,404	37,828
Marampa-Masimera Chiefdom (area 410 square miles approx.)	6,580	46,060

In order to estimate the population, the District Commissioners arbitrarily multiply the number of male tax-payers by seven, as in the above example.

The Tax Lists of the Marampa-Masimera Chiefdom were made available to me, by the courtesy of Mr. M. Sankoh, and the numbers of tax payers for Kamasundu and Foradugu by the courtesy of Mr. E.M. Garber. These two gentlemen are Clerks to their respective Native Administrations.

Comparison of Populations from Tax and Survey Data

Name of town or village	Number on Tax Lists	Estimated Population From Tax Lists	Estimated Population from House Lists	Actual Population
Masimera	30	210	233	239
Mawulay - Mamanso	16) 10) 26	182	156	129
Foradugu	106	742	531	556
Kamasundu	90	630	381	371
Lunsar	1742	12194	Sample Census 954 x 10 = 9540	-

It will be seen from the above figures that the Administrations estimate for the population is an over-estimate for all except Masimera. There does not appear to be a constant factor which could be used with accuracy.

The detailed list of the numbers of taxpayers in the different sections of Lunsar are given in the following table.

Lunsar, showing number of Tax payers, 1960, by district

<u>LUNSAR</u>	<u>NUMBER OF TAXPAYERS</u>
Pathbana	206
Robis	237
Mamanso	220
New Town	227
Limba Town	233
Old Town	256
Mabai	258
Four Roads	105
	1742

1742 x 7 = 12,194 Estimated population (see Protectorate handbook, 1960).

Sierra Leone 'bushel' is, therefore, considerably greater than the Imperial bushel. It does not even refer strictly to the older 'Colonial' bushel used up to 1949, but to the weights of the lots in which commodities are traditionally traded.

The following tables contain most of the Sierra Leone measures.

Local Measures of Volume

- 1 cigarette cup or tin = 250 c.c.
- 4 cigarette cups
- 2 penny pint
- 3 threepenny pints
- 2 bottles
- 2 cans of wine
- 1 penny pint
- 2 threepenny pints
- 1 bottle (21 lb. glass)
- 1 can of wine
- 'bushel' (40 lb. glass)

APPENDIX 15

SIERRA LEONE WEIGHTS AND MEASURES

The sale of local produce in native markets is almost invariably done by volume. Standard containers which can be readily obtained are used, the commonest being the cigarette tin (cup) and the beer bottle. Larger measures are the four-gallon kerosene tin, and the kerosene case, which held two tins. These are no longer readily available since fuel is now principally supplied in 44-gallon drums or in bulk.

Certain measures became standardised by usage for the major agricultural commodities. The average weight of a kerosene case, heaped up until no more stayed on, was taken as the basis for the 'bushel' weight. The Sierra Leone 'bushel' is, therefore, considerably greater than the Imperial bushel. It does not even refer strictly to the older 'Colonial' bushel used up to 1900, but to the weights of the lots in which commodities are traditionally traded.

The following tables contain most of the Sierra Leone measures.

Basic Measures of Volume

1 cigarette cup or tin = 250 ml.	
4 cigarette cups	1 penny pan
2 penny pans	1 threepence pan
5 threepence pans	1 kettle (21 lb. clean rice)
2 kettles	1 can or tin
2 cans or tins	1 'bushel' (84 lb. clean rice) = 36.4 litres.

Standard nett weights per bag

cocoa	140 lbs.
coffee	132 lbs.
ginger	212-235 lbs.
groundnuts (undecorticated)	77 lbs.
palm kernels	182½ lbs.
rice (clean)	168 lbs.
rice (paddy)	120 lbs. (often 150 lbs)

'Bushel' weights

benniseed (sesame)	60 lbs.
chillies (dried peppers)	28 lbs.
groundnuts (undecorticated)	36 lbs.
guinea corn	84 lbs.
kola nuts ('measure' - 8 kettles)	176 lbs.
maize	72 lbs.
palm kernels	60 lbs.
rice (clean)	84 lbs.
rice (paddy)	60 lbs.

Miscellaneous Measures

'bundle' of piassava	56 lbs.
bottle-reputed quart	1/6th gallon.
bottle-reputed pint	1/12th gallon.
cigarette cup = 250 ml.	8 to 9½ oz. of rice
kettle (clean rice) = 9.1 litres = 1 peck	21 lbs. (2 gallons approx).
tin (or can):	4 gallons
of honey	48 lbs.
of palm oil	38 lbs.
box (rice)	84 lbs.

## APPENDIX 16

### Laboratory Methods

#### Blood films:

Thick films were made from blood taken from the finger or toe in the case of infants.

These were examined wet for microfilaris. The film was then dried and subsequently stained with Giemsa in a solution made up of 15 drops of stain with 15 ml. of distilled water. The slide was then washed in distilled water and allowed to dry.

The blood film was read for 10 minutes.

All blood films were taken during the day.

#### Skin snip:

Skin over the outer side of the leg in the region of the knee was raised on the point of a needle and snipped off with sharp scissors. The piece of skin was teased out in normal saline and examined under low power for microfilaria of *Onchocerca volvulus* which were identified characteristically freeing themselves from the edge of the skin.

#### Blood Pressure Recording:

1. These were taken with a Mercury Sphygmomanometer.
2. Systolic reading - appearance of the first sound when cuff is deflated slowly.
3. Diastolic reading - point at which sound becomes muffled and begins to fade.

4. Two sets of readings only were taken and the second reading was recorded.
5. The readings were always taken with the subject in the sitting position.

Weight Recording:

Two specially designed steelyard scales were used. These were modified butchers steelyard scales calibrated in kilograms and grams and designed so that the apparatus could be slung from a beam or tree.

The larger scales had a sling seat on which the subject sat, and the smaller scales had a cradle for use of infants. All weights were measured and recorded by the author.

Height Recording:

This was done with a specially designed measuring rod calibrated in centimetres. The upright bar was fixed onto a solid wooden base on which the subject stood and a sliding bar at right angles recorded the height. All measurements and recordings were made by the author.



APPENDIX 17.

LIST OF FOODS AVAILABLE IN LUNSAR MARKET

July 1959.

Foods are arranged in the same order as in the "Tables of Representative Values of Foods commonly used in Tropical Countries". M.R.C. Spec.Rep. Ser.No. 253, 1945. London. H.M.S.O.

1. Cereals and Starchy Roots, Fruits, etc.

(a). <u>Cereals</u>	<u>Temne Name</u>	<u>Proper names</u>		
Bread	kabo		½ lb.	6d.
Maize	tamank	Zea mays Lin	1 cob	1d.
Rice	apla	Oryza sativa Linn	1 cig. tin	9d.
Maize meal	tamank te gbim		1 tied leaf	2d.
Wheat flour	kabo ke gbim	Sorghum vulgare	1 cig. tin	9d.
Millet	epaini	Pennisetum typhoides Staff & Hubbard		

(b). Starchy Roots, Fruits, etc.

Cassava	euka	Manihol utilissima Pohl	½ lb.	6d.
Ginger	tessinger	Zingiber officinalis Rox	¼ lb.	1d.
Potatoes African	emuna	Ipomeoa batatas Lam	¼ lb.	1d.
Potatoes Irish	emuna opoto	Solanum tuberosum Linn	1 lb.	3.6d.
Cocoyam (taro)	berone	Colocasia, alocasia and Xauthosoma spp. Dioscorea spp.	4 large	6d.

2. Legumes

Beans in leaves	akeyri	Phaseolus Mungo	1 bundle	1d.
Locust bean	tabae	Ceratonina siliquo Linn	1 bundle	1d.
Soya		Glycine max(Linn) Merr.		

3. Oil Seeds and Nuts

Kola nut	hakola	Cola acuminata Schott and Endl	1	1d.
Avocado	hanpia	Persea americana Mill	1	2d & 3d.
Ground nuts	makand	Arachis hypogaea Linn	1 cig. tin	5d.
Coconuts	kagbarra	Cocos nucifera Linn	1	3d & 6d.
Sesame, Benniseed		Sesamum orientale or indicum		

Temne Name                      Proper Names

4. Vegetables

(a). Leafy, Green and Yellow

Peppers green & red	gbengbeh	Capsicum annum Linn	$\frac{1}{4}$ lb.	ld.
Onions	yaba	Allium fistulosum Linn	1	ld.
Green leaves	kreenkreen		1 bundle	ld.
Potato leaves	kamuna		1 bundle	ld.
Cassava leaves	kayuka	Manihot utilissima Phol.	1 bundle	ld.
Okra (ladies fingers)	maluntu	Hibiscus esculentus Linn.	$\frac{1}{2}$ lb.	ld.
Beans	elaile		$\frac{1}{2}$ lb.	ld.
Small beans	okunshu		$\frac{1}{2}$ lb.	3d.
Pumpkins	skall	Curairbita spp.	1	3d.

(b) Other

Egg plant	ambela, ankobo	Solanum	$\frac{1}{2}$ lb.	3d.
Tomato	matamba	Melongera Linn	$\frac{1}{4}$ lb.	3d.

5. Fungi and Yeasts

Hycopersicum  
esculentum Mill

6. Fruits.

Pineapples	ananas	Ananas comosus Linn	large	6d.
Bread fruit	berefoot	Artocarpus communis	1	2d.
Orange	alimeray	Citrus sinensis Forst	1 large	ld.
Soursop	hangsawasap	Annona reticulata Linn	1 large	9d.
Guava	guava	Psidium guajava Linn	4	3d.
Mango	mankoro	Mangifera indica Linn	1	ld.
Banana	ambana	Musa sapientum linn	6	ld.
Plantain	heplantine	Musa paradisiaca Linn	1	3d.
Papaya	kapapai	Carica papaya Linn	1 small	4d.
Lime		Citrus aurantiifolia Swingle	1	2d.

7. Stems

Sugar cane	kagbuka	Saccharum officinarum Linn	1 fathom	1.0d.
------------	---------	-------------------------------	----------	-------

	<u>Temne Name</u>	<u>Proper Name</u>		
<b>8. <u>Fats &amp; Oils</u></b>				
Red palm oil	amarou	Elaeis guineensis	1 large	
		Jacq		
Kernel oil	ambonto	Var.dura	beer bottle	1.6d.
<b>9. <u>Animal Products (except Fats)</u></b>				
<b>(a) <u>Fish and Fish Products</u></b>				
Large fish (sea)	gbampor		1	6d.
Small fish (sea)	bonga #	Ethmalosa fimbriata	1	6d & 9d.
	kalath		½ lb.	3d.
Big river fish	katapong		1 lbs.	1.9d.
Shrimps	kasamp		1 cig.	3d.
			tin	
Fish	elope		1	4d.
<b>(b) <u>Insects</u></b>				
<b>(c) <u>Meat, Meat Products &amp; Eggs</u></b>				
Meat	osem		1 lb.	3.3d.
Meat filet			1 lb.	3.6d.
Eggs	emess		1	4d.
Goat	oyir		1 lb.	2.6d.
Chicken	ontoko		small	5.0d.
Duck			small	8.0d.
Snails				
Squirrels				
Bush rats				
Small deer				
<b>(d) <u>Milk and Milk Products</u></b>				
Cows milk	manono		small can	2d.
			full	
<b>10. <u>Condiments and Spices</u></b>				
Salt	amerr		cig. tin	2d.

Temne Name      Proper Name

11. Syrups, Sugar and Preserves

12. Beverages.

Coffee	okofi	cig. tin	6d.
Tea	antee	small packet	1d.
Palm Wine	makomp, mabir	1 large beer bottle	2d.

\* large shoals are found in shallow coastal waters at certain seasons of the year, caught by cast nets worked from large dug-out canoes. Other methods are beach seine nets, hand lines, fish ponds or fences.

The following baby foods are available in Lunsar shops:-

Klim	Semolina
Ostermilk	Tinned milk, Nestles, Dutch, etc.
Cow and Gate	Farex
Lactogen	Quaker Oats
Glucose	Ribena
Ovaltine	Custard.
Cornflour	

Mothers ask advice from Lebanese about baby care and feeding.

APPENDIX 18

The villages live basically on their own agricultural products but certain quantities of rice and palm kernels may be sold. Money gained in this way is used for the purchase of cloth, food, utensils and other articles, many of which are imported from overseas.

There is probably no village in Sierra Leone which does not trade its produce in this way, however small may be the scale.

It is very difficult to find out the quantities of products sold from African villages.

The Africans are naturally reticent about anything concerning money. Also, there is no central clearing house and the Chief is not necessarily informed about sales. Bags of rice might be sold to the local traders such as Foday Fofanah in Masimera, or to an African or Lebanese trader in Lunsar or the rice might be put on a lorry which was going to Freetown and sold there or at any place 'down the line'.

Thus an individual farmer might deal with many merchants for different consignments.

Another complication is added by the fact that some villages, such as Masimera, act as centres for the trade in rice and other products which are brought in from neighbouring villages for transportation along the road.

After enquiry at Masimera, I estimated that about 100 bags of rice and 50 bags of palm kernels would be marketed per week. Rice sold at £3 - £5 per bag (January 1961), palm kernels at £2.16s. -d. per bag, millet at £2.15s. -d. per bag, and ground nuts at £2 per bag. All amounts are given in West African Currency.

From the sale of rice and palm kernels it is calculated that on an average, £400 per week comes into the village, i.e., about £7 per head per month or £84 per head per annum.

#### The Agricultural Cycle

The work programme for swamp and upland rice farming in the four villages studied followed a general pattern. Rice is the principal staple food in Sierra Leone and has been from time immemorial, and other grain crops, which are more popular elsewhere in West Africa, are of little importance. This may be because of the abundance of swamps and wild rice which has been modified and improved by the introduction of new varieties by the early colonists.

The men do the heavy work such as 'brushing', cleaning and digging swamp rice farms and cutting oil palm fruit. 'Brushing' consists of cutting down the bush, both trees and grass, and burning when the material is dry. About a week later the burnt material is collected and burned again and the ash spread over the ground.

In the slack period after the rice harvest, house building, thatching and repairs are carried out.

The women prepare rice, palm oil and coconut oil and extract the kernels from the hard seeds of the oil palms.

Children assist in lighter work but are employed largely in scaring the birds away from the fields when the crop is ripening.

The whole family assists in harvesting, threshing rice, etc.

The agricultural cycle moulds the lives of the villages to a very large extent. Their social behaviour is closely related to this pattern.

#### Monthly Work Programme

January Harvest swamp rice. Cassava and sweet potatoes planted in swamps from which rice has been harvested. Cut special grass for thatching houses.

Harvest millet and guinea corn.

Repair houses

Visits to friends

'Brushing' starts in second half of month.

Bundu and Poro Societies are active training initiates.

February 'Brushing' for upland rice. Rice harvest completed.

Planting of sweet potatoes and cassava.

Oil Palm fruit collected.

March 'Brushing' for upland rice.

Burning the farms and spreading the ash over the ground.

Oil Palm harvest.

Bundu girls return from initiation in the Sande Society.

April Oil Palm, guinea corn, beans, maize, harvest.

Digging of land for upland rice.

Seeding of lawns for swamp rice.

Planting of upland rice. Seed is saved from the previous year.

The rice is scattered first and then the ground is dug to cover the rice with 3 - 4 inches of soil.

May Clearing and digging of land at start of swamp rice cultivation. Sowing upland rice.

Birds are driven away by small boys until the rice germinates.

A watch is kept for small animals so that the rice is not destroyed.

Harvest of cassava and sweet potato

Re-planting of cassava.



- June Digging and preparation of land for swamp rice cultivation continues. Weeding of the rice fields of upland rice. Preparation of land for transplanting rice seedlings.
- July Cleaning of the fields continues. Transplanting of rice seedlings into flooded paddy fields.
- August Cleaning of swamp. Birds are driven away from the paddy. This is the 'hungry season'.
- September Drive birds from the ripening rice. Harvest starts at fringes of swamp rice fields.
- October Drive birds. Harvest coming in. The paddy is tied in bundles and stacked to dry on fields.
- November Harvest upland rice. Rice is removed from fields to the house. Some bring the paddy to the houses, others thresh in the fields. The grain is put into bags bought from traders. Rice is measured by the 'box' (i.e. 84 lbs rice) Rice debts paid, with interest, for those who have taken a loan of rice.

December Harvest swamp rice.

Storage of rice.

Palm Oil harvest.

Guinea corn, beans and maize are harvested.

Plant cassava and sweet potato. Rice may

be sold husked or with the husk which is

cheaper. Rice is parboiled in water and

dried in the sun. The pounding is done when

dry and before cooking.

Visits to friends.

The time of plenty.

Planting of cassava and sweet potato.

APPENDIX 19.

Crops

Cereals: Rice both upland and swamp is cultivated.

Upland farming based on shifting cultivation causes soil erosion and is not encouraged by the Government. Rice is the staple food crop but excess may be sold in Freetown, Lunsar, Makeni or 'along the line'.

The rice is sold in four categories:-

1. Potala - large grained and usually parboiled.
2. Madisi - mixed.
3. Ginette - small grained.
4. Rough - white rice, husked, usually with fractured grains.

Parboiling is treatment with hot water for half to one hour. After allowing the rice to cool in the water it is spread out to dry on the ground. This results in forcing the vitamin B constituent into the grain thus improving its nutritive value. The grain is less brittle after treatment, the percentage of broken grains during milling is reduced, and the rice stores better.

Paddy should not be dried in strong sunshine which tends to produce cracked grains. Milled rice stores badly, milling should be arranged to conform with the rate of consumption. In Sierra Leone all pounding of rice is done immediately before consumption.

Maize, Millet and Sugar Cane are widely grown but only for local consumption. Millet is occasionally sold in small quantities.

Pulses: Various kinds of beans are grown, black grain, soya, cowpea and calabar beans. Most are for local consumption but some calabar beans are exported.

#### Root Crops

Cassava is the second most important staplefood crop, and is grown throughout the area on a considerable scale.

There are bitter and sweet types, morphologically indistinguishable, depending on the amount of glucoside in the roots. Both types can be safely eaten after peeling and cooking.

Sweet potatoes are grown for local consumption. There are many varieties.

Yams are grown on mounds in Sierra Leone and are usually consumed locally.

Cocoyams (taro) are a common food.

#### Oil Seeds:

Groundnuts are grown largely for local consumption but are also marketed outside the district in Lunsar and Freetown.

Sesame, called Benniseed in Sierra Leone, is also grown.

Coconut is distributed throughout the region but is seen in small clumps of trees. There are no plantations in this inland region. No copra is made but coconut oil is prepared and used for cooking.

Oil-palm is the common perennial palm of this region. The variety dura, the normal West African form, has a shell about 30% of the weight of the fruit and a thick pericarp.

The oil palm is monoecious, flowering being characterised by regimes of dominantly male and female flowering periods. Thus the yield of fruit follows a pattern of alternating periods of high and low production. 5 - 10 bunches of fruit are produced by each palm per annum.

The fruit from the bunch is used to make palm oil, the richest known source of vitamin A. The shells are cracked and palm kernels are marketed for export for the manufacture of palm kernel oil.

#### Fruits and Nuts:

Bananas and Plantain are entirely for local consumption.

Citrus fruits are grown abundantly but only Mawulay-Mamanso sells these at Lunsar or Freetown.

The green oranges are peeled, the top cut off, and the contents of the fruit sucked and squeezed out. They do not appear to be eaten in any other way.

Pineapple and breadfruit are grown for local consumption.

Mango and cashew are also seen and at times mango is common. Cashew is considered to be food only for children.

Pawpaw is a small variety and fairly common.

Kola nuts. These are white or purplish red and are consumed locally but certain quantities are marketed and some exported. The nuts are eaten as a stimulant. The taste is bitter and astringent.

#### Spices:

Peppers of many types are grown varying from very hot to sweet. The red, very hot, varieties are dried and marketed and exported. The sweet are generally eaten locally.

#### Dyes:

Indigo is a small herb which is grown locally for dyeing purposes. The shrub is cut to soil level and the leaves are pressed into balls about the size of a tennis ball. These balls are later broken up, dried in the sun and the material fermented in water for 12 - 24 hours. The blue dye is formed with a dense froth on top.

#### Vegetables

Various kinds are grown, a popular one being called spinnach. This is a hot season plant which withstands high temperatures and high rainfall. These are consumed or sold locally.

APPENDIX 20

Animal Husbandry.

Cattle. The number of cattle in Sierra Leone cannot be estimated accurately but is probably about 150,000 - 200,000.

Most of the cattle are kept by Fulas in the Northern part of the country and also by the border tribes such as Mandingos, Limbas and Korankos.

Other tribes do not appear to be much interested in cattle. The country as a whole could support a much larger cattle population but this would mean either the settlement of the Fulas in districts, where they do not now live or the encouragement of cattle-keeping among tribes which have not as yet been disposed to practise this branch of agriculture. The additional manure which would result from a change of this kind would benefit agriculture generally.

The distribution of the tsetse fly in Sierra Leone is patchy and all cattle are of Ndama breed. They grow slowly, are small and reach a weight of about 500 lbs. in four years. Herds are individually owned and vary greatly in size. The cattle owners are nomadic or semi-nomadic. In the area studied all cattle are owned by the Fula who bring them to the villages and towns for slaughter and sale.

Sheep. Sheep are kept by the Temne people and are Hairy Sheep of the West African types both long legged and dwarf. They are killed for the flesh but the skins are also used. Their manure is of importance to the land.

Goats. Goats are kept by the Africans for meat production and skins only. Goats can thrive as meat producers in conditions which it is difficult for other species of domestic livestock to live, it cannot be said, however, that goats flourish in the hot-humid tropics.

Goats in West Africa are of two types, the Sapel or long legged meat variety and the Dwarf West African goat. The goats are destructive of trees and thus may cause soil erosion. In certain circumstances they keep down scrub on grazing land, thus maintaining pasture, and they may also prevent the invasion of tsetse flies, where it is threatened. The symptoms of trypanosomiasis in sheep and goats are similar to those in cattle but the former are more resistant to the disease.

Poultry. Fowls and ducks are frequently kept by villagers. The poultry are left to their own devices and are not considered to be worth the attention for husbandry, of men of standing. Eggs are tabu in most Sierra Leone villages as they are supposed to be one of the causes of worm infestation. The fowls or ducks are eaten as the 'asaka' or sauce for the rice.



The manure from the fowls is also valuable for the land.

Fowls were rarely sent to market from the villages studied, but were used for local consumption. The average tropical, all-purpose fowl is only two to four pounds (0.91 to 1.8 kg) live body weight but carries a fair proportion of edible flesh on a compact body bearing a tight covering of rather wiry feathers free from down.

Some breeds have naked or nearly naked necks and thighs. There are innumerable types.

Fishing. Fish plays an important part in the diet of villagers and some fish is caught by the local people in streams and rivers. The methods used are hand lines, cast nets and fish traps, and a basin like net. Many of these devices are made locally, and even sold in the markets.

There is a sea fishing industry based on Freetown and the Bullom shore and considerable quantities of fish are dried and smoked and sold in the interior of the country. In all the villages studied, smoked sea fish was on sale.

APPENDIX 21

Dietary Habits

At Masimera and Foradugu, villagers stated that for most of the year they had three meals a day, but that these were reduced to two daily during the rainy season when few crops were harvested. Some people who were unable to work were said to eat only once daily.

At Kamasundu and Mawulay-Mamanso, villagers said that they eat twice daily all the year round. One meal being taken about noon and the other at 5 - 6 p.m. Some villagers suffer from hunger towards the end of the rainy season, the diet at that time consisting almost entirely of cassava and sweet potato. This 'hungry season' is considered to be due to rice debts.

A variety of foods were noted in the villages.

The meal usually consisted of a prepared grain, pulse or root crop together with a sauce or "asaka".

The basis of the meal is therefore commonly rice and more rarely, foofoo or soya beans.

Foofoo is prepared by grinding cassava to make a starch which after being beaten and soaked is heated until it becomes a stiff paste. Gari is another cassava preparation sometimes eaten.

Rice, white or 'rough' or parboiled or 'brown' is cooked over the fire in a large iron bowl. This is usually served in an enamel bowl covered with a lid or another bowl.

The sauce is served separately and Africans pour this sauce over the rice. They then take some rice in their right hand and mix it with the sauce which has been poured over it, this is made into a ball held in the palm of the hand and it is put into the mouth with the heel of the hand towards the mouth.

### Sauces

1. Chicken, with palm oil, peppers, onions, tinned tomatoes, mashed groundnuts, salt.
2. Cassava leaves, palm oil, groundnuts, onions, peppers, dried fish (tenish) salt.
3. Sweet potato leaves, groundnuts, palm oil, onions, beans, dried fish (barracuta) peppers, salt.
4. Sweet potato leaves, onions, okra, bonga - a dried fish from Lungi, palm oil, peppers, salt.
5. Dried cat fish, ground nuts, bonga, tinned tomatoes, peppers, salt.
6. Beef liver, groundnuts, coconut oil, peppers, onions, salt.
7. Beef, groundnut oil, tinned tomato puree, onions, peppers, salt.
8. Cassava leaves, palm oil, groundnuts, peppers, venison, onions, bonga, salt, oranges.

There is a large variety of sauces, most of them, as noted above, are made with palm oil as a basis but Fulah butter and coconut oil were also used.

Coconut oil is prepared by boiling the shredded coconut until only the oil remains.

Fulah butter, made from cows milk is a rancid, strong, yellow liquid, smelling like pepsin, and, similar to the Indian ghee. It is made by clarifying the butter formed after shaking the milk in a large vessel, the buttermilk being used as a beverage. The butter is heated in an open pan to drive off moisture, the non-fat solids settle with this treatment and the butter part can be removed.

Good ghee contains 99.5% butterfat. It has good keeping qualities and can be transported over long distances, and is used as a cooking oil.

Other foods eaten were Gari - a preparation of cassava, and Akidee, made from Ogi, which is the sediment of fermented ground maize with water. Millet was also eaten with rice.

Bread baked at Lunsar, Foradugu or Makump (a village on the Lunsar-Makeri road) was occasionally sold in the villages.

Palm wine was drunk in all the villages, and kola nuts frequently eaten.

During the season, oranges and other fruits are eaten, frequently at the end of a meal. Children seemed to eat little fruit. Meat, fish and eggs are considered to be the cause of worms in children.

APPENDIX 22

Infant Feeding Methods. The replies are given to questions based on the World Health Organisation inquiry (Jelliffe, 1955).

1. Breast Feeding

2. When started? Boiled water and then the breast are given on the first day in normal cases.

3. How long continued? 18 months to 2 years. A shorter time is allowed if the father can afford to feed the baby on tinned milk.

4. Any difficulties (flow inadequate)? If a mother does not have breast milk the 'Cow and Gate' milk is given. This is the dried milk supplied by the Government Dispensaries.

5. When are supplements introduced? After 9 months old.

6. Types of supplements? Soft rice, cassava starch, banana. Later on up to 2 years; oranges, palm oil, green leaves, eggs, meat as part of the sauce.

7. How are supplements fed to the baby? By spoon, or from the hand. Some have feeding bottle.

8. Is sexual intercourse practised during breast feeding?

Not practised until the end of breast feeding. It is believed that it would kill the infant.

9. Special customs. If the baby gets worms, or the mother becomes ill, the breast is painted with bitter green leaves to prevent the infant feeding.

10. Pregnancy - 'get belly' in Creole, has no dietetic restrictions. She may not board a vehicle or do hard domestic work such as cut wood.

During Delivery the woman lies on her back. The placenta is buried.

The umbilical cord is cut with the knife and the cut end covered with grated coconut or kola nut and bandaged.

Baby care (Kamasundu) The baby is bathed in very hot water in order to keep illness away. Coconut oil is then put on the skin. The child wears a charm on its wrist.

It was noticed that toilet training was strict. A female child of about two years old was severely beaten for urinating on herself.

Child Care. A mother wiped the discharge from the nostrils of her child with her finger and thumb and wiped it onto the sole of her foot.

If a child passed faeces during the medical examination the mother would wipe its bottom with the lapa she was wearing.

APPENDIX 23

Native Medicine

Many Africans consider that all disease and death are caused by witchcraft.

Patients complain of this. One female, aged 35, with talipes of left foot said that a witch had caused a fish to bite her, which resulted in a wound and the deformity followed.

Another man, aged 45, said that he had felt the breath of a witch on his neck as he passed down the street and this accounted for his rash.

A woman, aged 63, with her right eye shrunken and destroyed by onchocerciasis said that this had been done by her daughter who was a witch. The daughter died when she was about 15 years old. On being asked if 15 years was not rather young to be a witch the reply was that some witches were even younger at eight or ten years old.

However, this does not clash with practical methods of treatment of disease, which were seen during the course of the survey or were described.

The treatment of a fractured spine due to a fall from a tree, was described at Kamasundu. A trench was dug large enough to take the patient and this was partly filled with a couch of leaves. The patient lay on the leaves face downwards and he was covered with earth except for his head. A fire was then lit on top of

the earth over the point of the fracture and it was left there for one hour. This was performed once only. He was then given medicine to drink.

It is noteworthy that this treatment was performed on a male aged 43 (no.112) who subsequently went to hospital. When seen during the survey he had a kyphosis in the lower thoracic region but had no residual paralysis.

Prognosis amongst the Temne. If a person is very ill - make the sound of money, and if he does not lift up his head, he is going to die!

Headache: shaving off a swathe of hair down the middle of the head, or cutting over the malar bones in two parallel incisions is used to cure headache.

Native Medicines sold by Aye Kargbo (Bai Kargbo No. 50) at Kamasundu. She collects and sells aromatic herbs which are used for "bellyache", "dysentery" and "gonorrhoea".

Measles (Masimera). A cloth band is tightened round the chest to prevent coughing.

"Dada" Hair style seen in Mawulay-Mamanso. The hair is twisted into worm-like strands and only cut with an appropriate ceremony. Palm oil was put on hair for head lice. This dried and had to be distinguished from hypochromotrichia.

Teeth. Sticks are used for cleaning teeth, also river sand. The more sophisticated use tooth brushes.



Kohl "Antiro" in Temne, is frequently used around the eyes. It is not put inside the conjunctival sac as it is in East Africa.

Mud is used as a paste. This is put on the vertex as a cure for sores, headaches, sprains and other conditions. The whole body of a female child aged  $2\frac{1}{2}$  was covered in white mud as a cure for measles.

Charms are frequently worn to protect against illness, evil, or to give "power", meaning sexual power.

The charms may be worn as an arm band by a man, attached to an apron for a woman, or attached to the hair of the head, or the clothes. Infants have them round their wrists or necks. Adults also have necklaces of charms.

Scarring. This is used for headache, as has been described, as beauty marks or for initiation into a society such as the Poro, or tribal marks. The Limba cut for this purpose, "native medicine" a sort of charcoal is rubbed in to make the scar visible and permanent.

Leaves are tied round the chest for pain.

Fire was used to keep a person warm when he feels the chill of malaria. The person may be so close to the fire that he sustains a burn.

APPENDIX 24

Glossary of Temne Words used in Medicine

Blindness	- Ofeith'e
Chickenpox	- Kabanah
Doctor	- Bolumba
Diarrhoea	- Angrunt
Dysentery	- M'tirr
Gonorrhoea	- Akimalee
Leprosy	- Ralele
Leprosy with loss of fingers	- Mabet
Malaria	- Otank
i.e. Fever, a cold feeling.	
Measles	- Akaka
Onchocerciasis	- Ebouton
Smallpox	- Kabumbu
Simulium spp	- Mape'is, Mapus (Blacklock 1926).
Tuberculosis	- Kasorrkoo'oosi
Yaws	- Katheirre
Yaws Sabre tibiae	- N'gbenneh
Yellow Fever	- M'gbonkay

## APPENDIX 25

### Medicine and Anthropology

Both medicine and anthropology are aspects of the study of man in his environment, and it is natural that these two fields should be contiguous and complementary.

Many of the earliest anthropological observations were made by medical men, Vesalius of Padua and Paaw of Leyden being among the first.

In modern times the separation of these subjects has had certain disadvantages and they can be brought together with great benefit in the fields where social anthropology and medicine meet and indeed overlap.

The medical man working in a bush area of West Africa must have numerical data about the population at risk. This information, often collected by sampling techniques and including as it does civil data as well as clinical data, is also of importance to the anthropologists and may well supplement their interview techniques with statistics.

The doctor may also be able to collect information during the course of his work about matters of significance to tribal African society such as the sorts of scars, operations and mutilations carried out by the societies.

Because of the nature of the doctors relationship to the patient he is often able to observe things without making the person feel that he is enquiring specifically into the subject.

The doctor inevitably comes into the intimate life of the family groups and because of his privileged position is able to make observations. The advantages of co-operation do not work in one direction only, however. The doctors work will be greatly facilitated if he approaches tribal Africans with the knowledge of status, importance and function of tribal and village personages which can be supplied by the anthropologists. Lack of this knowledge may wreck a research project.

It is very important for the doctor to realise the importance of magic in the life of the Africans. The doctor will lose the confidence of the people if he takes a superior or antagonistic attitude to native medicine or native medicine men, and indeed if cooperation is achieved, the local medicine men will bring the doctor patients on the basis that there are some diseases which the white doctor can cure and others that he cannot cure for which native medicine is superior. 'Life is short, the art long, opportunity fleeting, experiment dangerous and judgement difficult' and nowhere more so than in bush Africa. The physician will soon realise that patients' reactions may be unlike anything he has previously seen in Western populations.

The social aspects of medicine extend into almost all departments of human activity and by sharing the field with anthropological colleagues a much bigger coverage can be achieved.

The doctor, brought up and educated in his own culture is likely to find that in gathering information about his patients he is likely to be making a whole series of assumptions, based on his own education and culture, which, are erroneous.

For example, in taking a case history and finding that a woman is 'married', it must not be assumed that this state has the same functions, obligations, relationships, etc., as in the Western World. An effort should be made, with the cooperation of the anthropologists to investigate what exactly the state of 'marriage' really means in the field work area. This is of prime importance in studying obstetric and psychiatric histories.

The doctor must learn from the anthropologist what behaviour is socially acceptable or otherwise, and he should be on the look out for patients reactions to questioning, examination, drug taking, injections, blood and stool examinations and other procedures. These observations may become of first importance when any measure of preventive medicine is being applied. It is very important that all measures are made culturally acceptable.

It is important for the medical scientist to understand the attitudes of the people amongst whom he is working. The taking of samples of body fluids, for example, may be anathema to some people. In the case of the Temne, skin snips, blood films, or urine tests, were

regarded with complete equanimity. In fact, the complete lack of fuss among the children when skin or blood was taken was quite remarkable.

The doctor must also be prepared to give a considerable amount of time preparing the ground for investigation. He must greet Chiefs, Medicine men and women, Digbas and Imams, and others with adequate ceremony, and respect the way in which they wish things to be done. This means sitting down with them and letting them get to know the field worker, association with whom may enhance their prestige. He should also take an interest in the life going on around him. He should not work in an area where any ceremonial or group activity is going on unless this is considered quite appropriate by the tribal authorities.

It is important for the doctor to understand the groups in a village, their interrelationships and kinship. The distribution of authority in a village must be understood. In one case there was a struggle for dominance between a Paramount Chief and the Chief Clerk of the Native Administration. Where the clinic would be held depended on which one of these would gain the ascendancy. No preference was expressed so that sides were not taken and the decision was accepted without question.

In short, the doctor working in the field should have a strong interest in human behaviour and anthropology and he should be prepared to learn, adapt and modify his

approach, techniques and deductions. He should also be modest about his knowledge and be prepared to learn from the so called 'primitive' peoples. It should be remembered that there are many skills such as tracking, bush craft, crop cultivation, canoe construction, and many others, which have not yet been surpassed by western culture. Knowledge and wisdom are not the prerogative of any particular people.

List of Illustrations Photographs by G. S. Mills.

1. View of Lamsar from Masabala.
2. King Edward Street, Lamsar, showing a woman's dance society in the street.
3. Old Lamsar. Note construction of houses.
4. Lamsar Market.
5. Lamsar Health Centre.
6. Roman Catholic Mission School, Lamsar.
7. Water point, Lamsar.
8. Well in yard, Lamsar.
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10. Sea salt arriving from Masabala to Lamsar.
11. Māzā cattle for slaughter in Lamsar.
12. Rubbish dump, Lamsar. Vulture calling a dead dog.
13. Iron ore mining. S. I. D. C. Marāpa.
14. Removal of over **ILLUSTRATIONS** D. Marāpa.
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20. Crossing the Lokai River.
21. Masabala. Village Street.
22. Monday - Masabala. Girls at Gole's House.
23. Rice planting. "Braking". Sowing the seeds.
24. Rice farming. Preparing the ground for swamp rice.



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28. Bundu girls in Kamasundu, during the initiation period, with Digba.



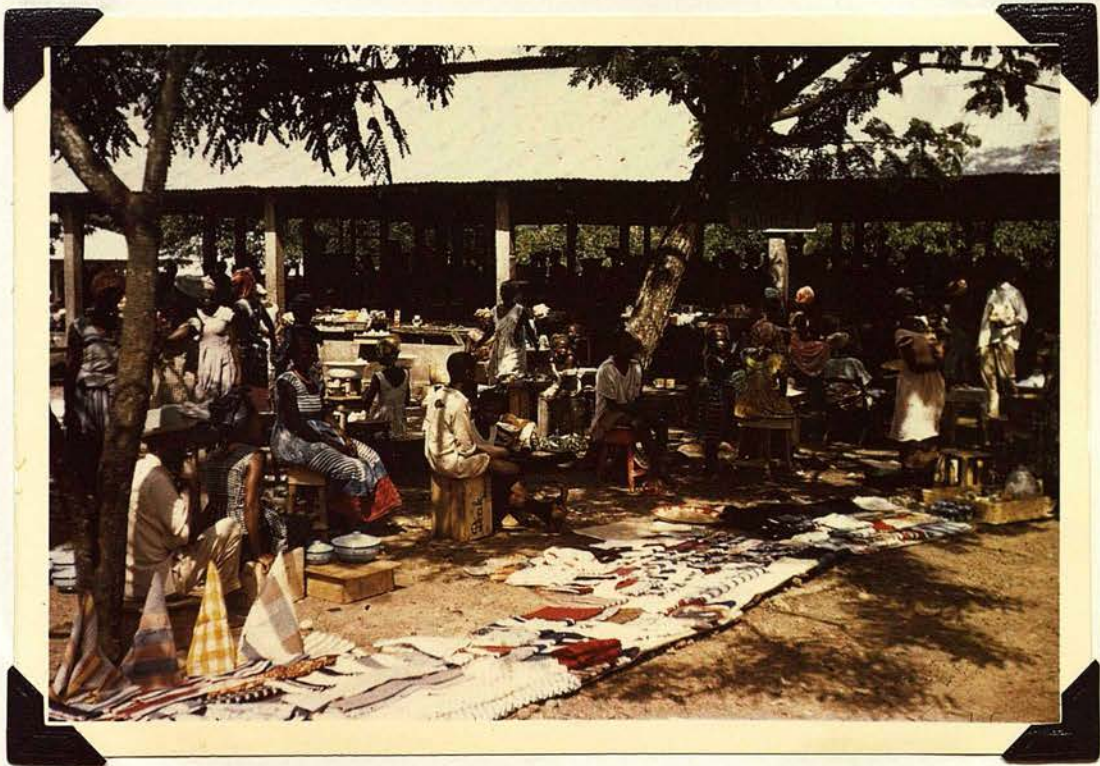
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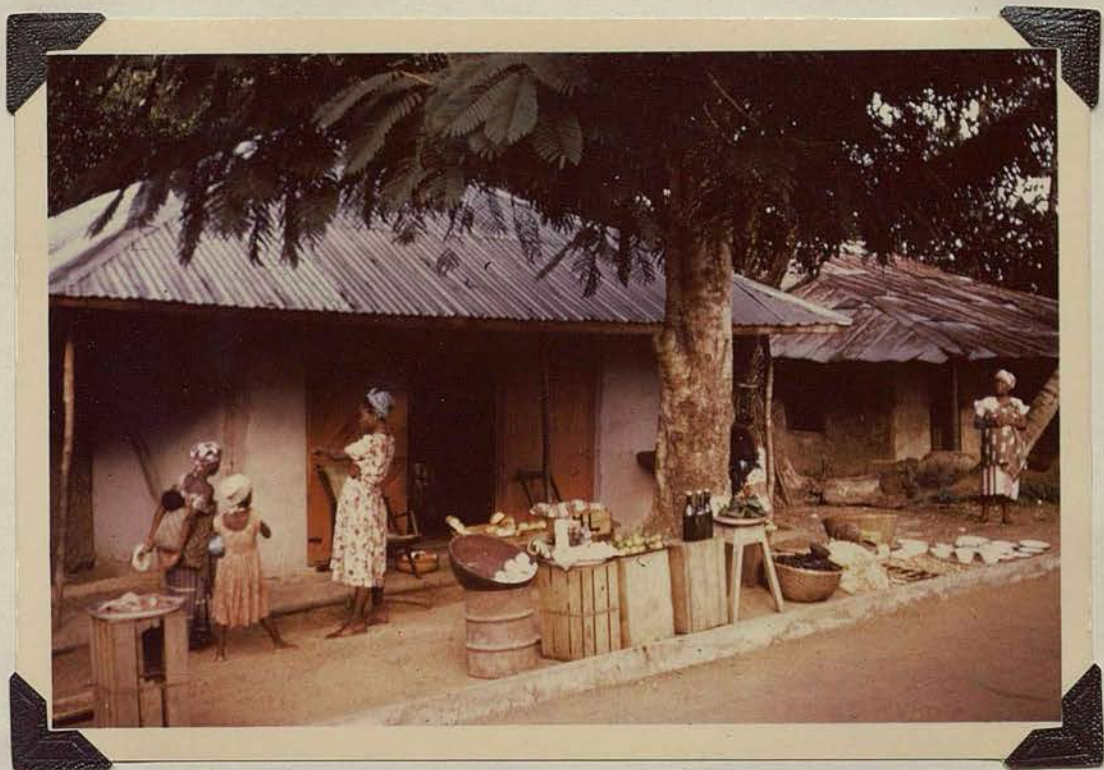
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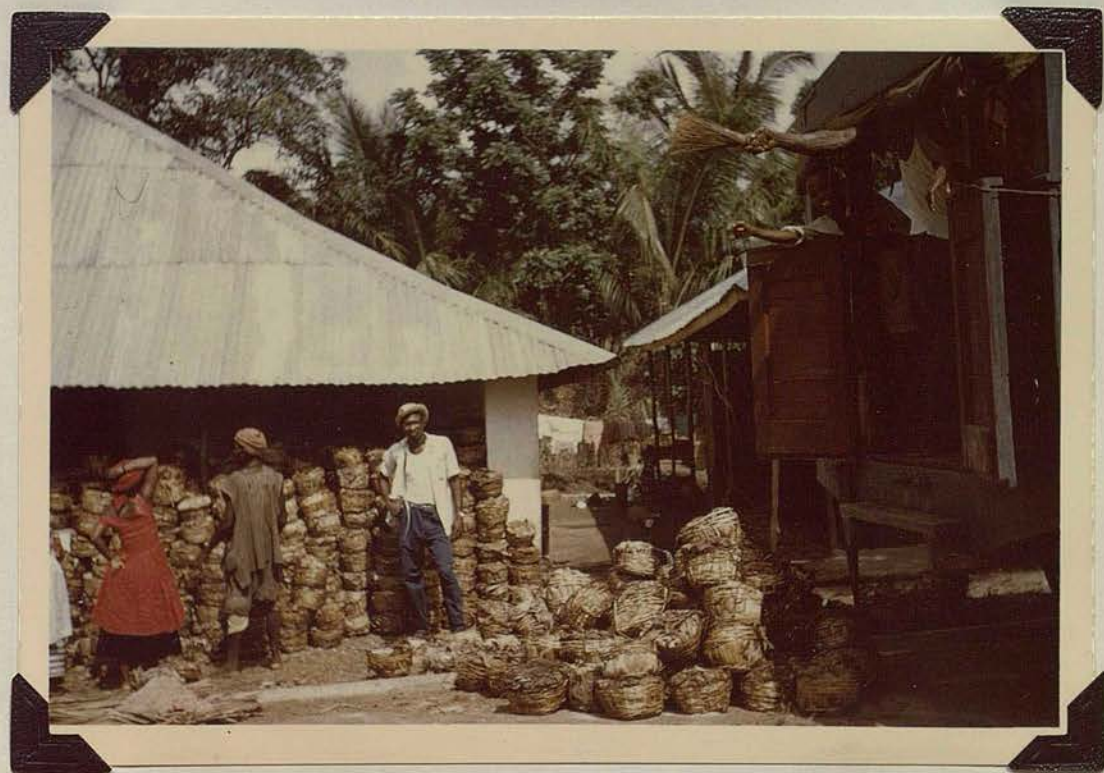
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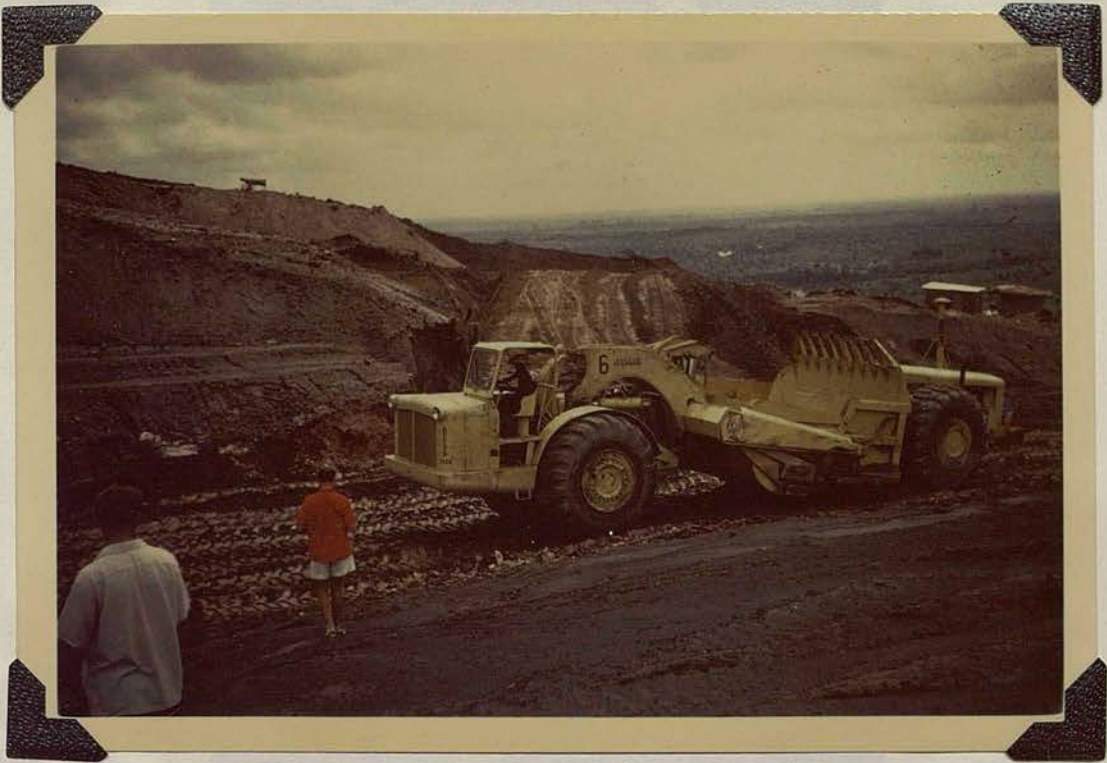
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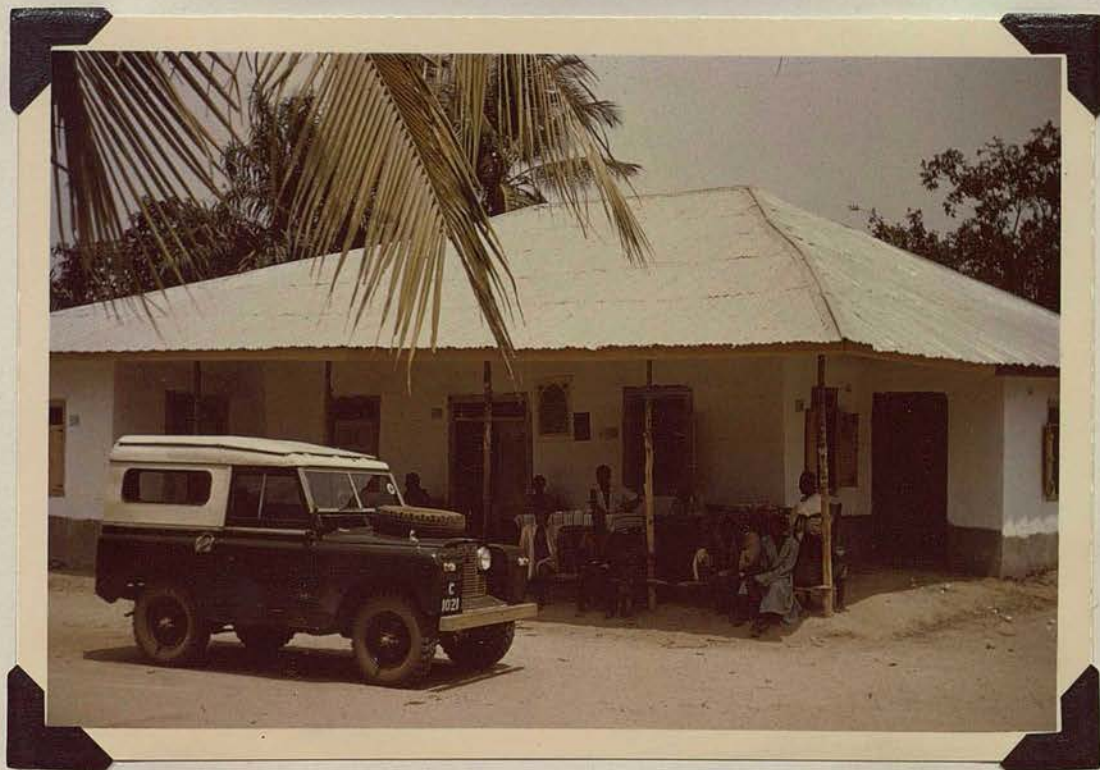
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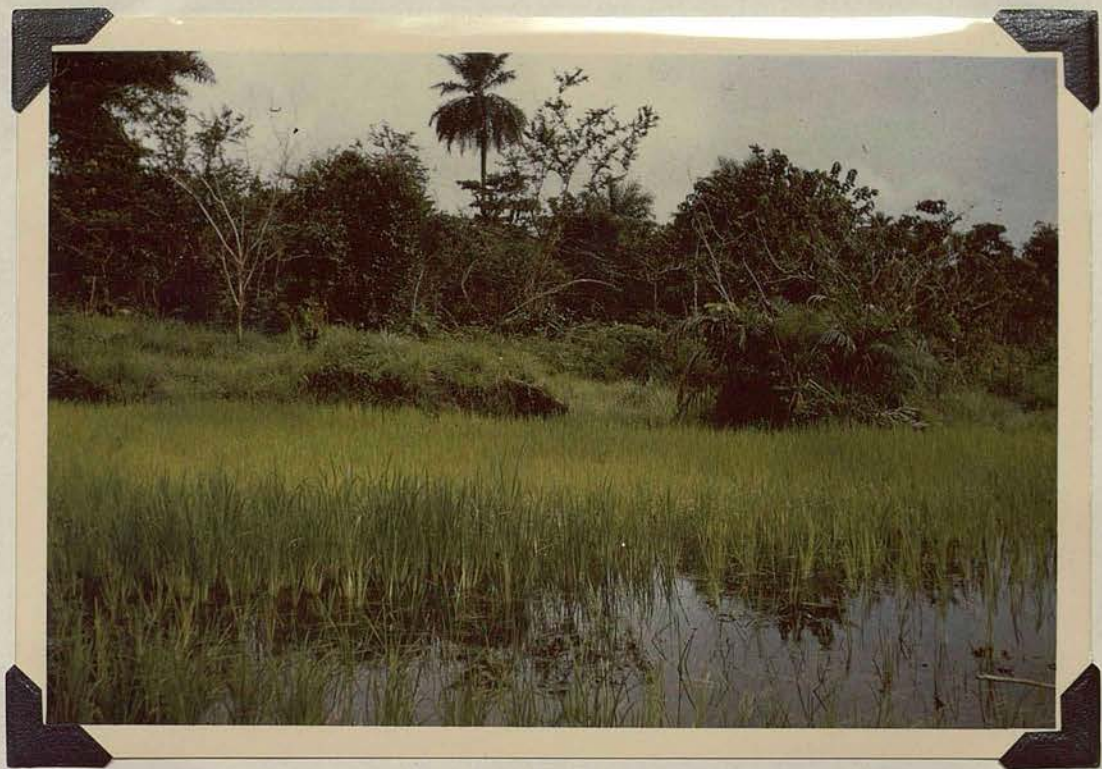
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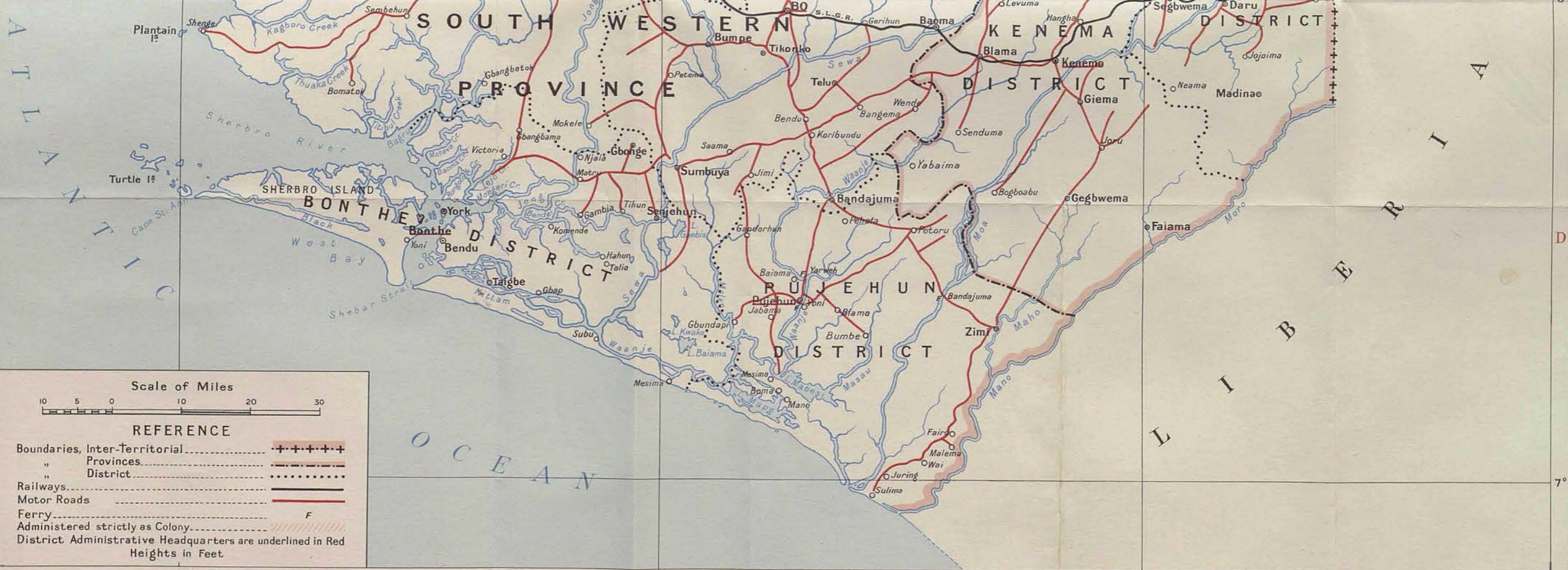
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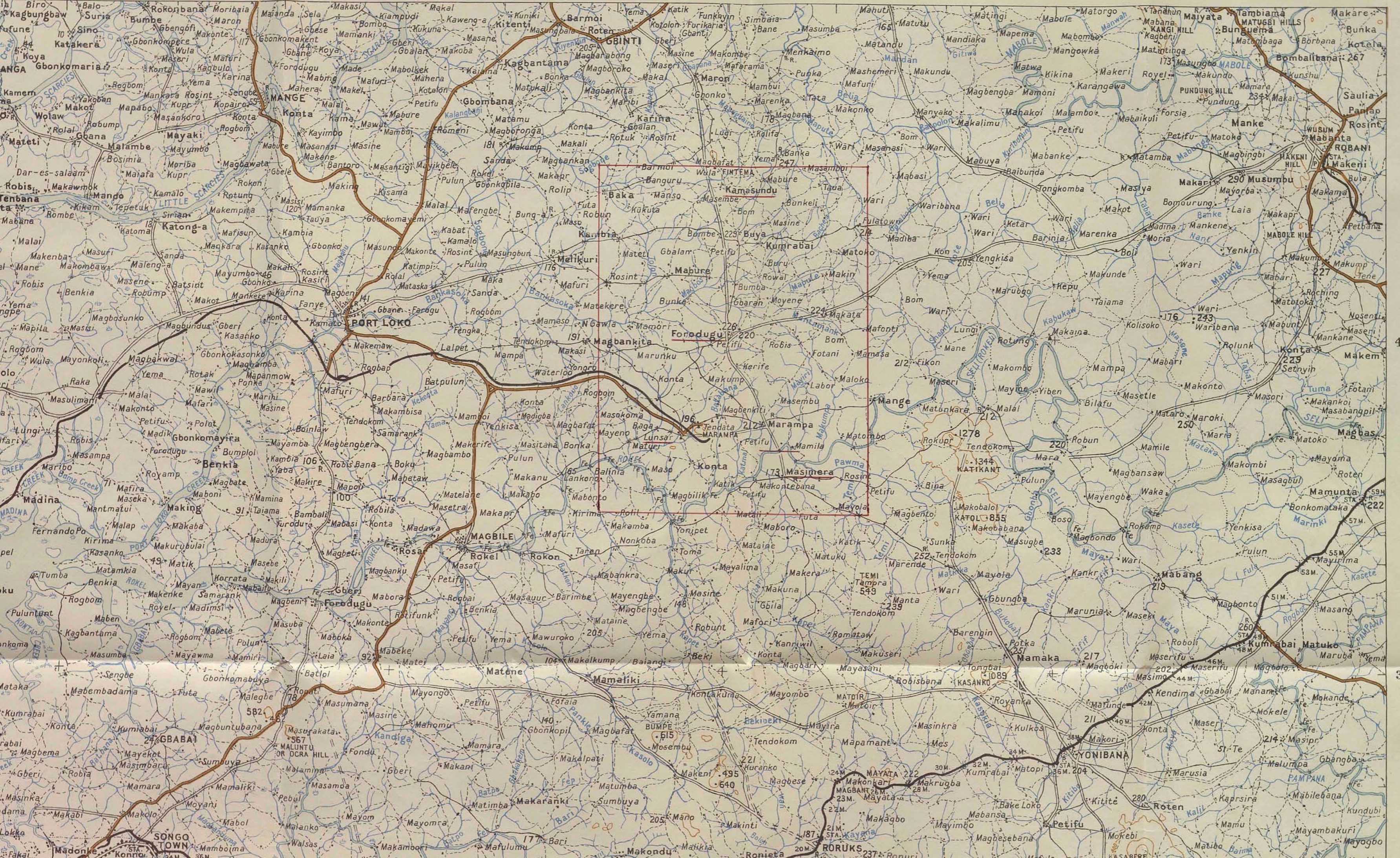
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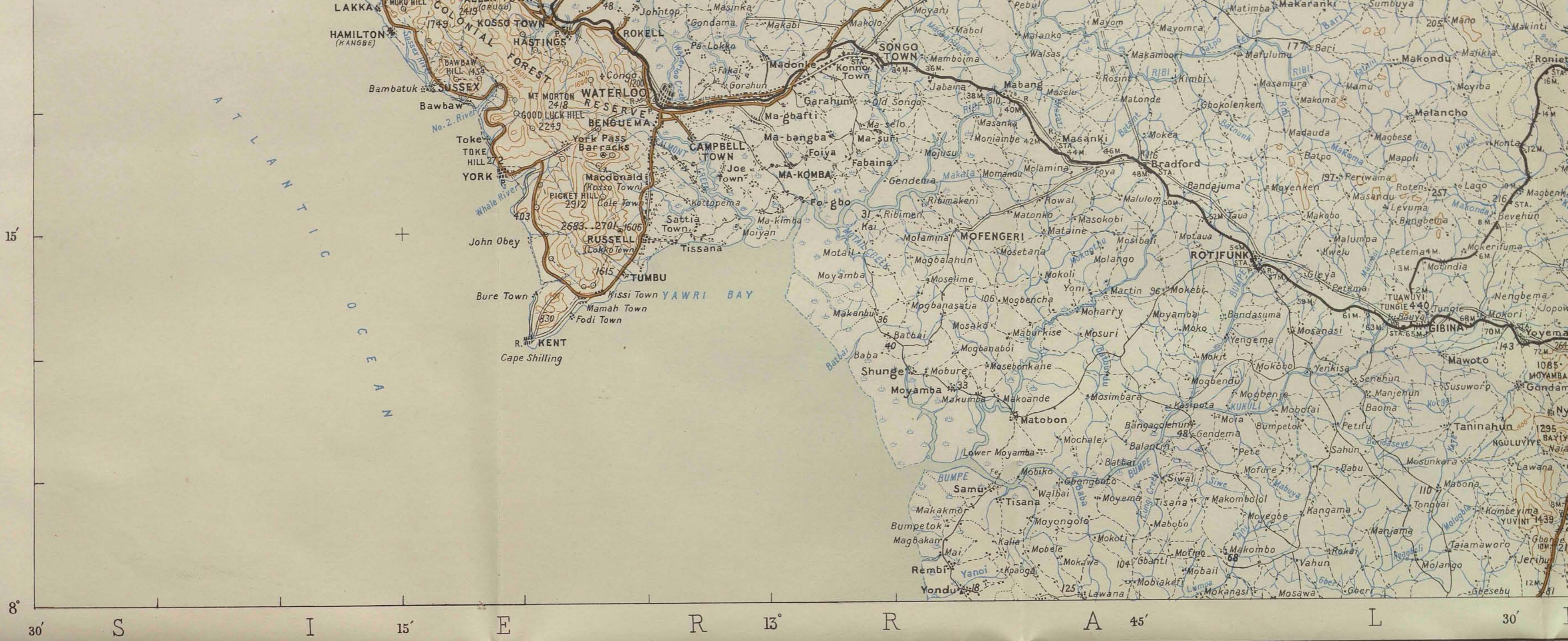
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REFERENCE

- Towns—Population over 5000
- " " under 5000
- " " 1000
- " " 200
- Lighthouse
- Post Office
- Telegraph and or Telephone
- Rest House
- Large river
- Small " and streams
- Streams sometimes dry
- Rivers or streams unsurveyed
- Bridge
- Ford (foot)
- Ford (Vehicle)
- Wells and springs
- Marsh

- ACCRA
- LABADI
- Magbeu
- Rokai
- L.H.
- P.
- T.
- R.
- International boundaries
- Provincial
- Boundary pillars
- Trigonometrical Heights (feet)
- Aneroid Heights (feet)
- Roads motorable all weather
- " during dry season
- Tracks
- Hammock or cycle paths
- Tracks suitable for head loads
- Telegraph lines along roads
- " paths
- Railway—double line
- " single line
- " under construction
- Wireless Station
- Form lines 400 feet Vertical Interval
- Roads under construction

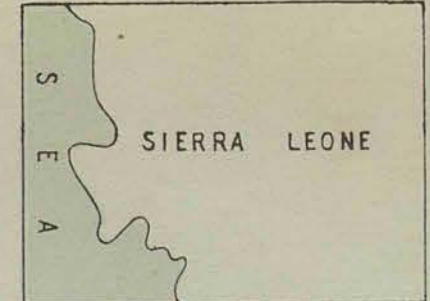
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SEA	FREETOWN	MAKUMP
SEA	BONTHE	KENEMA

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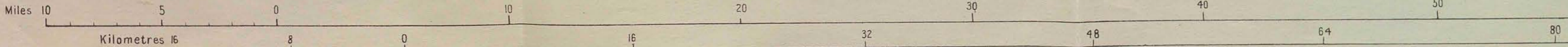
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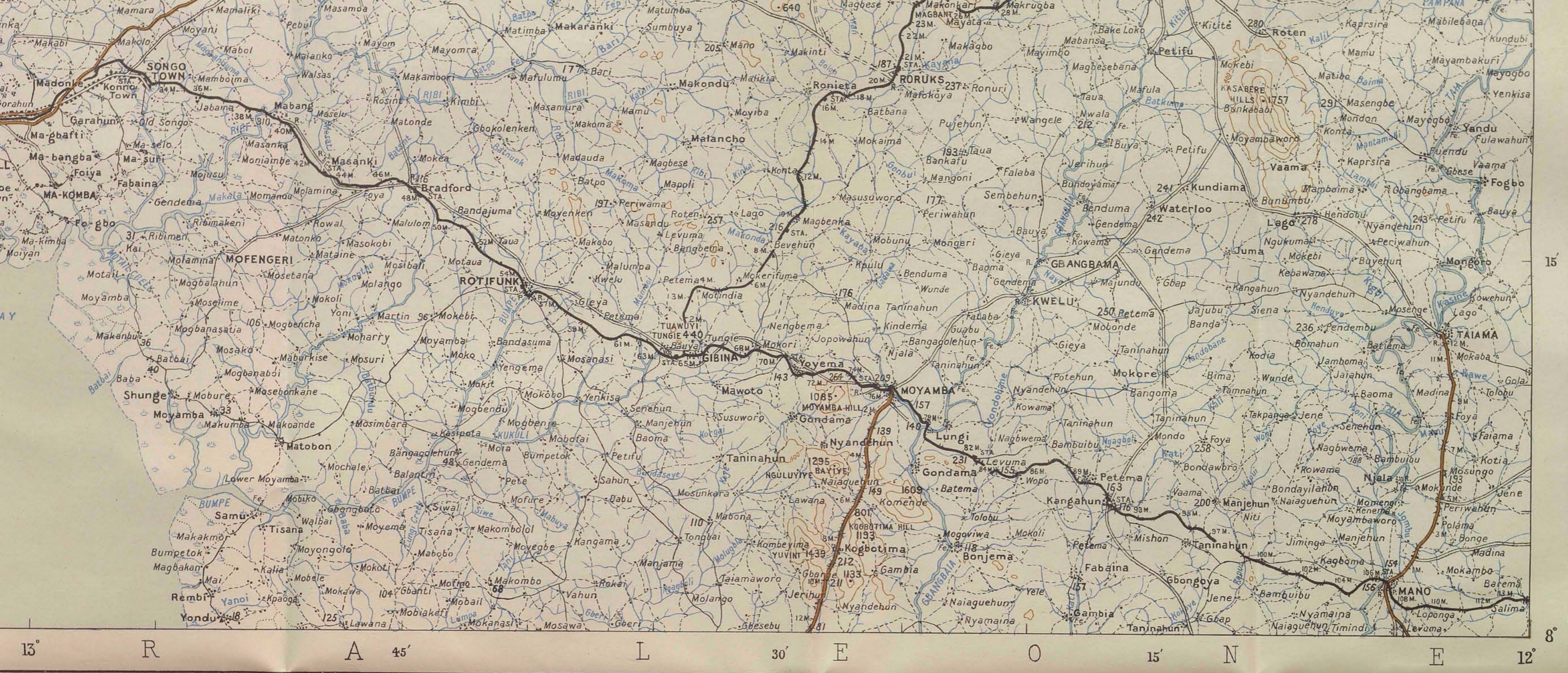
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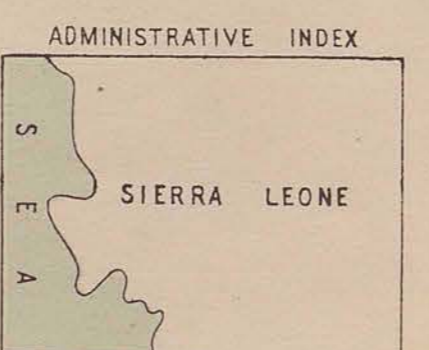
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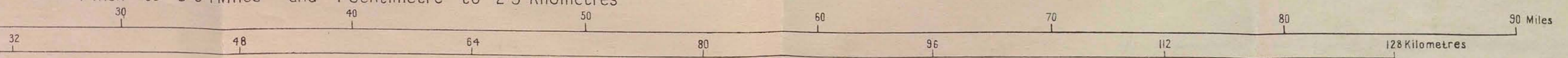
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




1 Inch to 3.94 Miles and 1 Centimetre to 2.5 Kilometres





# A SKETCH PLAN OF LUN SAR



-  Inhabited house
-  House under construction
-  Not human habitation
-  Water (point)
-  Path
-  House selected by random sampling

