

Report of the Ministry of Health / [Ghana Government].

Contributors

Ghana. Ministry of Health.

Publication/Creation

Accra, Gold Coast : Govt. Printer, [1954]

Persistent URL

<https://wellcomecollection.org/works/bx9pju6w>

License and attribution

This work has been identified as being free of known restrictions under copyright law, including all related and neighbouring rights and is being made available under the Creative Commons, Public Domain Mark.

You can copy, modify, distribute and perform the work, even for commercial purposes, without asking permission.



Wellcome Collection
183 Euston Road
London NW1 2BE UK
T +44 (0)20 7611 8722
E library@wellcomecollection.org
<https://wellcomecollection.org>



GHANA GOVERNMENT

REPORT
OF THE
MINISTRY OF HEALTH
1954

Printed and published by the Government Printer, Accra. To be purchased from the Government Printing Department (Publications Branch), Accra, Ghana, and from the Crown Agents for Oversea Governments and Administrations, 4 Millbank, London, S.W.1.

1957

PRICE — TWELVE SHILLINGS AND SIXPENCE

RBB/74



22501293515

REPORT OF THE
MINISTRY OF HEALTH
1954

THE ROYAL SOCIETY
OF HEALTH
LIBRARY

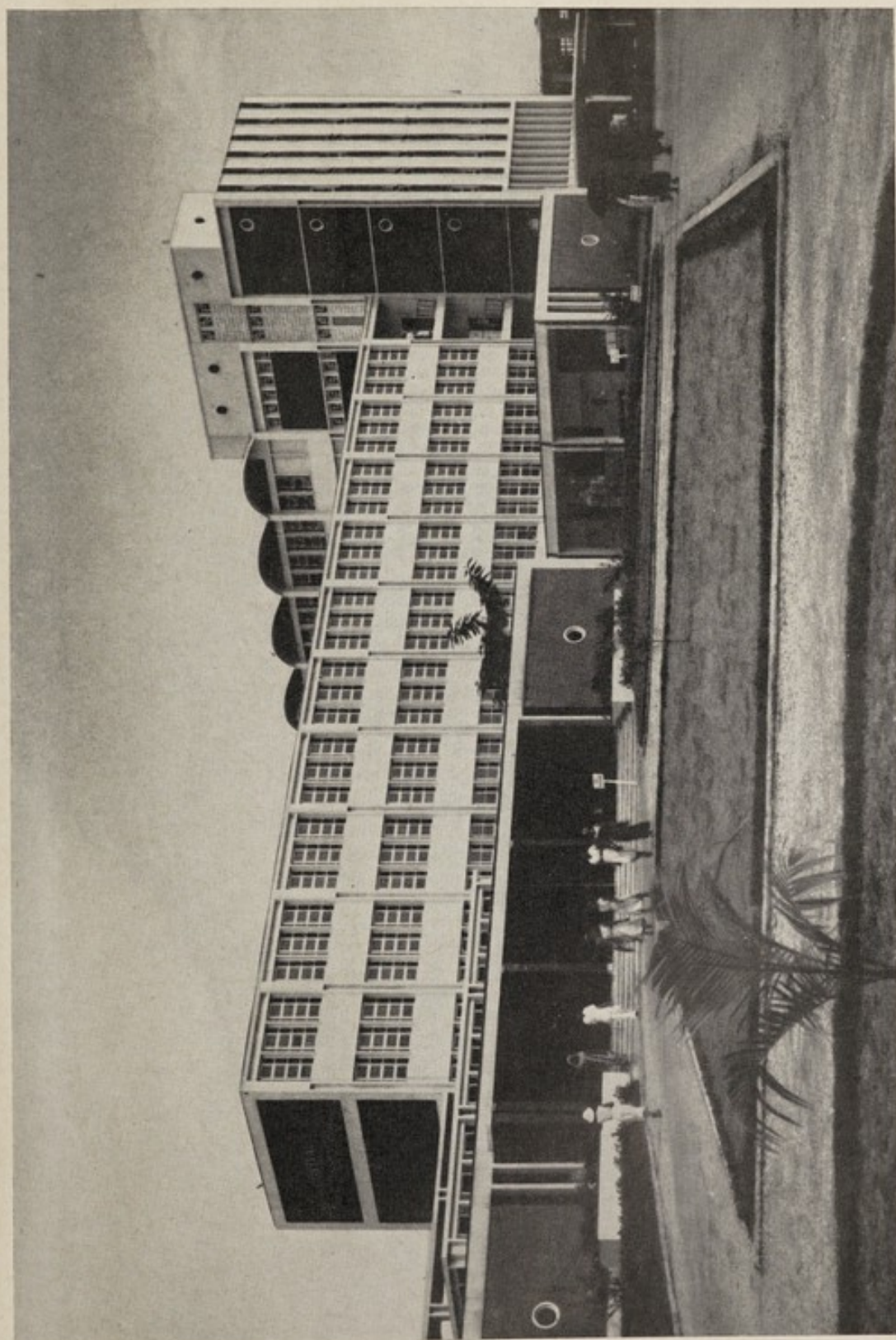
PRINTED AND PUBLISHED BY THE GOVERNMENT PRINTER
ACCRA, GOLD COAST

1956

-18318038

WELLCOME INSTITUTE LIBRARY	
Coll.	wuIMOmec
Call	+
No.	AnnKip
	WA 28
	.HG 6
	G 61

1954



Kumasi Central Hospital



REPORT OF THE MINISTRY OF HEALTH

Part I

General Summary of Administration and Development for the Year 1954

REPORT OF THE COMMISSIONER OF THE LAND OFFICE

1871

OF THE
LANDS BELONGING TO THE
GOVERNMENT OF THE DISTRICT OF COLUMBIA
IN THE YEAR 1871

FOREWORD

The report of the Ministry of Health for the calendar year 1954 follows the lines of the Report for 1953 but the report of the Chief Medical Officer (Part II of the Report) contains much more detail than before. It is partly for this reason that the publication of the report has taken so long a time and it is hoped that any inconvenience caused by the delay will be more than compensated by the value of the additional information provided.

A. R. ELLIOTT
Acting Permanent Secretary.

IMORU EGALA, M.L.A.
Minister of Health.



Digitized by the Internet Archive
in 2019 with funding from
Wellcome Library

<https://archive.org/details/b31478189>

General Summary of Administration and Development

I—ADMINISTRATION

The Ministry of Health which incorporates the former Medical Department is responsible for advising on the formulation of Government policy and its execution in the field of health, for the administration of health services maintained by the Central Government, for supervision and guidance of health services maintained by Local Government authorities and bodies receiving financial assistance from the Central Government and for the promotion of improved health standards throughout the country.

At the headquarters the Permanent Secretary is responsible to the Minister for all administrative aspects of the Ministry's responsibilities and functions. The Chief Medical Officer, of equal rank and status with the Permanent Secretary and also having direct access to the Minister, is the chief adviser to all Ministries and Departments on technical and professional matters concerning health; he is the head of the Government Medical Service and is also chairman of such statutory bodies as the Nurses Board, the Midwives Board and the Pharmacy and Poisons Board. Both the Permanent Secretary and the Chief Medical Officer have appropriate staff to carry out their functions and these staffs collaborate at all levels.

The Deputy Chief Medical Officer is stationed at headquarters and there are Principal Medical Officers also at headquarters and at Cape Coast, Kumasi and Tamale in charge of health services in their respective regions. During the year a fifth Principal Medical Officer was posted to a separate office in Accra to take charge of health services in the Accra and Trans-Volta Regions. The health services of the Trans-Volta/Togoland Region have continued to be administered from Accra and will be administered from Ho when buildings under construction are ready and a Senior Medical Officer has been appointed; it is intended then to transfer to the Principal Medical Officer at Accra the responsibility for health services in the Eastern Region at present administered from Cape Coast.

There was a noticeable improvement in the distribution of drugs and medical equipment during 1954 as a result of the reorganisation of the medical stores system for which plans were introduced in 1953. As stated in the 1953 Report the Central Medical Stores is now situated at Takoradi the main port, and there is a Regional Store at Accra to serve the Eastern Region and Trans-Volta/Togoland Region as well as Accra. The new Regional Store at Kumasi had been completed by the end of the year and arrangements were being made to put the building into use in the early part of 1955. A site had been selected and plans prepared for work to start on the construction of the third regional medical store at Tamale during 1955.

The Ministry of Health continued to be closely associated with the Preparatory Commission in examining the health aspects of the Volta River Project.

The policies adopted by the Government in the light of the recommendations of the Maude Commission of Enquiry into the Health Needs of the Gold Coast in 1952 continued as the basis of planning and execution of improved health services.

II—STAFF AND SERVICES

The numbers of the main categories of medical and health staff are set out in Appendix A. In senior ranks of the Government, another Gold Coast man was appointed Principal Medical Officer during the year thus bringing the number of Gold Coast men holding the post of Principal Medical Officer to three. There were a number of changes in the holders of senior posts arising from retirement and replacement. Two Specialist Pathologists, one Specialist Obstetrician and Gynaecologist and one Ear, Nose and Throat Specialist were appointed during the year.

Child Welfare clinics and ante-natal maternity services are maintained by the Central Government, Local Authorities and voluntary agencies such as Missions and by the Gold Coast Branch of the British Red Cross Society; the last-named operates such services at Accra, Sekondi, Kumasi, Cape Coast and Koforidua (all static) and a few mobile clinics are operated in various parts of the country. A small grant was made by UNICEF for promotion of Mother and Child Welfare Services in equipping Health Centres, nurse and midwifery training centres and in provision of midwifery kits.

Laboratory services are provided at all Government hospitals; the central laboratory is situated at the Medical Research Institute, Accra.

Medical Field Units, with their main headquarters at Kintampo in Ashanti, conduct campaigns against trypanosomiasis and yaws and epidemics as they may occur, e.g. cerebro-spinal meningitis and smallpox. Concurrently the Units conduct surveys of the incidence of disease in rural areas, promote health education and administer treatment at permanent treatment centres. Their activities at present are largely directed towards improving conditions in the Northern Territories including Northern Togoland, Ashanti and Trans-Volta/Togoland Regions where the need is greatest; it is intended that they should be developed to cover rural areas throughout the country.

The programme of construction of new hospitals and other projects, and improvement of existing hospitals showed good results in 1954. At Kumasi Central Hospital the construction of an administration block, out-patients department, two ward blocks, a maternity block, theatres, kitchens, laundry, power house and other ancillary services were completed, and work continued on the construction of two further ward blocks and the Nurses Training Unit. The new hospital at Bawku was completed and put into use and at Bolgatanga a

lecture room for pupil nurses was nearing completion. The maternity and children's wards at Yendi were completed and the buildings at Wa and Navrongo Hospitals were almost ready for occupation. Good progress was made with construction of the larger hospital at Jirapa. The structure of the out-patients department at Sekondi Hospital was well advanced and work on the extensions to the Gold Coast Hospital, Korle Bu, was commenced. At the Mental Hospital, Accra, various works including two dormitories were undertaken; work also commenced on the installation of a modern sewage disposal plant. At Tamale major improvements to the accommodation were undertaken and at Sunyani Hospital a Maternity Unit and other extensions were completed. Type plans were prepared and sites selected and approved for Health Centres at Tumu, Bole and Kintampo, and preliminary work on site clearance commenced on the Kokofu (Ashanti) leprosarium. Construction of the Kwahu Hospital to be run by the Seventh Day Adventist Mission, was nearing completion and at Mampong Maternity Hospital, staff quarters, a mortuary and an operating theatre were under construction to supplement the hospital and midwifery training facilities which were formally opened in May. At Kumasi the new offices for the Regional Headquarters of the Ministry were completed and occupied.

At the Ankaful Leper Settlement near Cape Coast, the current construction programme for which funds had been made available under Colonial Development and Welfare Funds was virtually completed during the year. Accommodation is now provided for 450 patients. Ankaful serves not only as the main leper settlement for the treatment of infectious leprosy, but also as the centre from which the facilities at hospitals and clinics for leper patients in other parts of the Gold Coast are directed. The settlement has now reached the stage where it is a self-contained community and offers amenities to leper patients which are far in advance of anything previously available. The treatment of out-patients with sulphone drugs was further expanded and by the end of the year more than 19,000 persons with leprosy were receiving weekly treatment at more than 200 centres in the Gold Coast, representing a considerable advance on the figures for 1953. As stated in the preceding paragraph construction of a smaller leper settlement was begun at Kokofu in the Ashanti Region.

The Tuberculosis Specialist continued his investigations and the mobile mass radiograph unit ordered in 1953 was delivered in 1954 and put into operation. Preliminary surveys of school children were carried out towards the end of the year, and a community survey in selected areas was due to commence in January, 1955. A Medical Officer with experience of tuberculosis work who would provide full-time assistance to the Specialist was posted to Korle Bu Hospital, Accra. A Surgical Specialist from the Gold Coast spent four months in the United Kingdom studying chest surgery.

X-Ray units were installed at the new Kumasi Central and Keta Hospitals. Further extensions of radiographic facilities were planned for execution in 1955.

Pathological Services are being improved and extended in spite of the difficulties experienced in recruiting supervisory staff. The Blood Bank in Accra, established with the assistance of the Gold Coast Branch of the British Red Cross Society and enlisting the support of voluntary contributors, continued to be a valuable adjunct to treatment facilities, especially at the Maternity Hospital.

The Government Dental Services are entirely manned by Gold Coast personnel; these officers, seven in number, including one Gold Coast Lady Dental Surgeon, all qualified in the United Kingdom. Recruitment of additional newly qualified dental surgeons will follow in 1955. Static dental clinics are in operation at Accra, Sekondi, Kumasi and Tamale and a mobile dental clinic has continued to operate in parts of the Eastern and Western Regions and in the Trans-Volta/Togoland Region.

In 1953, all but three of the Government Hospitals had been supplied with one or more ambulances, those outstanding requiring garages to be built. In 1954 only one hospital still required to be supplied and an ambulance and accommodation will be provided for this hospital in 1955.

Local Authorities, especially in Ashanti, continued to expand the provision of dressing stations and maternity homes; there is need for closer control of these and private facilities, and this is engaging the attention of the Government in the interest of improving services and reducing abuses.

During 1953, it was appreciated that the basic necessity of improved environmental hygiene and the responsibilities of local authorities in this regard were inadequately recognised. Consequently, in 1954 discussions took place between the Ministry of Health and the Department of Social Welfare and Community Development as a result of which at least three large scale jointly organised mass education campaigns will be conducted in general health education and the fundamentals of preventive medicine. Great importance is attached to these campaigns, which can do much to raise the standards of hygiene and living generally in the villages and towns. It has to be recognised, however, that many local authorities set up under the recent re-organisation of local government are not yet in a sufficiently strong position to permit the establishment of appropriate local authority health services within a co-ordinated framework of supervision by the Central Government which constitutes a necessary and desirable aim of policy.

The participation of missions in medical work continues to expand and is being encouraged as a policy of Government where Government itself is unable to provide the facilities required and in so far as the funds available for financial assistance permit. Mention has been made above of the hospitals built at Jirapa and Navrongo by the White Fathers Mission with funds provided by Government. The Maternity Hospital and Midwifery Training Centre at Mampong was opened in May and is being run by the English Church Mission. Good progress was also made on the Kwahu Hospital at Atibie near Mpraeso to be staffed and run by the Seventh Day Adventist Mission; this hospital is expected to be in use by the middle of 1955. Plans are also under consideration for the hospital at Worawora to be run by the Evangelical Presbyterian Church. Grants were made to the Methodist Mission for medical work at Wenchi in the Ashanti Region, the Basel Mission for training of staff at their hospital at Agogo also in the Ashanti Region, the Salvation Army at Begoro in the Eastern Region and various Roman Catholic Missions operating clinics in the Western and Eastern Regions and at Jirapa in the Northern Territories Region.

III—TRAINING OF STAFF (OTHER THAN MEDICAL AUXILIARIES)

Training of Pupil Sanitary Inspectors for the R.S.I. qualification and refresher courses for older men continued at the School of Hygiene in Accra. The training is designed for the requirements of sanitation in municipalities and for the more responsible supervisory posts. Training also continued at the schools in Kintampo and Tamale where the emphasis is primarily directed to a less advanced type of training which is adequate for the staffs of local authorities, in the smaller urban and in rural areas.

IV—RESEARCH

The second meeting of the provisional West African Council for Medical Research was held in Lagos at the beginning of March, and was preceded at the end of February, by a meeting of the Council's Scientific Committee. It was attended by representatives from the United Kingdom as well as from the British West African Territories. Agreement was reached on a number of matters of joint interest to the British West African Governments in the field of future development, and the continued re-organisation of previously existing research facilities.

Medical Research is carried out in the Gold Coast at the Medical Research Institute at Accra and in the field, especially in conjunction with the Medical Field Units. At the Institute, the research has covered a wide variety of subjects, and has included investigation in the Sickle-cell Trait and Sickle-cell Anaemia, Typhus and Typhoid Fevers, etc. These investigations have been recorded in a number of scientific papers published by members of the staff. As regards Field Research Work, the Nosological Survey which had been in progress at Mirigu in the Northern Territories for more than two years was completed, as was the Malacological Survey which began in 1952: reports on these surveys are now being compiled. The Tuberculosis Specialist continued his investigations into the prevalence of "false-positive" or non-specific Tuberculosis reactions, as a result of which some valuable information was obtained.

APPENDIX A

MEDICAL AND HEALTH STAFF—1954

	Govt.	Mission	Private	Notes
1. Registered Physicians with degrees recognised in the United Kingdom:				
(a) Government Officers holding administrative or specialist posts	22	—	—	The services of some of the medical practitioners employed by mining companies are made available to Government. One private practitioner is employed by Government on a sessional basis. There are also 14 Military Medical Officers.
(b) Other Government and non-Government Physicians	81	6	12	
Licensed Physicians with degrees which are not registrable in the United Kingdom	23	10	10	
Dental Surgeons	7	—	4	There are also 2 Military Dental Surgeons.
2. Nurses whose training was equivalent to that provided in the United Kingdom	144	11	54	
Nurses with certificates recognised locally but not in the United Kingdom	735	26	377	
Nurses in Training	481	146*	—	* Combined figure.
3. Midwives whose training was equivalent to that provided in the United Kingdom	53	30	31	
	Of these the following are included in the number shown in paragraph 2 above of Nurses whose training was equivalent to that provided in the United Kingdom.			
	53	11	20	
Midwives with certificates recognised locally but not in the United Kingdom	267	4	152	
	Of these the following are included in paragraph 2 above.			
	214	—	—	
Midwives in Training	114	12	—	
4. Sanitary Staff	181	Not available		
5. Laboratory and X-Ray Technicians	72	Not available		
6. Pharmacists	104	1	178	

REPORT OF THE MINISTRY OF HEALTH

Part II

REPORT

of the

Chief Medical Officer

on the

State of the Public Health during 1954

REPORT OF THE SECRETARY OF HEALTH

Part II

REPORT

1901

John M. McKim

State of the Union

CONTENTS

Chapter	Page
INTRODUCTION	16
I VITAL STATISTICS	
(i) General	18
(ii) The Expatriate Population	18
(iii) Registration of Births and Deaths	18
(iv) Invalidings of Special Groups of Population	19
(v) Mortality	20
(vi) Notifiable Diseases	22
(vii) Morbidity	22
II GENERAL EPIDEMIOLOGY	
(i) Tuberculosis	23
(ii) Venereal Diseases	23
(iii) The Typhoid and Paratyphoid Fevers	24
(iv) Brucellosis	25
(v) The Dysenteries	25
(vi) Streptococcal Sore Throat	26
(vii) Diphtheria	26
(viii) Whooping Cough	26
(ix) Meningococcal Infections	26
(x) Tetanus	26
(xi) Anthrax	26
(xii) Acute Poliomyelitis	26
(xiii) Acute Infectious Encephalitis	26
(xiv) Late Effects of Acute Poliomyelitis and Acute Infectious Encephalitis	26
(xv) Smallpox	26
(xvi) Measles	26
(xvii) Yellow Fever	27
(xviii) Infectious Hepatitis	27
(xix) Rabies	27
(xx) Malaria	27
(xxi) Diseases of the Respiratory System	27
(xxii) Chickenpox	27
(xxiii) Yaws	27
(xxiv) Trypanosomiasis	28
OTHER IMPORTANT DISEASES	
(xxv) Blackwater Fever	28
(xxvi) Schistosomiasis	28
(xxvii) Onchocerciasis	28
(xxviii) Loiasis	28
(xxix) Filariasis Bancrofti	28
(xxx) Unspecified Filariasis	29
(xxxi) Hookworm	29
(xxxii) Tape Worm	29
(xxxiii) Ascariasis	29
(xxxiv) Guinea worm ,	29
(xxxv) Relapsing Fever	29
(xxxvi) Trachoma	29
(xxxvii) Scabies	29
(xxxviii) Malignant Neoplasms	29
(xxxix) Benign and Unspecified Neoplasms	30
(xl) Non-toxic Goitre	30

CONTENTS—*contd.*

Chapter	Page
II— <i>contd.</i>	
(xli) Thyrotoxicosis with or without goitre	30
(xlii) Diabetes Mellitus	30
(xliii) Nutritional deficiency diseases	30
(xliv) The Anaemias	30
(xlv) Asthma	30
(xlvi) Non-meningococcal Meningitis	30
(xlvii) Epilepsy	30
(xlviii) Hypertension	30
(xlix) Appendicitis	30
(i) Intestinal obstruction and Hernia	30
(ii) Gastro-Enteritis and Colitis ages 4 weeks to 2 years	31
(iii) Cirrhosis of the Liver	31
(liii) Chronic Ulcer	31
ACCIDENTS	31
III GENERAL HOSPITAL SERVICES	
(i) Work done in Hospitals	32
(ii) Attendance of Children at Hospitals	32
(iii) Utilisation of Hospital Beds	32
(iv) New Hospitals under construction in 1954	33
(v) Extensions and alterations to existing Hospitals	33
IV SPECIALISED UNITS IN THE HOSPITAL SERVICES	
(i) The Medical Unit, Gold Coast Hospital	34
(ii) The Surgical Unit, Gold Coast Hospital	34
(iii) The Surgical Unit, Kumasi Central Hospital	35
(iv) The Ophthalmic Unit, Gold Coast Hospital	35
(v) The Ophthalmic Unit, Kumasi Central Hospital	35
(vi) The Ear, Nose and Throat Unit, Gold Coast Hospital	36
(vii) The Specialist Anaesthetist, Gold Coast Hospital	36
(viii) The X-ray Services	
(a) General	36
(b) Physiotherapy	37
(ix) The Dental Service	39
(x) The Hospital Welfare Service	39
V GENERAL PUBLIC HEALTH	
(i) General Comments	40
(ii) Mosquito Control	40
(iii) General Sanitation	40
(iv) Measures against Smallpox	41
(v) Measures against Plague	41
(iv) Measures against Rabies	41
(vii) Preventible Illness	42
(viii) Housing	42
(ix) Food in Relation to Health and Disease	42
(x) Nutrition	42
(xi) School Hygiene	42
(xii) Port Health ..	
(a) Seaports	43
(b) Airports	43
(xiii) Outbreaks of Epidemic Disease	
(a) Yellow Fever	43
(b) Cerebro-spinal Meningitis	44
(c) Smallpox	44
(xiv) Prisons	44
VI MEDICAL FIELD UNITS	
(i) Introduction	46
(ii) Trypanosomiasis	47
(iii) Yaws	52
(iv) Leprosy	53
(v) Onchocerciasis	54

CONTENTS—*contd.*

Chapter		Page
VI— <i>contd.</i>	(vi) Guinea-Worm	55
	(vii) Bilharzia	55
	(viii) Hookworm	56
	(ix) Epidemic Diseases and Vaccination	56
	(x) Statistics	57
VII	LABORATORY SERVICES	
	(i) Medical Research Institute	
	(a) Buildings and Equipment	58
	(b) Scientific Activities	58
	(c) Bacteriology Division	58
	(d) Biochemical Division	62
	(e) Haematology Division	63
	(f) Pathology Division	64
	(ii) Government Chemical Laboratory	65
VIII	RESEARCH INTO MALARIA CONTROL	67
IX	SCHISTOSOMIASIS	72
X	THE MENTAL HEALTH SERVICE	80
XI	THE LEPROSY SERVICE	82
XII	MATERNITY AND CHILD WELFARE SERVICES	
	(i) Maternity	83
	(ii) Child Welfare	83
XIII	TRAINING OF MEDICAL AUXILIARIES	
	(i) Overseas Training Schemes	88
	(ii) Local Training	88
XIV	STATUTORY BOARDS	
	(i) Pharmacy and Poisons Board	90
	(ii) Midwives Board	90
	(iii) Nurses Board	90
XV	WORK DONE IN RURAL DRESSING STATIONS	91
XVI	VISITORS	92
	APPENDIX "A" (to Chapter I VITAL STATISTICS) Tables I to XXXIX	93
	APPENDIX "B" (to Chapter II, GENERAL EPIDEMIOLOGY) Tables XL to LI	111
	APPENDIX "C" (to Chapter III, GENERAL HOSPITAL SERVICES) Tables LII to LV	116
	APPENDIX "D" (to Chapter V, GENERAL PUBLIC HEALTH) Tables LVI to LXIV	117
	APPENDIX "E" (to Chapter VI, MEDICAL FIELD UNITS) Tables LXV to LXXXVIII	122
	APPENDIX "F" (to Chapter VII, LABORATORY SERVICES)	126
	APPENDIX "G" (to Chapter IX, SCHISTOSOMIASIS)	129
	APPENDIX "H" (to Chapter X, THE MENTAL HEALTH SERVICE) Tables LXXIX to LXXXI	138
	APPENDIX "I" (to Chapter XII, MATERNITY AND CHILD WELFARE SERVICES) Tables LXXXII to XCI	140
	APPENDIX "J" (to Chapter XIII, TRAINING OF MEDICAL AUXILIARIES) Tables XCII to XCVII	143
	APPENDIX "K" SCIENTIFIC PUBLICATIONS DURING 1954 BY STAFF OF THE MINISTRY OF HEALTH	145
	APPENDIX "L" SPECIAL CONTRIBUTORS TO THE ANNUAL REPORT, 1954	145
	RETURNS OF DISEASES AND DEATHS (IN-PATIENTS) AND DISEASES (OUT-PATIENTS) FOR THE YEAR 1954.	
	"A" HOSPITALS	146
	"B" INFANT CLINICS	151
	"C" MISSION AND GOVERNMENT HEALTH CENTRES	156
	"D" ISOLATION HOSPITALS	161
	"E" H. M. PRISONS	162
	"F" EXTRACTS FROM RETURNS OF CASES TREATED AT RURAL DRESSING STATIONS	166

The Report of the Chief Medical Officer on the state of the Public Health for the year ended 31st December, 1954

INTRODUCTION

*To THE HONOURABLE IMORU EGALA, M.L.A.
MINISTER OF HEALTH.*

Sir,

I have the honour to submit a report on the state of the public health in the Gold Coast and Togoland under United Nations Trusteeship during 1954. This is the second report of the present series, and forms the second part of the Annual Report of the Ministry of Health for the year ended December 1954.

The form of the report has been modified by the sub-division of Return "A", the return of diseases and deaths, into a number of statistical returns according to the type of institution providing the returns. This enables the returns from hospitals to be separately shown, and thus provides statistics which are reasonably accurate for those institutions in which diagnoses are made by medical practitioners. In previous years Return "A" has included diagnoses made at all institutions including those supervised by medical auxiliary staff.

Chapter I of the report deals with the Vital Statistics of the Gold Coast during 1954. The difficulties in obtaining accurate population figures are referred to; there is some doubt as to the value of a decennial census in the Gold Coast where rapid development and modernisation is proceeding, and land borders are largely un-controlled, allowing immigration and emigration to proceed without the type of frontier control found in European countries. Such a census provides information about population state at the time of the count, but its value as a figure on which to assess population increases or decreases is open to doubt. Reasonably accurate figures are available for the expatriate population, and in the current report are of some interest; the increasing number of women and children as also the number of expatriate births during the year provide an indication of the confidence felt overseas in the standards of medical care and public health provided in the Gold Coast.

The differences in the causes of invaliding as between official and non-official Europeans is very marked, and would suggest that a more careful screening of European recruits to the Civil Service is required. Allowing for differences in their responsibilities and conditions of employment, the incidence of invalidings on account of Psychosis and Psychoneurosis diseases amongst European officials during the period 1950-1954 remains too high.

Chapter II deals with the incidence of a number of important diseases diagnosed at hospitals in the Gold Coast. The incidence of Respiratory Tuberculosis continues to cause concern to medical staff, and investigation of the methods of control and treatment of the disease were continued by the Tuberculosis Specialist. The incidence of Typhoid and Paratyphoid Fever also gave rise to concern during 1954, a steady increase in numbers of cases being reported during the year. The number of malignant neoplasms reported during 1954 showed an increase of 74 per cent on 1953 figures, malignant neoplasms of the uterus and cervix being the principal cause of morbidity. This increase probably reflects a greater confidence in the hospital services rather than an absolute increase in the incidence of such conditions.

Chapter III provides information concerning the Hospital services generally, including progress on the construction of new hospitals as well as reconstruction, and additions and alterations to existing hospitals.

Chapter IV presents reports on the various specialised units in the hospital services, and the measures taken by specialists to combat specific conditions which caused them concern during the year. It also includes the report on the Hospital Welfare Service.

Chapter V deals with the state of public health and the environmental services. It cannot be said that the overall picture is particularly satisfactory, and the planning and implementation of long-term measures are essential if the health standards of the population are to be raised; the curative services in the Gold Coast remain over-crowded with cases of disease which on a long term basis are preventable by the application of well-tried public health measures. The establishment of a school medical service remains an urgent necessity.

Chapter VI contains the report of the Medical Field Units, and Chapter VII the report of the Laboratory Services. Part (ii) of this chapter contains the report of the Government Chemist and indicates the increasing incidence of prosecutions for the possession of Indian Hemp, addiction to which may in future years prove to be a serious social problem in the Gold Coast.

Chapter VIII contains the report of the Malaria Investigation into the incidence of malaria in the Gold Coast, and the possibility of introducing effective methods of malaria control.

Chapter IX contains the report of the Medical Biologist and is concerned with the identification and dispersal of vectors of Schistosomiasis.

Chapter X presents an account of the Mental Health Service and Chapter XI a report on the Leprosy Service. Chapter XII gives an account of the Maternity and Child Welfare Services in the Gold Coast, including a report on the Health Visiting Service. Chapter XIII provides information on the training of staff, both locally and overseas, for the Ministry of Health, and Chapter XIV details the activities of the Statutory Boards concerned with the professional regulation and discipline of medical auxiliary staff.

It now remains for me to express my gratitude to the members of the medical services of the Government Missions and Mines who have worked with the Ministry of Health throughout the year and have made their contribution to the work which this report records. To the Registrar General, the Government Statistician whose assistance was freely provided and whose reports were made available to the Ministry, thanks are due for the collaboration they have given. This report is the work of a number of units; the names of specialised officers who have contributed to it will be enumerated in the appendices, but others must, perforce, remain anonymous. I remain responsible for the report as a whole and concur with the views expressed therein.

I have the honour to be,

Sir,

Your obedient Servant,

E. W. Q. BANNERMAN
Acting Chief Medical Officer

CHAPTER I

VITAL STATISTICS

(i) GENERAL

All tables of statistical data referred to in this Chapter will be found in Appendix "A".

The estimated African population of the Gold Coast and Togoland under United Nations Trusteeship at the middle of 1954 was 4,536,000, an increase of 68,000 compared with 1953. Of the estimated total in 1954, 2,293,000 were males and 2,243,000 were females, the male excess of 50,000 being a little less than in 1953.

The assessment of immigration and emigration of the large floating population of Africans across the Gold Coast frontiers is not possible; frontier control posts exist only at certain points on the frontiers, and between these posts are innumerable bush paths giving free access between the Gold Coast and neighbouring territories. A further difficulty in the assessment of population movement is due to the fact that existing frontiers bisect many native states, leaving a Paramount Chief in one Territory and in some cases a large population who owe him allegiance in the adjacent one. When there is no Paramount Chief, a tribal group is sometimes bisected by a frontier. In the Northern Territories, the movement of the Konkomba peoples across the border from French Togoland under United Nations Trusteeship into Dagomba was virtually completed during 1954. The movement of this nomadic tribe across the Gold Coast frontier had been proceeding for several years.

The population of British Togoland under United Nations Trusteeship at the middle of 1954 was estimated at 422,700, consisting of 214,100 males and 208,600 females.

The expatriate population of the Gold Coast at 31st December, 1954 is shown in Table II. The main group resident in the Gold Coast were made up of 9,039 British, 1481 other Europeans, 1,430 Syrians and Lebanese, 487 Indians and Pakistanis, and 248 United States Americans. Table III records the arrivals and departures during 1954 of non-natives of the Gold Coast; during 1954 there was an excess of arrivals over departures of 275 women and 182 children. No accurate population figures for the Gold Coast are available for 1954; the 1948 census no longer gives an adequate guide to the population; it is thought that the number of major development projects being undertaken under the auspices of the Government will have increased very considerably the immigrant African population.

(ii) THE EXPATRIATE POPULATION

Table IV records by occupation the numbers of non-official Expatriate males resident in the Gold Coast in 1954, and Table V shows the incidence of invalidings, births and deaths since 1950 in the general European population. The numbers resident increased from 6,507 in 1950 to 10,520 in 1954, there being an overall increase in official Europeans from 1135 in 1950 to 2,081 including 731 contract officials in 1954, and in non-official Europeans from 5,372 in 1950 to 8,439 in 1954; concomitant with this increase in the general European population, there has been a decline in the official pensionable European population from 1691 in 1953 to 1350 at the end of 1954. The figures given in Table II for women and children include the wives, children, and other relations of European officials who were resident in the Gold Coast.

The 1954 figures are derived from official records of immigration and are reasonably accurate, but the 1953 figures were derived from returns the nature of which left considerable scope for error and which have since been abandoned on this account.

Table VI shows the incidence of births and deaths in the expatriate non-European population in 1954, including Americans, this group being territorially non-European.

Table VII records the nationality of expatriate births registered in the Gold Coast during 1954. The United Kingdom group was the largest with 151 births, followed by Lebanese (69 births), Indian and Pakistani (10 births), Syrian (9 births) French (8 births) Swiss (8 births) and United States Americans (5 births).

(iii) REGISTRATION OF BIRTHS AND DEATHS

Registration of Births and Deaths is carried out in 36 Registration Areas in the Gold Coast under the auspices of the Gold Coast Government. There was no extension of direct registration during 1954 by the Registrar-General but Local Authorities made by-laws for registration of births and deaths under Part VII of the Local Government Ordinance, this being a function provided for in the Instrument which established those authorities. Supervision of registration by Local Authorities was carried out by the Registrar-General's department, who also received the returns for the year. These were not available when this report was written.

Table VIII records the number of births and deaths occurring in the 36 Registration areas by Regions in 1954 and also shows separately the figures for British Togoland under United Nations Trusteeship. Table IX gives a summary by sex of registered births and deaths in the population, within the 36 registration areas and compares the 1954 figures with those for 1953. The number of births increased from 18,181 in 1953 to 19,600 in 1954, the increase being made up of 834 African and 8 non-African male births, together with 572 African and 6 non-African female births. Deaths registered during the year numbered 11,025 as compared with 10,720 in 1953 there being an increase of 238 African male deaths and 75 African female deaths. Non-African male deaths decreased from 44 in 1953 to 35 in 1954. Non-African female deaths remained at 10 during 1954, the number being the same as for 1953.

Table X gives a summary of live birth, still-birth, and death rates, including neonatal infantile mortality and maternal mortality rates, from 1950. The live birth rate per 1000 population of all registration areas was 37.4 in 1954 as compared with 35.3 in 1953, whilst the still-birth rate per 1000 total live and still births was 78.0 in 1954 as compared with 73.0 in 1953. The death rates were 21.1 per 1000 population of the 36 registration areas in 1954 and 20.8 in 1953. The neonatal mortality rate per 1000 related live birth for 1954 was 63.0; no records for previous years are available. The infantile mortality rate was 119 per 1000 related live births in 1954 as compared with 113 in 1953. The maternal mortality rate was 21.0 per 1000 live and still births, no figures being available for previous years. Table XI gives a regional summary of birth, still birth, and death rates for 1954, including neonatal, infantile and maternal mortality rates. Allowing for discrepancies and inaccuracies, they exhibit a regional variation which information gathered from other sources tends to confirm. The mortality figures are heavily weighted by the fact that hospitals are situated in the majority of registration centres, and persons from places outside the registration areas are received in them. When such persons die their deaths are registered in that centre, and no method exists whereby such death registration can be transferred.

Table XII gives the age and sex distribution of registered deaths from all causes in the 36 registration areas of the Gold Coast for the period 1950-1954. There is no substantial change to record in the general pattern of deaths revealed in this table. The majority of deaths occur within the first year of life, in early childhood, or in young adult life.

(iv) INVALIDINGS OF SPECIAL GROUPS OF POPULATION

(a) *European Officials*

The number of European officials, together with the number of invalidings and deaths in this group, is summarised for the period 1950-1954 in Table XIII; the invaliding rates for the years 1950-1954 are shown below.

INVALIDING PER 1000 EUROPEAN OFFICIALS

1950	1951	1952	1953	1954
17.0	11.0	16.0	10.0	7.20

The classified causes of invalidings of European officials are summarised for the period 1950-1954 in Table XIV and detailed in full in Table XV.

Over the 5-year period, the chief causes of invaliding has been Psychosis and Psychoneurosis (30 cases). These conditions far outstrip in numbers any other cause of invaliding. In 1954, psychoneurotic illness (5 cases) was the main cause of invaliding, followed by 3 cases of muscular weakness or paralysis which in 2 cases were probably caused by acute anterior poliomyelitis whilst in 1 case the diagnosis was specifically stated to be anterior poliomyelitis.

(b) *Non-official Europeans*

Statistics of invaliding of non-official Europeans are summarised for the period 1950-1954 in Table XVI. The invaliding rates for non-official Europeans are summarised below:—

INVALIDING RATES PER 1,000 NON-OFFICIALS

1950	1951	1952	1953	1954
3.7	4.7	2.9	0.7	1.18

These figures are maintained at a satisfactory low level. The invaliding of women and children, who comprise nearly half the total figures of 8,439 non-official Europeans, appears to be infrequent.

Table XVII gives the classified causes of invaliding of non-official Europeans for the period 1950-1954. Over this period the primary causes of invaliding have been Diseases of the Digestive system (12 cases), and Respiratory Tuberculosis, (11 cases). Psychoneurotic illness in this group accounted for only 4 cases. Detailed causes of invaliding of non-official Europeans in 1954 are given in Table XVIII. Ten cases were invalided in 3 of which the diagnosis referred to the digestive system.

The difference in the causes of invaliding of the two European populations is a striking one which requires evaluation.

The invaliding rates for the general European population for the period 1950-1954 are shown below:—

INVALIDING RATES PER 1,000 RESIDENT EUROPEANS

1950	1951	1952	1953	1954
5.99	6.08	5.92	2.92	2.38

(c) *Other Expatriate Groups*

It was not found possible to provide details of the invalidings amongst this group of the population during 1954.

(d) *African Officials*

A summary showing the number of African Officials on the pensionable establishment (including pensionable officers in the Railways Administration) is shown in Table XIX. It is noteworthy, that although the pensionable establishment of African and European Senior Civil Servants is rapidly approaching equality of numbers, there were no invalidings of African Senior Civil Servants during 1954. The following table shows the position of the 2 groups of Senior Civil Servants in respect of invalidings and deaths in 1954.

Group	Establishment	Invalidings	Deaths
European ..	1,350	15	3
African ..	1,043	—	—

The number of Africans on the pensionable establishment of the Gold Coast Government increased from 11,597 in 1953 to 12,961 in 1954, an increase of 1,364; the pensionable African establishment of the civil service was 6,286 in 1946, and since that period has been more than doubled in numbers.

The invaliding rates for the period 1950-1954 are shown below.

INVALIDING RATES PER 1,000 AFRICAN OFFICIALS

1950	1951	1952	1953	1954
6.35	4.35	4.7	5.7	3.47

Table XX indicates the Government Departments to which invalided officials belonged. It will be noted that the Railways administration accounted for 12 officials invalided.

The classified causes of invalidings of African officials between 1950 and 1954 are summarised in Table XXI. The principal causes over this period were:—

Respiratory Tuberculosis	45 cases
Psychotic and Psychoneurotic illness	36 cases
Hypertension	34 cases
Diseases and conditions of the eyes	28 cases
Diseases of the heart (excluding hypertension)	19 cases
Accidents and injuries	8 cases

Detailed causes of invalidings of African officials in 1954 are contained in Table XXII. Diseases and conditions of the eyes were the primary cause (7 cases) followed by Psychotic and Psychoneurotic conditions (5 cases), Hypertension (5 cases), Pulmonary Tuberculosis (4 cases), and Cerebral vascular accidents (3 cases).

(v) MORTALITY

Table XXIII lists the classified twelve principal causes of mortality in Gold Coast hospitals during 1954 in order of importance. Malaria (all types) was the principal cause of death in 1954, there being 269 deaths listed under this heading. In 1953, Malaria was 6th in order of importance. "All other diseases of the genito-urinary system" (207 deaths) was the next important cause of death, 194 of these being male deaths, followed by "other complications of pregnancy, childbirth, and the puerperium" which accounted for 180 female deaths. Tuberculosis of the respiratory system was the 4th important cause with 165 deaths. In 1953 this was the 2nd important cause with 132 deaths. Broncho pneumonia (164 deaths) was the 5th important cause; in 1953 this was the principal reported cause, with 143 deaths. Tetanus, which in 1953 was the 3rd important cause (97 deaths) was in 1954 the 6th important cause with 121 deaths.

Motor vehicle accidents, which in 1953 accounted for 44.73 per cent of all accidental deaths, in 1954 were responsible for 40.20 per cent of all accidental deaths.

Table XXIV gives the number of deaths per 1,000 registered deaths from Respiratory diseases (excluding tuberculosis), Intestinal diseases, Malaria, and Neoplastic diseases in 1954 and compares them with those for 1950-1953. It also gives the number of deaths registered as due to starvation in the same period.

DEATHS IN SPECIAL GROUPS OF THE POPULATION

(a) *Causes of deaths in European Officials*

Table XIII gives the number of deaths of European officials for the period 1950-1954, and Table XXV gives the classified causes of death for the same period. Heart diseases accounted for 4 deaths during this period, and accidental causes for 5 deaths. Detailed causes of deaths for 1954 are set out in Table XXVI. There were only 3 deaths, one of these being a suicide.

(b) *Causes of deaths of Non-official Europeans*

Table XXVII gives the number of deaths of non-official Europeans during the period 1950-1954. The majority of deaths occurred amongst the Merchant and Mining Communities; the incidence of deaths of children increased from 4 in 1953 to 9 in 1954. At the same time it must be remembered that the number

of European children in the Gold Coast has shown a marked increase during 1954. The classified causes of deaths of non-official Europeans from 1950-1954 are set out in Table XXVIII. In order of importance, the main causes of death were:—

Malaria and Blackwater Fever	14 cases
Respiratory diseases (excluding Tuberculosis)	9 cases
Accidents	9 cases
Disease of the Digestive System	7 cases
Heart disease	7 cases

There were also 3 cases of acute anterior poliomyelitis, and one case of diphtheria which terminated fatally. Table XXIX records the detailed causes of death during 1954.

(c) *Causes of deaths of other expatriates*

Table XXX sets out the number of deaths occurring in the Levantine, Asiatic, American, and West Indian communities, according to occupation, and Table XXXI gives the classified causes of death in these communities for 1953-1954. Table XXXII gives the detailed causes of death for 1954. Table XXXIII gives the causes of death amongst expatriate infants by Nationality, occurring during 1954. Fifteen out of a total of 34 expatriates deaths occurred amongst children under 2 years of age.

(d) *Causes of death of African officials*

Table XIX gives the number of African official deaths for 1954, and Table XXXIV gives the classified causes of death for the period 1950-1954. The most important causes of death during the 5-year period were:—

Cerebral Vascular Accidents	14 cases
Diseases of the Digestive System	11 cases
Respiratory Tuberculosis	9 cases
Respiratory Diseases excluding Tuberculosis	7 cases
Typhoid and Paratyphoid Fevers	6 cases
Malignant Neoplasms	6 cases
Diseases of the Heart	6 cases
Hypertension	6 cases
Nephritis	6 cases
Tetanus	5 cases

Table XXXV gives the detailed causes of death in 1954 for African officials.

MATERNAL MORTALITY RATE

Table XXXVI gives the maternal mortality rate in the 36 registration areas for the year 1950 to 1954. There is no evidence of any improvement in the over-all rate, which continues to fluctuate. In Table XXXVII the over-all Gold Coast rate is compared with the rates reported from the Regions.

INFANT AND CHILD MORTALITY

The position is summarised for the period 1950-1954 as below:—

INFANTILE MORTALITY RATE

1950	1951	1952	1953	1954
122	117	125	113	119

These figures may be compared with those obtained 20 years ago, which are as follows:—

INFANTILE MORTALITY RATE

1930	1931	1932	1933	1934
116	114	102	100	105

It will be observed that there appears to have been no real improvement in the Infantile Mortality Rate during the past 20 years, but under the present limitations governing registration of deaths it is impossible to deduce an infantile mortality rate which may be said to be representative of the position throughout the Gold Coast as a whole.

(vi) NOTIFIABLE DISEASES

Table XXXVIII records the incidence of certain notifiable diseases during 1954; these diseases are discussed in greater detail in the next chapter of this report. There were no cases of Plague, Cholera, or louse borne Typhus notified during the year, but one confirmed case of Yellow Fever occurred near Tamale in the Northern Territories.

Difficulty continues to be experienced in obtaining notification of diseases, and there continues to be a considerable difference between notifiable diseases reported as occurring at hospitals, and those actually notified from Medical Officers of Health. Very few general practitioners notify diseases which occur in their practices. It will be observed, that there is a discrepancy between the number of deaths due to Respiratory Tuberculosis reported earlier in this chapter under Causes of Death, and that shown in Table XXXVIII. This is due to notifications received from private hospitals which do not submit detailed returns of cases treated during the year.

(vii) MORBIDITY

All references in this section are to in-patient cases only, and also include cases still in hospital at the end of 1953. The 15 principal causes of sickness in Gold Coast Hospitals are enumerated in Table XXXIX.

The most important cause of morbidity in 1954 was malaria, with 7,000 cases treated. In 1953 malaria was also the principal cause, with 5,486 cases treated. Chronic ulcer declined from 2nd main cause in 1953 to 9th main cause in 1954, its place as 2nd main cause being taken by the group of conditions classified as "other complications of pregnancy, child-birth, and the puerperium". Lacerations and Open Wounds comprised the 3rd main cause of morbidity, followed by Intestinal Obstruction and Hernia, and Abortion without mention of Sepsis as 4th and 5th main causes. These three conditions were also 3rd, 4th and 5th main causes in 1953. Tuberculosis of the respiratory system rose from 14th main cause in 1953 to 12th main cause in 1954.

Malignant neoplasms rose from 15th main cause in 1953 to 11th main cause in 1954, there being an increase of 78.3 per cent in these conditions undergoing in-patient treatment.

Section "B" Table XXXIX indicates the 9 main causes of morbidity arising from accidental causes in 1954. It will be observed that motor vehicle accidents continued to be the principal cause with 2,867 cases as compared with 1953 when there were 1,793 cases, there being an increase in 1954 of 1,074 cases.

CHAPTER II

GENERAL EPIDEMIOLOGY

The statistics of diseases discussed in this chapter are derived from hospital returns only and are exclusive of cases seen at clinics and dressing stations. They represent, therefore, cases which have been diagnosed and treated by Medical Officers on and after January 1st, 1954. The tables referred to will be found in Appendix "B". In the 1953 report, cases seen at the children's hospitals in Accra and Kumasi were also included in this section; in the present report cases from these two hospitals are considered in the chapter on Child Welfare. In reading this chapter, therefore, and in considering comparisons with 1953, this fact must be borne in mind.

(i) TUBERCULOSIS

(a) *Respiratory Tuberculosis*

Three thousand five hundred and three cases received treatment in Gold Coast hospitals during 1954, including 1,077 in-patients. Table XL gives the number of deaths and the proportional mortality rates from Respiratory Tuberculosis for the period 1950-1954 as reported from the country's 36 registration areas. The steady decline in mortality referred to in the 1953 report has continued during 1954 in so far as returns from these areas are concerned.

Table XLI provides similar information in respect of hospital in-patients as a check on the proportional mortality rate for registration areas. They suggest that the downward trend of mortality has been checked during 1954. The factors affecting the treatment which were discussed in the 1953 report have continued to operate during 1954. In some areas, institutions and individual practitioners have taken a particular interest in the treatment of respiratory tuberculosis and have attracted large numbers of sufferers from this complaint. A serious danger exists of the rapid development of resistant strains due to the non-selective use of chemotherapy.

Table XLII gives a classification of notified cases according to certain broad classes of occupation and status. Whilst this remains incomplete due to lack of notification in the proper form, it is apparent that the majority of cases occur in the following groups in order of importance:—

- Urban Labouring classes 394 cases (83 deaths)
- Farm workers and Fishermen 280 cases (52 deaths)
- Children between ages 1-16 years 261 cases (15 deaths)

Although there were 114 cases (18 deaths) in clerical grades it was very noticeable that the incidence amongst the higher social grades represented by the group headed "Administrative and professional" was very low indeed. Such persons may attend private practitioners, and these only very infrequently notify cases of infectious disease.

(b) *Non-Respiratory Tuberculosis*

1,690 cases of non respiratory tuberculosis were diagnosed in Gold Coast Hospitals during 1954. Of these 388 received in-patient treatment, and 48 deaths were reported. These figures compare with a total of 431 cases treated in 1953, of which 244 received in-patient treatment, and 30 deaths were reported. This increase in cases is due to improvement in diagnostic facilities and to the establishment of a Tuberculosis and an Orthopaedic treatment service in Accra, where the majority of cases were diagnosed and received treatment. Table XLIII classifies the type of non-respiratory Tuberculosis as reported from a number of hospitals. Apart from the large miscellaneous group "all other forms" (1,109 cases) it will be observed that Tuberculosis of the bones and joints provides the majority of cases (316 cases) with Tuberculosis of the intestines peritoneum and mesenteric glands coming next in importance (121 cases).

(ii) VENEREAL DISEASES

(a) *Syphilis*

1,777 cases of syphilis were diagnosed during the year, of whom 191 received in-patient treatment. These figures compare with 1,858 cases diagnosed in 1953 of whom 110 received in-patient treatment. 4 deaths were reported during 1954, as compared with 3 during 1953. During 1954 there were 125 male in-patient cases (3 deaths) and 60 female in-patient cases (1 death) admitted for treatment exclusive of cases remaining from 1953.

(i) *Congenital Syphilis*.—This condition was diagnosed at more centres than in the previous year, the total number of cases being 195, made up of 91 males and 64 females.

(ii) *Early Syphilis*.—A total number of 149 cases were reported during 1954, made up of 115 males and 34 females. This compares with a total of 166 reported in 1953.

(iii) *Late Syphilis*.—16 cases only were reported in 1954, made up of 15 male and 1 female. Of these, 9 males were returned as cases of General Paralysis of the Insane. In 1953 90 cases of Late Syphilis were reported.

(iv) *All other Syphilis*.—1,457 cases were classified in this group in 1954, made up of 840 males and 611 females, admissions during the year, and 6 cases remaining from 1953. This compares with 1,901 cases reported in 1953.

(b) *Gonorrhoea*

The rising incidence of Gonorrhoea which was reported in 1953 did not continue during the year under review. In 1954 there were 725 in-patients treated (12 deaths) and 7,870 out-patients, as compared with 858 in-patients (6 deaths) and 16,436 out-patients in 1953. Some part of this decrease may be accounted for by more accurate reporting methods brought into use during the year. Allowing for this, however, there was nevertheless a very marked decline in the number of cases reporting at hospitals for treatment amounting to over 50 per cent of the 1953 total figures. This decline is difficult to account for but may be due to an increase in the number of private medical practitioner clinics in rural areas and in large centres such as Kumasi, as also to the fact that penicillin has become more freely available during the year at lower prices than has hitherto been the case. The increasing use of penicillin in the campaign against yaws may also have played an incidental part in the reduction of the incidence of Gonorrhoea in rural areas. The following table indicates the relative numbers of each sex reporting for treatment over the period 1950-1954 :-

Year	Males seeking treatment	Females seeking treatment	Total
1950	13,137	4,328	17,465
1951	11,629	4,043	15,672
1952	10,235	2,713	12,948
1953	14,639	2,637	17,276
1954	6,332	2,263	8,595

There has been no indication during the year of a resistant strain appearing, the possibility of which was discussed in the 1953 report. It is noteworthy from these figures that the decline has been mainly in the number of males reporting for treatment, whereas the numbers of females reporting has declined only slightly. This may be accounted for by the difference in symptomatology. It will be of interest to observe the regional effect on the incidence of Gonorrhoea as the treatment of yaws with penicillin becomes more widespread, and as mass campaigns against this disease are more widely initiated. It is also worth recording that Medical Officers in the Northern Territories during 1954 have been practically unanimous in reporting that Gonorrhoea presents little problem amongst the local population but is found mainly amongst lorry drivers, itinerant peddlers and migrant labourers returning from Kumasi and the South.

(c) *Lymphogranuloma Venereum*

210 cases were diagnosed during the year of which 49 received in-patient treatment, and there were no deaths. These were made up of 186 males and 23 females, together with 1 case remaining from 1953; 41 males and 8 females received in-patient treatment.

(d) *Granuloma Inguinale*

286 cases were diagnosed during 1954, of which 76 received in-patient treatment, and there were no deaths. These cases were made up of 242 males and 43 females, together with 1 case remaining from 1953; 57 males and 18 females received in-patient treatment.

(e) *Other Venereal Diseases*

A total of 1,694 cases were diagnosed during 1954 of which a total of 198 (10 deaths) received in-patient treatment. The in-patient cases were made up of 146 males and 47 females, together with 5 cases remaining from 1953. This unqualified group of venereal diseases includes such conditions as non-specific urethritis and *Trichomonas Vaginalis* infections.

For the purposes of the 1953 annual report, *Lymphogranuloma Venereum* and *Granuloma Inguinale* were included in the general heading of "Other Venereal Diseases". Detailed comparisons of these conditions with figures obtained in 1953 are therefore not available in the current year. No cases of *Lymphogranuloma Venereum* were diagnosed at hospitals in the Eastern Region or in Accra during 1954. In respect of *Granuloma Inguinale*, the highest incidence occurred in Ashanti (102 cases), with the Northern Territories (61 cases) and the Western Region (58 cases) next out of a total of 286 cases diagnosed. Only 3 cases were diagnosed at Accra Hospitals during 1954.

Table XLIV shows the work done during 1954 at the Special Diseases Clinic, Takoradi, the main function of which is to provide treatment for venereal diseases to seamen and harbour personnel.

(iii) THE TYPHOID AND PARATYPHOID FEVERS

501 cases of Typhoid (32 deaths) and 138 cases of Paratyphoid (8 deaths) were diagnosed and received in-patient treatment during 1954, compared with 333 cases of Typhoid (26 deaths) and 69 cases of Paratyphoid (5 deaths) in 1953. The total number of cases including out-patients of Typhoid and Paratyphoid together was 739, as compared with 436 cases in 1953. Of these, the greatest number 259 was diagnosed in Accra. The Western Region returned 171 cases, and the Eastern region 130 cases. Out-patient cases are those which for various reasons could not be admitted to, or refused admission to, hospital for treatment.

The following hospital centres provided the highest case incidence of these infection during 1954 :—

Cenntre	Typhoid Fever	Paratyphoid Fever	Total number of cases
Accra	181	78	259
Cape Coast	36	11	47
Sekondi	32	5	37
Oda	37	0	37
Kibi	18	19	37
Ho	30	2	32
Dunkwa	7	25	32
Keta	24	0	24
Koforidua	21	0	21
Winneba	19	1	20

The in-patient figures for the years 1950–1954 exclusive of cases remaining in hospitals at the end of each year, were as follows:—

Year	1950	1951	1952	1953	1954
Number of cases	315	423	354	402	622
Number of deaths	39	56	36	31	40

The rising incidence of Typhoid and Paratyphoid Fevers continued during 1954; since 1946 the number of cases reported has more than trebled. Evidence exists of a large number of "carriers" among the population but no action to deal with such persons is possible and the control of these diseases is hampered by the absence of a comprehensive Public Health Ordinance in the Gold Coast. The incidence is in fact almost certainly higher than is reported in this Chapter, due to inadequate notifications, more particularly by general practitioners. No specific control activities have been attempted during 1954.

(iv) BRUCELLOSIS

Three cases of Brucellosis were admitted to Gold Coast Hospitals for treatment during the year. There were no deaths. These cases were diagnosed at Nsawam, Kibi, and Wa respectively.

(v) THE DYSENTERIES

(a) Bacillary Dysentery

798 cases were treated as in-patients during 1954, with 81 deaths and 1027 out-patient cases were treated at hospitals. This compares with 507 in-patient cases (27 deaths) and 966 out-patients treated during 1953. Of the total of 1825 cases treated in 1954, 638 were in Ashanti and 622 in the Northern Territories.

(b) Amoebic Dysentery

This group includes all forms of amoebiasis. 520 in-patient cases (17 deaths) and 809 out-patient cases were treated during 1954, compared with 531 in-patient cases (24 deaths) and 820 out-patient cases in 1953. Of the total of 1329 cases treated, 512 were in the Northern Territories 338 in Ashanti, and 307 in the Western region.

(c) Unclassified Dysentery

569 cases (29 deaths) received in-patient treatment, and 3,982 cases received out-patient treatment in 1954. This compares with 779 cases (61 deaths) receiving in-patient treatment and 9,141 cases receiving out-patient treatment in 1953. Of the total of 4,551 cases treated, 3,611 were in Ashanti.

The incidence of Dysentery of all kinds remained high in 1954. The following table sets out the number of cases with deaths from all forms of Dysentery treated as in-patients during 1950–1954, exclusive of cases remaining in hospital at the end of each year:—

	BACILLARY DYSENTERY		AMOEBIC DYSENTERY		UNCLASSIFIED DYSENTERY	
	Cases	Deaths	Cases	Deaths	Cases	Deaths
1950	571	31	565	47	178	9
1951	612	29	680	30	493	10
1952	481	15	604	20	251	30
1953	507	27	531	24	779	61
1954	777	81	499	17	559	29

These are diseases of faulty sanitation and poor standards of personal hygiene spread by unclean food handlers, infected vegetables, foodstuffs, and flies; they reflect a low standard of environmental sanitation generally, including a low standard of public health control of restaurants, eating houses, chop bars, and persons engaged in the sale or manufacture of foodstuffs, and ignorance by house-wives of the need for cleanliness in the preparation of food.

170 in-patient cases (1 death) were diagnosed and treated together with 324 out-patient cases during 1954. These were diagnosed on clinical appearances and reaction to treatment. The occurrence of conditions of this nature in the Gold Coast has been a matter for discussion over the years; cumulative evidence would seem to suggest that there is no reason why streptococcal infections should not occur in this form.

10 in-patient cases (2 deaths) were diagnosed during 1954. These were made up of five males (1 death) and five females (1 death). All except one of these cases were treated in Accra. 23 out-patient cases were also recorded for 1954. At one mines hospital, one female in-patient case was recorded, and two male and one female cases were seen as out-patients. Difficulty in obtaining admission of such cases for treatment may occur for a number of reasons, the main one being that patients or their relatives are often reluctant to allow admission.

89 in-patient cases (6 deaths), and 1,631 out-patients were diagnosed and received treatment during the year. In 1953 a total of 3,677 cases were seen both in-patients and out-patients at hospitals; little is known of the incidence of this disease in the Gold Coast, or of the sequelae, particularly amongst children. It is not a notifiable disease, and outbreaks are not therefore reported. General practitioners in rural areas say that it is extremely common.

During 1954 178 in-patients (55 deaths) with 73 out-patients were diagnosed and treated, and seven in-patients remained in hospital from 1953. This compares with 117 in-patient cases (57 deaths) and 164 out-patient cases seen and treated in 1953. No information was available as to how many of these cases were cerebro-spinal meningitis. The possibility of some of these being pneumococcal infections cannot be excluded in the absence of confirmation by lumbar puncture, more particularly in the light of the high mortality amongst in-patients which is not suggestive of cerebro-spinal meningitis.

381 cases (121 deaths) received in-patient treatment in 1954. This compares with 281 cases (97 deaths) in 1953. 173 out-patient cases were also seen in 1954, these being cases who could not for various reasons be admitted to hospital. The rising incidence of this condition, with its high mortality is unsatisfactory; no particular measures aimed at reducing the incidence were taken during 1954, and until there is a marked improvement in sanitary standards throughout the country a high incidence of this disease is likely to persist.

14 in-patient cases (1 death) were diagnosed during 1954, and 5 cases received out-patient treatment only; 1 case remained in hospital from 1953. Of the cases seen, 9 were treated at Tamale Central Hospital, 1 at the Gold Coast Hospital, Accra, (this case died), 4 at Saltpond Hospital, and 5 at the Nandom Clinic attached to Jirapa Hospital in the north-west of the Northern Territories.

26 in-patient cases (2 deaths) and 19 out-patient cases were diagnosed and received treatment in 1954. This compares with 14 in-patient cases (5 deaths) treated in 1953. Regarding the reported out-patient cases, it is probable that some of these were late effects of acute poliomyelitis which were wrongly classified. Of the in-patient cases treated, 3 were reported from the Ridge Hospital, Accra, 8 from the Gold Coast Hospital Accra, 1 from Keta, 11 from Cape Coast, 1 each from Kumasi General Hospital South Wing and North Wing respectively.

14 cases (2 deaths) received in-patient treatment during 1954, and 2 out-patient cases were recorded. Of these, 8 cases (1 death) were males and 6 cases (1 death) were females. The out-patient cases were both females. The cases were reported from Bolgatanga, the Gold Coast Hospital Accra, Axim, Tarkwa, Kumasi General Hospital (South Wing), Agogo, and Obuasi.

During 1954, 15 cases (no deaths) received in-patient treatment and 50 cases were treated as out-patients. The in-patients were made up of 9 males and 4 females; 2 cases also remained under treatment from 1953. 34 males and 16 females received out-patient treatment.

16 cases (no deaths) received in-patient treatment; 19 cases were seen as out-patients during 1954. In the 1953 report all cases of smallpox were entered in this section, but to avoid confusion only general hospital cases are being returned herein for 1954. The majority of cases of smallpox are found on survey by the health authorities, and are discussed separately in the chapter on Public Health under the section Outbreaks of Epidemic Disease.

During 1954 308 cases (14 deaths) received in-patient treatment, and 2,179 cases received out-patient treatment. No suitable 1953 figures for comparison are available in respect of hospital returns only. The following were the centres where the largest numbers of cases were treated :—

Oda	157
Dunkwa	116
Gold Coast Hospital, Accra	83
Sunyani	72

Measles is not a notifiable disease, and little, consequently, is known of its incidence or its sequelae. It is normally treated in the out-patient departments of Gold Coast hospitals.

(xvii) YELLOW FEVER

One fatal case of Yellow Fever was diagnosed in Tamale hospital in a female patient during 1954, and confirmed serologically. This case is discussed in the chapter on Public Health under the section Outbreaks of Epidemic Disease.

(xviii) INFECTIOUS HEPATITIS

During 1954 350 in-patient cases (26 deaths) and 318 out-patient cases were seen and treated. This compares with 230 in-patient cases (15 deaths) and 215 out-patient cases treated in 1953. The greatest number of cases occurred in Ashanti (156 cases) followed by the Western Region with 136 cases and the Northern Territories with 112 cases. The aetiology of this condition remains obscure; some work has been done during 1954 with a view to ascertaining the nature of the causal virus in the Gold Coast.

(xix) RABIES

During 1954 13 cases of Rabies were treated as in-patients with 11 deaths. The remaining 2 cases, at Kumasi, were removed from the General Hospital South Wing by their relatives on realizing that no cure was possible. Technically, therefore, the deaths of these two cases did not occur in hospital and do not therefore feature in the hospital mortality figures, but they would undoubtedly have died since this is a fatal disease for which no cure exists at present.

It is to be hoped that a vaccine may shortly become available which will hold out some hope of reducing the mortality from this condition.

In 1953 2 cases of Rabies only were reported, with 2 deaths.

(xx) MALARIA

The incidence of malaria diagnosed in Gold Coast Hospitals according to the type of infection is shown in Table XLV. In 1954 a total of 6,957 cases (266 deaths) received in-patient treatment, and 58,061 received out-patient treatment. Malaria remains a major cause of morbidity in the Gold Coast. A report by the Medical Officer of Health in charge of the Malaria investigation is contained in Chapter VIII. It will be observed from Table XLV that a considerable number of cases (559 in-patients, with 26 deaths, and 2,546 out-patient cases) were attributed to Benign Tertian Malaria. Despite these figures there is considerable doubt as to the existence of this type of Malaria in the Gold Coast at least in any degree. Nigerian authorities are quite definite as to its absence from that country, and there is no reason to believe that it could exist in the Gold Coast but not in Nigeria. This is a matter requiring further investigation.

(xxi) DISEASES OF THE RESPIRATORY SYSTEM

Table XLVI shows the incidence in 1954 of Lobar Pneumonia, Broncho-pneumonia, Primary atypical, Other and Unspecified Pneumonia, Acute Bronchitis, Chronic and unqualified Bronchitis, Empyema and lung abscess, Pleurisy and Pneumoconiosis and enumerates the deaths from these conditions. The greatest number of cases of Lobar Pneumonia were reported from the following centres: Prestea (160 cases), Koforidua (89 cases) Gold Coast Hospital, Accra (83 cases) Tamale Central Hospital (70 cases) and Bolgatanga Hospital (67 cases).

The greatest number of cases of Broncho-pneumonia were reported from the following centres:—St. Joseph's Hospital, Jirapa (251 cases), the Holy Family Hospital, Berekum (205 cases) Koforidua (101 cases), Basel Mission Hospital, Agogo (95 cases).

Acute and Chronic Bronchitis are a major cause of illness more particularly of out-patient attendance at hospitals.

A considerable number of cases of Pneumoconiosis (316 cases with 5 deaths) were reported during the year. The incidence of this condition would indicate a need for more detailed investigation.

(xxii) CHICKENPOX

During 1954 162 cases (no deaths) received in-patient treatment, and 731 cases received out-patient treatment. In 1953 169 cases (no deaths) received in-patient treatment and 460 cases received out-patient treatment at hospitals. The real incidence of this condition is not reflected in the figures; it is known to be very widespread, but cases only occasionally report to hospitals. It is not a notifiable disease in the Gold Coast.

(xxiii) YAWS

During 1954 47,995 cases were diagnosed at Gold Coast hospitals. Of these 148 (no deaths) received in-patient treatment, compared with 175 cases (3 deaths) receiving in-patient treatment in 1953; 8 cases remained under in-patient treatment from 1953. Table XLVII gives the Regional Distribution of Yaws cases seen at hospitals including children's hospitals in 1954 and Table XLVIII indicates the centres where the largest numbers of cases were treated. Including cases seen at children's hospitals, a total of 51,079 cases were treated during the year. Statistics provided by Medical Field Units are not included in the figures. A decline in numbers of cases coming to hospital for treatment may be an indication of the effectiveness of antibiotic substances which are now being widely used in the treatment of this condition.

(xxiv) TRYPANOSOMIASIS

Three hundred and twenty-three cases of Trypanosomiasis were diagnosed at hospitals during 1954. Of these, 131 received in-patient treatment and there were 16 deaths. This compares with 68 cases receiving in-patient treatment in 1953, with 7 deaths. One hundred and three cases in 1954 were diagnosed by demonstration of the trypanosomes, and 203 were diagnosed on cerebro-spinal fluid findings in the absence of demonstrable trypanosomes. Statistics of this disease provided by Medical Field Units are separately recorded. Two hundred and four cases were diagnosed in the Northern Territories in 1954 compared with 457 in 1953, and in Ashanti 73 cases were diagnosed as compared with 54 in 1953.

OTHER IMPORTANT DISEASES

(xxv) BLACKWATER FEVER

In 1954 47 cases (3 deaths) received in-patient treatment. This compares with 25 cases (5 deaths) in 1953 and 29 cases (9 deaths) in 1952. The incidence of cases receiving in-patient treatment during the past 5 years is shown below:—

	1950	1951	1952	1953	1954
Number of cases	32	31	29	25	47
Number of deaths	7	15	9	5	3

As a cause of morbidity and mortality, Blackwater Fever continues to be a relatively unimportant disease. The rise in the number of cases receiving treatment in 1954 is not considered significant.

(xxvi) SCHISTOSOMIASIS

In 1954 a total of 507 cases (7 deaths) of all types of Schistosomiasis received in-patient treatment, and 5,269 cases received out-patient treatment. In 1953 431 cases (4 deaths) received in-patient treatment and out-patients numbered 4,526.

Of the patients treated during 1954, 369 in-patient cases (7 deaths) and 3,317 out-patient cases were *S. haematobium* infections. Forty-six in-patient cases (no deaths) and 239 out-patient cases were *S. mansoni* infections, and the remaining 92 in-patient cases (no deaths) and 1,713 out-patient cases were classified as other Schistosomiasis. This large unqualified group is not a satisfactory recording, since the diagnosis must depend on the presence or absence of the ova of this parasite in either urine or stools, and was presumably discovered at the time of diagnosis but not recorded. These figures have not the significance that would have attached to them had a full diagnosis been available for each of the cases classified as "Other Schistosomiasis".

(xxvii) ONCHOCERCIASIS

During 1954 714 cases were diagnosed, of which 88 (1 death) received in-patient treatment and 626 were treated as out-patients. This compares with 66 cases (no deaths) receiving in-patient treatment and 408 receiving out-patient treatment in 1953. Of these cases, 689 occurred in the Northern Territories in 1954 as compared with 415 diagnosed in 1953. In the case of the Eastern and Western regions, enquiry into reported cases disclosed that the infections reported were amongst immigrants from the Northern Territories, and this was also thought likely to be the case in respect of infections reported from Accra and Ashanti. Only in the case of Togoland was it considered by medical officers that the 6 cases reported were of local origin. Of the total number of cases, 484 were males, 228 were females, and two cases remained under treatment from 1953. This same preponderance of males over females was noted in the Northern Territories where 467 males and 221 females came under treatment. Jirapa provided the largest number of cases (287) in the Northern Territories with Bolgatanga (127) next, followed by Lawra with 62 cases. This distribution follows the same pattern as in the 1953 report. The British Empire Society for the Blind's team of research workers continued their work during the year, the ophthalmologist moving into Nigeria for further research into the problem as presented in that country.

(xxviii) LOIASIS

Twelve cases of this infection were diagnosed during 1954 of which 6 received in-patient treatment. There were no deaths. The cases were reported from Agogo and Obuasi in Ashanti (3 each), Tarkwa in the Western region (4 cases) and 1 each from Yendi and Bolgatanga. Information was not available as to whether or not these were imported cases. The distribution of reporting centres,—2 of which are large mining communities and 1 adjacent to a mining community, the remaining 2 being important trading centres—suggests that the cases may well have been in non-natives of the Gold Coast.

(xxix) FILARIASIS BANCROFTI

During 1954 a total of 220 cases of this condition were reported, of which 42 cases (no deaths) were treated as in-patients. Of the cases reported from the Western province, 6 cases occurred amongst the European employees of a private trading company in a remote part of the region, 1 male being treated as an in-patient in the company's hospital; one female European case was also diagnosed. 18 cases also occurred amongst the African employees of the same company. This condition may be more common in the Gold Coast than is to be believed by an inspection of the hospital returns. Individuals do not treat elephantiasis as of any particular significance, but rather as a misfortune which they must tolerate, and tend not to report to hospitals until elephantiasis has reached a degree so marked as actively to limit their wage-earning capacity, or other activities.

(xxx) UNSPECIFIED FILARIASIS

171 cases, including 51 in-patients (1 death) were treated during the year, the diagnosis in each case being classified as "Other Filariasis". A more definite diagnosis was presumably arrived at when deciding on the proper treatment in these cases, but enquiries disclosed that a full diagnosis was not recorded in every case. It would be valuable to have known whether any of these cases were *Onchocerciasis*, *Loiasis* or *Filariasis Bancrofti* for the purpose of this report. No medical officer submitted particular comments on the incidence of filariasis in annual reports.

(xxxi) HOOKWORM

In 1954 920 cases (8 deaths) received in-patient treatment and 5,474 cases were treated as out-patients. These figures compared with 681 cases (13 deaths) treated as in-patients and 3,407 cases treated as out-patients in 1953. They represent cases in which Hookworm infestation is the leading condition to which symptoms are attributed. Probably the majority of the population harbour this intestinal parasite, but the production of symptoms depends on the degree of infestation, and upon the presence of other conditions adversely affecting the health of the individual. It is a disease resulting from low sanitary standards, and its incidence may be expected to decline as and when the standards of sanitation throughout the country improve.

(xxxii) TAPEWORM

Three hundred and fifty-one cases (1 death) received in-patient treatment and 636 received out-patient treatment during 1954. This compares with 197 cases (no deaths) receiving in-patient treatment, and 580 receiving out-patient treatment in 1953.

(xxxiii) ASCARIASIS

During 1954 742 in-patient cases (19 deaths) and 7,156 out-patients received treatment for this condition. This condition is a result of absent or defective sanitary standards and its incidence will fall as these standards improve. Ascariasis deaths may be the result of heavy infestations giving rise to intestinal obstruction, perforation or volvulus of the gut, and obstruction or rupture of the common bile duct or pancreatic duct.

(xxxiv) GUINEAWORM

Three hundred and seventy-three in-patient cases (no deaths) and 1,376 out-patients were treated during 1954. This compares with 369 in-patients and 323 out-patients treated in 1953. The Northern Territories provided the greatest number of cases (668), followed by the Western Region with 555 cases, and Ashanti with 311 cases.

(xxxv) RELAPSING FEVER

One confirmed in-patient case of louse-borne Relapsing Fever was diagnosed and treated in Bawku Hospital during 1954. Confirmation of the diagnosis resulted from the discovery of *spirochaeta recurrentis* in peripheral blood films. This was the only confirmed case reported during the year. Eight cases were reported from a station in Ashanti but confirmation of diagnosis was lacking.

(xxxvi) TRACHOMA

Fifty-two cases (no deaths) received in-patient treatment, and 367 cases received out-patient treatment during the year. Of these cases 253 were diagnosed in the Northern Territories. The sequelae of this condition are corneal damage due to pannus; ulceration; secondary infection, and blindness. Healing may produce excessive scar formation resulting in entropion and trichiasis; surgical intervention is commonly required at this stage. Trachoma is common in the Northern Territories, patients usually presenting themselves suffering from entropion.

(xxxvii) SCABIES

This is an extremely common condition which provides hospital out-patient departments with much work. 107 in-patient cases and 5,659 out-patient cases were seen and treated during 1954. Scabies is due to a low standard of personal hygiene and will diminish as educational standards are raised.

(xxxviii) MALIGNANT NEOPLASMS

During 1954, 1,264 in-patient cases were treated as suffering from malignant neoplasms; of these 1,230 were diagnosed during the year, 34 remaining in hospital from 1953. During 1953 707 in-patient cases with 35 deaths were treated. Out-patient cases diagnosed are not admitted for treatment either because facilities for treatment do not exist, as in many remote outstations, or because the patient or his relatives are reluctant to accept admission once the condition has been explained to them. The following table gives the number of cases treated as in-patients during the past five years:—

	1950	1951	1952	1953	1954
Number of cases	128	144	142	707	1,230
Number of deaths	102	17	14	35	71

The steady rise in numbers probably indicates a greater awareness of the incidence of malignant neoplasms amongst Africans; improved medical facilities prompt sufferers to seek treatment for conditions the fatal termination of which has in the past been accepted with resignation. There is no real evidence to suggest that the incidence of malignant neoplasms is increasing amongst the population.

Table XLIX classifies the incidence of malignant neoplasms diagnosed in in-patient cases for 1954 and compares it with the incidence for 1953. Malignant neoplasm of the cervix uteri (254 cases with 48 deaths) was the primary cause of morbidity, followed by malignant neoplasms of other and unspecified parts of the uterus (199 cases with 18 deaths), and malignant neoplasm of the skin (186 cases with 1 death). The large miscellaneous group "All other and unspecified sites" accounted for 177 cases with 18 deaths.

Malignant neoplasms of the uterus and cervix were the main cause of mortality (22 deaths) followed by malignant neoplasms of the stomach (14 deaths). The fact that the mortality is on the whole low when compared with the number of cases diagnosed may be due to the discharge from hospital of patients for whom no further treatment can be offered.

(xxxix) BENIGN AND UNSPECIFIED NEOPLASMS

One hundred and eighty-nine in-patient cases (1 death) and 224 out-patient cases were treated during 1954. In 1953 132 in-patient cases, (5 deaths) were treated. The incidence of these neoplasms should be considered in conjunction with the incidence of malignant neoplasms.

(xl) NON-TOXIC GOITRE

Forty-seven in-patient cases (no deaths) and 48 out-patient cases were treated during 1954; this compares with 30 in-patient cases (one death) and 128 out-patient cases treated in 1953. Ashanti continues to provide the largest number of cases of this condition (74 cases), with the Northern Territories next (42 cases).

(xli) THYROTOXICOSIS WITH OR WITHOUT GOITRE

Twenty-one cases (no deaths) received in-patient treatment during the year whilst 10 cases were seen as out-patients. Five were treated at the Gold Coast Hospital, Accra, whilst one European Woman received out-patient treatment at a private hospital in the Western Region. Thyrotoxicosis is not a common disease in the Gold Coast.

(xlii) DIABETES MELLITUS

In 1954 215 in-patients (8 deaths) and 171 out-patients received treatment for this condition, compared with 155 in-patients (6 deaths) and 190 out-patients in 1953. Of the total of 386 cases seen, 131 were in the Western Region and 105 were diagnosed in Accra.

(xliii) NUTRITIONAL DEFICIENCY DISEASES

Eighty-five cases of Beriberi (5 deaths), 292 cases of Pellagra (2 deaths), 280 cases of Scurvy (no deaths) and 1581 cases of unspecified deficiency states (40 deaths) were reported during 1954. Table L presents the incidence of each disease together with the deaths arising therefrom, in respect of cases receiving in-patient treatment in hospital. The Northern Territories returned the largest number of cases of Pellagra in 1954 (214 cases). There is little frank Beriberi seen in the country, but the Western Region returns a high incidence of Scurvy (222 cases). The term "Other Deficiency States" covers all stages of deficiency from very minor degrees of under-nourishment to the major condition of Kwashiorkor, in many instances it being found extremely difficult to put a specific diagnosis to the condition seen.

(xliv) THE ANAEMIAS

Table LI shows the sex distribution of anaemia cases and deaths in 1954 excluding those remaining under treatment from 1953. This year's figures continue to show the wide difference in incidence as between hypochromic and hyperchromic anaemias which was so marked a feature of the 1953 returns.

(xlv) ASTHMA

In 1954 a total of 1040 cases received treatment, made up of 303 in-patients (8 deaths) and 731 out-patients; 6 cases remained in hospital from 1953.

(xlv) NON-MENINGOCOCCAL MENINGITIS

One hundred and eleven in-patients (44 deaths) and 29 out-patients were diagnosed and received treatment during 1954. It is probable that some at least of the cases recorded as Meningococcal infections should be classified under this heading.

(xlvii) EPILEPSY

Three hundred and forty-eight patients received treatment during 1954, made up of 115 in-patients (9 deaths) and 233 out-patients. Six of the nine deaths occurred in persons who were inmates of the Mental Hospital, Accra.

(xlviii) HYPERTENSION

During 1954, 203 in-patients (31 deaths) were treated as in-patients suffering from Hypertension with heart disease, and there were 269 cases seen as out-patients. The majority of cases (170) were seen in Accra. These figures compare with 61 in-patients (24 deaths) and 196 out-patients returned for 1953. One hundred and thirty-eight in-patients (9 deaths) and 294 out-patients were seen in 1954 suffering from Hypertension without mention of heart disease; this compares with 123 in-patients (7 deaths) and 199 out-patients returned for 1953.

(xlix) APPENDICITIS

Three hundred and forty-one in-patients (10 deaths) received treatment in 1954 suffering from this condition. These figures compare with 306 in-patients (25 deaths) in 1953, and 167 in-patients (9 deaths) in 1952. In 1954, only 15 cases received in-patient treatment in the Northern Territories, the majority of cases being reported from the more sophisticated centres such as Cape Coast (59 cases, 2 deaths), Kumasi (58 cases with 4 deaths) and Accra (60 cases with 2 deaths).

(l) INTESTINAL OBSTRUCTION AND HERNIA

Two thousand, four hundred and twenty-three in-patients (90 deaths) were treated during 1954, as compared with 2,037 in-patients (94 deaths) in 1953. Hernia is an important cause of morbidity and mortality in Gold Coast Africans.

(ii) GASTRO-ENTERITIS AND COLITIS—AGES FOUR WEEKS TO TWO YEARS

During 1954, 490 in-patients (85 deaths) and 5,627 out-patients received treatment for this condition, which is a major cause of morbidity amongst young children, although modern methods of treatment have drastically lowered the mortality.

(iii) CIRRHOSIS OF THE LIVER

In 1954, 251 in-patients (76 deaths) were treated as compared with 184 in-patients (52 deaths) in 1953. Two hundred and twenty-five out-patients were seen in 1954. The incidence remains high, the greatest number of cases over the past three years being seen in the Northern Territories (134) and in Accra (100) respectively.

(iiii) CHRONIC ULCER

In 1954, 1,431 in-patients (4 deaths) received treatment for chronic ulcer, and 22,116 cases received out-patient treatment. In 1953, a total of 45,517 cases received treatment, the total for 1954 being 23,547. The Western Region presents the greatest number of cases (7,680) followed by the Eastern Region (5,894) and Ashanti (5,780). The decline in numbers may be due to the increasing numbers of rural dispensaries and dressing stations opened recently, more particularly in Ashanti and Togoland, and also to more accurate recording methods employed.

ACCIDENTS

(a) *Motor Vehicle Accidents*

During 1954, a total of 14,208 cases received treatment as a result of motor vehicle accidents, 2,867 cases (139 deaths) receiving in-patient treatment, and 11,341 persons being treated as out-patients. In 1953, 1,793 in-patients (153 deaths) were treated. The increase recorded during 1954 is 1,074 in-patient cases. This illustrates all too clearly the toll of the road. The majority of motor vehicle accidents were recorded from Ashanti, where 1,093 in-patients (48 deaths) and 5,737 out-patients were treated during 1954.

(b) *Other Transport Accidents*

One thousand, one hundred and seventy-one in-patient cases (35 deaths) and 3,981 out-patients were treated for injuries arising from other transport accidents during 1954. The majority of cases (in and out-patients combined) were recorded from the Western Region (1,902 cases with 5 deaths) and Ashanti (1,790 cases with 8 deaths).

(c) *Accidents due to Suicide and Self-Inflicted Injury*

One hundred and forty-five cases (17 deaths) received in-patient treatment and 645 cases received out-patient treatment as a result of self-inflicted injury in 1954.

(d) *Accidents due to Homicide and Deliberate Injury to Others*

During 1954, 826 cases (8 deaths) received in-patient treatment and 3,834 cases received out-patient treatment as a result of deliberate injury by other persons. Of the in-patient cases, 499 were reported from Ashanti, 480 being reported from Kumasi. Of the out-patient cases, 1,856 were reported from Ashanti, 802 being from Kumasi and 963 from Bekwai. None of the cases reported from Ashanti in 1954 resulted in death to any of the injured.

(e) *All Other Accidental Causes*

During 1954, a total of 41,470 cases were treated for injuries arising from causes other than those listed under headings (a) to (d) above. Of these 4,871 cases (146 deaths) received in-patient treatment, and 36,600 cases received out-patient treatment.

(f) *Total Accidental Causes*

The total number of cases treated from all accidental causes in 1954 was 66,281, of which 9,880 (345 deaths) received in-patient treatment and 56,401 were treated as out-patients. In 1953, the numbers reported were 7,971 in-patient cases with 342 deaths.

CHAPTER III

GENERAL HOSPITAL SERVICES

The tables containing statistical data referred to in this chapter will be found in appendix "C".

(i) WORK DONE IN HOSPITALS

Table LII gives an indication of the demands made on the Hospital Services of the Ministry of Health during 1954, as regards in-patients and out-patients.

The greatest number of in-patients (8,678 cases) were treated in the Kumasi General Hospital South Wing. The figure compares with 9,421 cases treated during 1953, the decline in numbers being due to demolition of parts of the hospital, including ward blocks, the sites of which were required for the construction of the new Central Hospital and Nurses Training School. The Gold Coast Hospital, Accra, treated 5,544 in-patients, an increase of 470 cases over 1953, but still 566 less than in 1952. Apart from these two hospitals, the 10 busiest Government hospitals in the Gold Coast in respect of in-patients treated were in order Sekondi (3,776) Tamale Central (2,947) Keta (2,522) Tarkwa (2,371) Koforidua (2,167) Oda (2,143) Dunkwa (2,004) Bolgatanga (1,763) Winneba (1,569) and Sunyani (1,557). Of the non-Government hospitals which submitted returns, the busiest, in respect of in-patients, was Agogo (2,271) followed by Konongo (1,652), Jirapa (1,606), and Berekum (1,596).

In respect of out-patients, record-keeping methods in Government hospitals are unsatisfactory, and a large margin of error must be accepted in available statistics. The Gold Coast Hospital treated 50,393 new out-patient cases, followed by Kumasi General Hospital South Wing (46,597), Sekondi (32,469), Tamale Central (15,650), Koforidua (15,159), Akuse (14,378), Oda (12,391), Nsawam (12,272), Keta (12,160), Saltpond (11,691), Tarkwa (11,592), Cape Coast (11,201), Yendi (10,901), Kibi (10,378) and Dunkwa (10,045).

It is noteworthy that in the Northern Territories, only the Tamale Central and Yendi hospitals appear within the first 15 hospitals seeing over 10,000 new out-patient cases each year. The hospital services in the Northern Territories are still in the process of building up, and people tend not to come to hospital unless they are seriously ill.

(ii) ATTENDANCE OF CHILDREN AT HOSPITALS

Table LIII shows the in-patient treatment and new out-patient attendances of children under 16 years of age at a number of government hospitals, by regions and indicates the percentage of in-patients and new out-patient attendance by such children.

These percentages are of some importance as giving an indication of sickness amongst children and young persons under the age of puberty. It will be observed that the Northern Territories showed the highest percentage of in-patient treatment (39.05%) followed by Trans-Volta/Togoland (26.31%), Accra (20.06%) and the Eastern Region (17.06%). Accra features third due to the facilities for the care of children and infants available in specialised hospitals, the establishment of a health visiting service, and to the large number of schools in and around the town, as well as the fact that as a medical centre of long standing, the use of medical facilities is well understood by the people of the region. The over-all figure for the Gold Coast is 18.91 per cent.

As regards new out-patient attendances of children, the Northern Territories showed the highest percentage with 44.09 per cent, followed by Trans-Volta/Togoland (32.22%), the Western Region (21.24%) and Ashanti (20.00%).

(iii) UTILISATION OF HOSPITAL BEDS

Table LIV sets out for each region the disposition of available beds in Government hospitals in 1954 and compares it with 1953. The population figures quoted are the estimated mid-1954 populations as computed by the Government Statistician. Table LV similarly sets out the beds available to higher social grades in the Gold Coast. The ratio of beds in Government hospitals to population at mid 1954 was as follows:

Gold Coast	..	..	..	..	..	..	..	1 bed to 2018.7 persons
Accra Region	..	..	..	..	..	..	..	1 bed to 477.6 persons
Eastern Region	..	..	..	..	..	..	..	1 bed to 2791.5 persons
Western Region	..	..	..	..	..	..	..	1 bed to 1701.0 persons
Trans-Volta/Togoland	..	..	..	..	..	..	..	1 bed to 3557.2 persons
Ashanti	..	..	..	..	..	..	..	1 bed to 3423.6 persons
Northern Territories	..	..	..	..	..	..	..	1 bed to 2476.6 persons

These figures differ markedly from those given in the 1953 report; the latter were based on the 1948 census population, whereas those for 1954 were based on an estimate of population obtained by accurate statistical methods, and may therefore be regarded as reasonably correct, although the population so estimated takes no account of migration over the borders of the country.

The decline in the number of available beds in Ashanti was due to the partial demolition of the Kumasi General Hospital. This is the last report which will take the General Hospital into account, since it is expected that the new Central Hospital will open early in 1955, when the old premises will be totally demolished. Despite this temporary loss of beds in Ashanti, there was an over-all increase in available beds (including cots) of 85 during 1954.

(iv) NEW HOSPITALS UNDER CONSTRUCTION IN 1954

Accra Region

The first phase of the Tema Hospital was completed and buildings equipped during 1954. It was handed over to the Tema Harbour contractors who will administer it until the harbour construction is completed.

Eastern Region

Work continued during 1954 on the construction of the new Kwahu Hospital at Atibie near Mpraeso. This hospital, when completed will be equipped by Government and run as a joint enterprise on behalf of Government by the Seventh Day Adventist Mission.

Ashanti Region

(i) *The Kumasi Central Hospital*.—The first phase in the construction of this hospital was completed by the end of the year, the Administration and out-patient Blocks, the first two ward blocks, the X-Ray unit, Maternity unit, Kitchen, Laundry and ancillary buildings being handed over to the Ministry of Health. All necessary equipment for this phase had been received and the various units were, at the end of the year, under preparation for the reception of patients early in 1955. Work on the completion of the two remaining ward blocks and ancillary buildings including the power house continued. The Nurses Training School teaching block remained under construction.

(ii) *The Mampong Maternity Hospital*.—Construction of this joint Government-Mission hospital continued during 1954. The hospital will be built and equipped by Government, but run by the Anglican Church Mission.

(iii) *The Mental Hospital, Kumasi*.—Preliminary talks were held and plans for this project were examined during 1954. The hospital is to be built during the second development period.

Northern Territories Region

The new Bawku hospital was completed and occupied during 1954. The new Navrongo and Wa hospitals were completed and ready for occupation by the end of the year. The Jirapa hospital was approaching completion and at Yendi the out-patient, administration, and Maternity blocks, and a children's ward were completed.

(v) EXTENSIONS AND ALTERATIONS TO EXISTING HOSPITALS

Accra Region

(i) *The Korle Bu Hospitals*.—Work commenced during 1954 on the planning and design of the large scale additions and alterations to the Gold Coast Hospital which are intended to modernise the existing institution and bring the bed total up to 440. A Thoracic unit is amongst the additions to be made to the hospital. Other planned additions include the reconstruction of the out-patient dispensary on a larger scale, the construction of new X-Ray and Physiotherapy departments and a Pathology laboratory, and the centralisation of the main services of the Korle Bu Hospitals.

The planning of the Gold Coast hospital envisages the reconstruction of the Maternity Hospital, the construction of a paying block and of a children's unit so that the hospitals at Korle Bu will form a self-contained major medical centre. The paying block and children's unit will replace the Ridge and Princess Marie Louise Hospitals.

(ii) *The Mental Hospital*.—Essential extensions to this hospital were made during 1954, to cope with the increasing number of patients admitted.

Western Region

The structure of a new out-patients department at Sekondi hospital was completed, and at Axim a new laundry, out-patients waiting room, and extensions to the Maternity ward were completed during 1954.

Trans-Volta/Togoland

An X-Ray department was constructed at the Keta Hospital and by the end of the year was ready for the installation of equipment to be commenced. Plans were prepared for the construction of a hospital at Worawora to be managed by the Evangelical Presbyterian Church.

Ashanti Region

The Regional Medical Store in Kumasi was completed and was in partial use by the end of the year. A maternity unit, and a kitchen and laundry were constructed at Sunyani hospital during the year. Preliminary work was carried out on the site at the new Leprosarium at Kokofu near Lake Bosumtwi.

Northern Territories Region

At Tamale, extensions to the operating theatre at the Central Hospital were completed, and plans prepared for the construction of a maternity unit at the Tamale West Hospital. At Bolgatanga a lecture room for nurses was under construction at the end of 1954.

CHAPTER IV

SPECIALISED UNITS IN THE HOSPITAL SERVICES

(i) THE MEDICAL UNIT, GOLD COAST HOSPITAL

The unit operated under the supervision and control of the Physician Specialist. It contained during 1954 50 male beds, 24 female beds, 25 children's and infant beds, 10 isolation beds, and 4 side ward beds, total-ling 113. The total admissions during the year were 2,017 patients. The average period of in-patient treatment of each patient was three weeks, which reflected the prolonged treatment of a large number of cases of Typhoid Fever, Diabetes Mellitus, and Heart Failure. The aim of the Unit was to ensure the highest possible standard of medical care of cases admitted, and to introduce newly arrived medical officers to tropical medicine as met with in the Gold Coast. With these objects in view, regular ward rounds were carried out attended, as far as possible, by all medical officers on the Unit. Apart from direct admission to its beds, the Unit also accepted medical cases and gave advice on cases referred from Surgical and other units, and from the Princess Marie Louise Hospital for children.

(a) *Pneumococcal Meningitis.*

During the year, special efforts were directed towards reducing the mortality from pneumococcal meningitis, and a scheme of treatment was drawn up and put into effect with some success; 500,000 units of crystalline penicillin were administered by intramuscular injection four hourly day and night, and 20,000 units were administered intrathecally daily. Sulphadiazine in full dosage was given by mouth. The treatment continued for a period of about seven days, but the thecal punctures were relaxed when the cerebro-spinal fluid became clear.

Where lumbar puncture was difficult or its repetition was not feasible or desirable, an alternative massive penicillin treatment was used, 1,000,000 units being administered intramuscularly, preceded by 20,000 units of penicillin intrathecally, once only. This alternative method was not used on a sufficient number of occasions to justify the drawing of conclusions as to its efficiency.

(b) *Tetanus.*

This condition in the Gold Coast although the mortality and severity are less than in the United Kingdom, has an overall mortality rate of 50 per cent, and special efforts were made during 1954 to try and lower this in cases seen at the Gold Coast Hospital. The main factor determining prognosis in this disease is, of course, the length of the incubation period; the mortality varies inversely with this. In a general hospital where a large number of cases of Tetanus are seen, there are advantages in using a standardised scheme of treatment which prevents haphazard treatment and avoids delays. The scheme in use in the Gold Coast Hospital during 1954 was:—

- Adult.*—(1) Intravenous therapeutic antitoxin, 100,000 units injected slowly; adrenalin, 8 minims to $\frac{1}{2}$ cc as necessary.
- (2) Paraldehyde, 7.5 cc intramuscularly as needed. This was not given as routine more frequently than four hourly, depending on the number of fits; in bad cases it was used more frequently—sometimes two hourly, but in reduced doses and under the immediate care of a doctor. Paraldehyde is the most effective and the safest method of controlling the spasms.
- (3) If there was any wound, an injection of 1 cc procaine Penicillin twice daily for 5–10 days was administered, depending upon the extent of injury. The wound itself was dressed daily with hydrogen peroxide.
- (4) Intramuscular antitoxin, 100,000 units, was administered every fifth day.

Children.—Treatment was along the same lines, except that intramuscular paraldehyde was given in 5 cc doses not more frequently than six hourly and intramuscular antitoxin, 50,000 units, was administered every fifth day.

It is not possible at this stage to say whether the standard treatment has lowered the mortality, but its value in controlling spasms was established and proved superior to any previous method employed.

(c) *Diabetes Mellitus.*

It was found necessary during 1954 to establish a diabetic clinic to cope with the large number of diabetic patients who attend the hospital. This clinic operated once a week and acted as a follow-up for discharged cases, and also aided the selection of suitable cases for admission.

(ii) THE SURGICAL UNIT, GOLD COAST HOSPITAL

The unit operated under the supervision and control of a Surgical Specialist. The total number of operations carried out during 1954 was 2,877, the proportions of males to females being 3.1.

The most interesting case seen during the year was the finding in an outwardly normal male of 18 years of age, of the persistence and development of the Mullerian ducts at operation for a left inguinal hernia; a uterus with fallopian tubes was demonstrated, the two testes being in the normal situation of the ovaries.

More cases of carcinoma of the stomach were seen and operated on than in previous years. A number were found at laparotomy to be inoperable due to metastasis and direct infiltration. This increase in cases did not necessarily indicate an increase in the condition, but rather that the public was becoming more hospital minded.

(iii) THE SURGICAL UNIT, KUMASI GENERAL HOSPITAL

The unit operated under the supervision and control of a Surgical Specialist. Out-patients referred to this unit were seen at one of three clinics, each held weekly; namely, a General Surgical, an Orthopaedic, and a Gynaecological clinic.

Operative procedures in the main theatre numbered 3,040, an average of 9.7 per day (excluding Sundays when emergencies only are dealt with). Operations performed in other theatres are not included in the figure. The total number of surgical operations performed in the hospital was never less than 200 a month, and in August numbered 344.

The Surgical Specialist commented in his report:—

- (a) *Cases of Appendicitis* were more frequently encountered during 1954 than previously, Appendicectomies numbering 57.
- (b) *Complications of Gonorrhoea* are becoming less frequent as a result of the free and early use of antibiotics, most of the cases seen being in the older age groups: scrotal sinuses were much less often seen.
- (c) *Empyema* had almost ceased, only one case being seen in Kumasi.
- (d) *Peritonitis* without further classification of diagnosis had been diagnosed on 11 occasions. The evidence at operation was that in most cases the source of peritoneal infection was a vermiform appendix, and in others was secondary to gut perforation due to *Ascaris* Worms. Ascariasis was surgically a serious condition, and the impression has been gained that many cases of intestinal obstruction by bands were due to a bowel leak secondary to small perforations of the bowel by ascaris worms.
- (e) *Thoracoplasty*.—Three were done during 1954 on cases referred from Accra by the Tuberculosis Specialist. The use of Bethune's rib shears made this operation much easier.

New techniques adopted during the year and found valuable.

The Surgical Specialist employed, amongst others the following techniques during the year:—

- (a) *Angiomata*.—Injection of 20 per cent hypertonic saline into the deep layers of these skin tumours had been successfully employed instead of excision which is very disfiguring especially in the case of facial tumours.
- (b) *Cystoscopy under Pethidine Intra-venous Analgesia*.—This Scandinavian Technique has been found very valuable, and permits cystoscopy in the male as an out-patient.
- (c) *Intra-Aortic Catheterisation*.—This has been used in Uraemia, hypertonic solutions of glucose being introduced direct into the Aorta through a cardiac catheter which in turn is introduced into the brachial artery at the cubital fossa through the lumen of a serum needle. The finest gauge polythene tubing was used as the catheter. A marked diuresis is produced.
- (d) *Trans-urethral Prostatic Resection*.—In suitable cases, this method of resection has been employed using MacCarthy's prostatic electrotome. Cases so treated have made satisfactory progress without resort to open operative methods, and there have been no fatalities.

Malignant Neoplasms.—The Surgical Specialist reported that he was seeing an increasing number of these conditions, but was unable to give an opinion as to whether this was a true increase or due to an increasing public use of the hospital services.

(iv) THE OPHTHALMIC UNIT, GOLD COAST HOSPITAL

This unit operated under the supervision and control of the Ophthalmic Specialist. A total of 3,365 new out-patients and 12,243 out-patient re-attendances received treatment in 1954, 182 males and 63 females receiving in-patient treatment. The daily average of in-patient ophthalmic beds occupied was: males 3, female 1. 134 major operations and 947 minor operations were performed during 1954.

The Ophthalmic Specialist, in his report commented:—

- (a) *Eye Injuries*.—These were the commonest eye conditions seen, 423 cases reporting in 1954. Most of them were very trivial, "black eye" being very common.
- (b) *Asthenopia*.—This condition was the second commonest complaint seen in the Ophthalmic Clinic; 276 cases were diagnosed in 1954, implying that at least one patient in twelve was a neurotic in whom objective signs of ocular abnormality failed to account for his symptoms. The condition appeared to be a well defined anxiety state which affected a large proportion of the student population.
- (c) *Trachoma*.—106 new cases were recorded in 1954, being severe or acute cases. This figure was very low and probably gave no true indication of the real incidence.
- (d) *Phlyctenular Disease*.—73 cases were recorded in 1954, almost all being in children. This incidence was presumably a reflection of the high prevalence of Tuberculosis in Accra. The patients on the whole responded well to treatment.
- (e) *Onchocerciasis*.—51 cases were discovered, the principal source being the labourers employed by the Medical Officer of Health, Accra. They were treated with Suramin and Banocide and responded well, despite some alarming reactions with Banocide.

(v) THE OPHTHALMIC UNIT, KUMASI CENTRAL HOSPITAL

This unit operated under the supervision of a Medical Officer who, though not of Specialist Status, was specifically employed on ophthalmological duties. A total of 3,311 new out-patients were seen in 1954, 45 males, 13 females and 11 children receiving in-patient treatment. 68 major and 211 minor operations

were performed; of these, 115 cases were for removal of foreign bodies, there being 92 corneal, 23 conjunctival, and 3 intra-ocular cases respectively. 32 excisions of eye were carried out, and 20 cases were operated on for cataract.

Blindness.—186 cases were seen of whom 45 were due to senile cataract, 46 to glaucoma, 27 to optic nerve atrophy, 37 to keratitis, leucoma, and iritis; the remaining 31 were due to various causes including congenital cataract, retinitis, tumours, etc.

In the course of his Report, the Ophthalmic Surgeon stated that he had seen a considerable number of eyes over the years which had been operated on for cataract by unqualified practitioners outside the Gold Coast (Lome, Kano, Wagadugu, Abidjan). He had seen a number of cases in which operation by corneal incision had been done by migratory Hausa and Fulani practitioners, presumably carrying out a technique inherited from the traditions of the ancient medical centre at Timbuktu set up in the period of Arabic domination; post operative care and treatment of cases were neither known to nor understood by these unqualified practitioners with the result that many cases developed infection and the eye was lost. Those who recovered were not necessarily blind, but unable to see for lack of a correcting lens, and eventually came to established eye clinics such as the Kumasi Clinic.

(vi) THE EAR, NOSE AND THROAT UNIT, GOLD COAST HOSPITAL

This unit commenced work in April, 1954 after the arrival of the newly appointed Ear, Nose and Throat Specialist. By the end of the year 884 new out-patients had been seen and treated, and 110 operations performed. In the course of his Report, the Specialist commented as follows:—

- (a) *Tonsil and Adenoid Enlargement.*—This was relatively uncommon in the Gold Coast.
- (b) *External and Middle Ear Disease.*—This was common and of about equal incidence, but rarely seemed to lead on to mastoiditis. Mastoid operations, both cortical and radical, have been rare, two only of each being performed.
- (c) *Sinusitis.*—This was common and severe, particularly maxillary sinusitis; chronic cases required major operative surgery to produce relief, and few cases responded to out-patient treatment.

(vii) THE SPECIALIST ANAESTHETIST, GOLD COAST HOSPITAL

The number of general anaesthetics administered during 1954 by the Specialist was 2,972, 1,778 of these being at the Gold Coast Hospital and 1,069 at the Maternity Hospital, the Ridge Hospital accounting for 125. 416 regional anaesthetics were administered at the Gold Coast Hospital, and 1 at the Maternity Hospital. Apart from these cases, there were approximately 100 anaesthetics carried out not in operating theatres but in wards, the X-Ray Department, and the Out-patient Department.

In his report, the Specialist commented that with the exception of Ear, Nose and Throat operations, not many of the operative procedures performed in Accra demanded specialised anaesthetic techniques. The very poor general condition of many of the general surgical cases, however, required the use of specialised techniques in order that operation could be undertaken at all. This was particularly noticeable in cases of ruptured ectopic gestation and intestinal obstruction. Modern anaesthesia materially contributed to the survival of such patients.

During 1954, the specialist paid several visits to Sekondi and Kumasi to assist the surgeons in performing complicated surgical operations requiring specialised knowledge of anaesthesia. These visits were also useful in the examination and checking of anaesthetic equipment in the hospitals and Central Medical Stores.

An important duty of the Specialist Anaesthetist during 1954 was the training of Nurse Anaesthetists. Whilst the training has greatly improved in quality and intensity, the output has however been in inverse proportion.

(viii) THE X-RAY SERVICES

(a) General

During 1954, there was an increase of over 50 per cent in the number of cases examined resulting in part from the demands of the Tuberculosis and Orthopaedic services, but more particularly as a reflection of the general increase in hospital attendances.

Apart from the main centre at the Gold Coast Hospital Accra, there are nine stations in operation, viz.: at Kumasi, Sekondi, Takoradi, Cape Coast, Winneba, Tarkwa, Tamale, Dunkwa and Bolgatanga. No new stations were opened during 1954, but work proceeded at Ho and Keta and it was expected that a new station would be opened at the latter early in 1955.

The Staff consisted of:—

- 1 Radiologist Specialist
- 1 Superintendent Radiographer
- 2 Senior Radiographers
- 1 Chief X-Ray Maintenance Technician
- 14 Pupil X-Ray Assistants.

Two female Radiographers joined the staff, one on a temporary basis, while the Superintendent Radiographer proceeded on leave in June prior to retirement, and one X-Ray Assistant resigned. Of the five scholars in the United Kingdom pursuing studies in Radiography, one qualified in 1954 and returned to the Gold Coast.

The training of a class of pupils which commenced in August 1953 was continued during 1954.

In spite of advertisement in the leading Medical Journals of the United Kingdom since 1951, it had not been possible to attract Radiologists to this Country. At least two more were required. The new Kumasi Hospital merited one such officer.

The position respecting equipment was generally satisfactory. The new Watson unit installed at the Gold Coast Hospital in 1953, continued to function well and the Marconi set (also installed late in 1953) which was out of operation most of 1954 had been repaired and had had new parts supplied by the makers. New equipment was installed at Sekondi and Kumasi in keeping with the principle of gradual replacement of all obsolescent types. Installation and maintenance were satisfactorily effected under the supervision of the Chief X-Ray Maintenance Technician.

Late in 1954, consequent upon persistent low white blood counts in members of the junior staff, it was considered imperative to take measures for the greater protection of the staff generally and of those affected in particular. Shorter hours of duty were, therefore, introduced on the 6th December, 1954, to conform with the International Recommendations for the protection of X-Ray and Radium workers.

Supplies of X-Ray films were adequate, and shipment of fresh supplies at the prescribed intervals was regular.

A summary of the Radiographic work done in the various X-Ray Departments is shown below.

ANNUAL REPORT OF X-RAY SERVICE FOR 1954

RADIOGRAPHY

	Gold Coast Hospital	Sekondi	Kumasi	Tarkwa	Cape Coast	Takoradi	Winneba	Tamale	Dunkwa	Bolgatanga	Total
Chest	5,876	1,104	1,225	351	514	197	99	159	63	263	9,851
Barium Meals	205	52	52	8	7	31	—	7	6	13	381
Barium Enema	37	15	16	—	3	4	—	2	—	8	85
Urinary Tract	50	10	29	—	3	14	—	11	—	3	120
Gall Bladder	35	10	28	2	1	18	1	3	—	—	98
Abdomen (Pregnancy, etc.)	198	22	23	17	22	7	4	25	7	11	341
Location of Sinuses	217	11	22	—	—	21	1	1	—	2	275
Salpingograms	7	43	—	—	41	—	—	49	—	—	140
Bronchograms	8	—	—	—	—	—	—	—	—	—	8
Dental	120	139	64	3	99	33	28	21	3	3	513
General (Fractures, etc.) ...	3,782	1,184	2,276	288	538	304	264	409	159	424	9,664
Totals	10,535	2,590	3,740	669	1,228	629	397	687	274	727	21,476

(b) Physiotherapy

The Physiotherapy section was still administered by the X-Ray department. During the year a qualified Physiotherapist arrived and commenced work in Accra, the work previously being carried out by a Grade II nurse. There is a qualified Physiotherapist at Kumasi.

The existing X-Ray Department had no room for continuing physiotherapy work which was transferred to a side ward in the Gold Coast Hospital and in space formerly used as a lecture room. Attention was being directed to providing at least two more physiotherapy assistants especially in view of the new Physiotherapy department to be constructed shortly, and for purposes of relief. A summary of work done under this head is shown overleaf.

Plans were submitted for new X-Ray and Physiotherapy Departments, which are scheduled for completion in 1956.

ANNUAL REPORT OF X-RAY SERVICE FOR 1954
PHYSIOTHERAPY

	Gold Coast Hospital		Ridge Hosp. Accra		Sekondi		Kumasi		Tarkwa		Cape Coast		Takoradi		Winneba		Tamale		Dunkwa		Bolgatanga	
	Cases	Attds.	Cases	Attds.	Cases	Attds.	Cases	Attds.	Cases	Attds.	Cases	Attds.	Cases	Attds.	Cases	Attds.	Cases	Attds.	Cases	Attds.	Cases	Attds.
Faradism ...	29	191	—	—	1	4	14	97	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Galvanism ...	8	61	—	—	—	—	7	7	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Radiant Heat ...	52	26	—	—	—	—	142	829	14	93	157	352	7	36	3	38	40	276	—	—	—	—
Infra Red ...	26	153	—	—	3	16	92	493	60	388	1	2	86	303	5	32	—	—	—	—	13	150
Ultra Violet ...	3	12	—	—	—	—	12	30	—	—	—	—	6	29	—	—	—	—	—	—	—	—
Diathermy ...	1	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ultra Short Wave ...	42	260	—	—	—	—	—	—	—	—	—	—	6	21	—	—	—	—	—	—	—	—
Massage and Movements ...	178	1,150	—	—	—	—	448	4,073	—	—	2	24	5	31	12	122	—	—	41	564	9	48
Totals	339	1,886	226	623	4	20	715	5,529	74	481	160	378	110	420	20	192	40	276	41	564	22	198

Attds. = Attendances

(ix) THE DENTAL SERVICE

During 1954, Dental Surgeons worked in Accra at the Gold Coast and Ridge Hospitals, in Kumasi Sekondi, and Tamale, and a mobile clinic was operated in the coastal region and Trans-Volta/Togoland.

At the Ridge Hospital, 808 patients were treated, made up of 242 women and 362 men. Three hundred and ninety-two fillings and 172 extractions were carried out. Two hundred and four children were treated, mostly for extractions. One child was treated for Stomatitis and Vincents Angina whilst another, aged 8 years, was treated for a dentigerous cyst in the canine region of the right maxilla. Amongst adult patients, gum disorders were not frequently seen and the few patients treated for Vincents Angina were mostly resident in the rural districts of Accra.

The Mobile Dental Clinic operated during 1954 in the Eastern Region and in Trans-Volta/Togoland. In the latter region, bad roads accounted for a considerable amount of damage to the clinic and apparatus. There was also, in the Eastern Region, a rather poor attendance due to the difficulty in giving adequate publicity in the vernacular to all those language groups in the area. Total attendances during the year were 839.

(x) THE HOSPITAL WELFARE SERVICE

The staff of this service consisted at the beginning of the year, of the Chief Hospital Welfare Officer and three Assistant Hospital Welfare Officers. Two more Assistant Hospital Welfare Officers were recruited in July, and underwent an initial three months training course at the School of Social Welfare, thereafter undergoing practical training at the Gold Coast and Mental Hospitals in Accra. During 1954, the Service continued to operate in Accra only.

(a) *Gold Coast Hospital*.—At the Gold Coast Hospital, 185 cases were dealt with in 1954, this number being half as many again as were dealt with in 1953. Approximately 120 of these cases were referred by the Tuberculosis and Ophthalmic Specialists and by the Orthopaedic Surgeon, who were obviously experienced in the proper use of Welfare services. The remaining cases were mainly referred by medical officers wishing to know if patients really could not afford to pay fees, or to remove patients whose relatives had failed to come for them on discharge.

During 1954, 327 visits were made by the staff of the Welfare Service to patients' relatives, and to various organisations and officials outside the hospital in connection with patients.

Liaison on Tuberculosis with the Health Visitors continued during 1954, the Hospital Welfare Department providing the Superintendent of Health Visitors in Accra with a weekly list of new Tuberculosis cases admitted to hospital, and with reports on newly discharged cases.

The Welfare Department has also continued to assist women in the Tuberculosis wards with handwork, and has provided a small library and magazine service for both men and women tuberculosis patients.

Liaison with the Red Cross has continued on a satisfactory basis and this organisation has provided transport in emergencies when able to do so and has continued to visit destitute patients. The Red Cross has also arranged for a drink of milk to be given to all patients attending the weekly Tuberculosis out-patient clinic. Such patients often come from long distances and the service has been much appreciated.

(b) *Mental Hospital*.—During the year, there was an increase in the number of patients discharged, 151 such patients being dealt with by the Hospital Welfare service. Twenty-one patients asked for help in claiming wages or gratuities due, or for help for their families. Eleven relatives either wrote or called to ask for help. In the case of 79 patients, contact was made with their families, employers or friends by letter or other means, and 78 visits were made in Accra itself. Twenty patients' histories were obtained for the Psychiatrist by the Welfare staff, and 343 newly certified patients were interviewed to try to obtain more information concerning identity in case of future discharge, or to see if they needed any help. The appointment and assumption of duty of the male Mental Superintendent was of great assistance to the welfare service.

The Assistant Welfare Officer at the hospital undertook the holding of a weekly Group Therapy meeting for selected women patients in the absence of a qualified Psychiatric Social worker, and the Gold Coast University Social Service group have made weekly visits to hold a drawing class in the Female ward which is continued by the Welfare Service when the University staff and students are on holiday. The Red Cross has also assisted in providing recreation for patients by arranging for bands to play and choirs to sing to patients. This has been much appreciated.

CHAPTER V

GENERAL PUBLIC HEALTH

(i) GENERAL COMMENTS

There were no major epidemics of infectious disease in the larger municipalities during the year, but a minor outbreak of smallpox in Accra occurred and there were a number of cases in the Mpraeso, Oda, and Nanumba districts. The original infected persons appear to have come from Accra. The increasing incidence of Typhoid and Paratyphoid gives cause for much anxiety. The increase in number of cases receiving in-patient treatment during 1954 was 31·8 per cent over the 1953 figures. The increase in the Accra Region alone amounted to over 100 per cent.

Financial stringency has continued to be felt in the Ministry of Health, the allocation of funds for annually recurrent expenditure in 1954 being further reduced to 2·47 per cent from 4·2 per cent of the total annually recurrent expenditure of the Government. The actual sum allocated was not reduced; indeed it was increased by £98,501 over the previous years expenditure, but the proportion has not been maintained. The allocations made between 1950 and 1954 are set out in Table LVI of Appendix "D". The proportion being allocated to the Ministry of Health is now less than at any time during the past 25 years. The result is that the Ministry finds itself seriously restricted in the matter of maintaining routine activities, and unable to deal adequately with the problems imposed by development in the activities of other Ministries and departments.

In their Annual Report for 1954, Medical Officers of Health have all without exception stressed the acute difficulty they are experiencing in maintaining any form of sanitary standards under the present financial restrictions imposed on their activities, let alone providing for improvements in general and environmental sanitation.

(ii) MOSQUITO CONTROL

No improvement has been observed in the standards of construction in the residential areas around the larger towns, or in the methods of drainage employed in such areas, nor have funds been available to remedy the defects particularly in the Accra region, mentioned in the 1953 report. In Accra, a firm of consulting engineers was employed to draw up plans for the improvement of drainage and the installation of a water carriage sewage system; their report, awaited at the end of the year, is expected to make recommendations for drainage of the area of the Accra Municipality and the urgent problem presented by the several hundreds of miles of earth drains therein.

Oiling of all pools and drains and grass-cutting is carried out as regularly as the supplies of labour and available funds permit. However, for lack of funds many anti-malarial drains have become choked with grass and have been abandoned, thus becoming suitable breeding sites for mosquitoes and also providing ample harbourage for these insects.

Routine house-to-house inspections during 1954 numbered 1,656,397 and in the course of these inspections, 8,356 cases of mosquito breeding were discovered. Such inspections covered the municipalities, main towns, and limited sections of the rural districts of the country. In 1953, house inspections numbered 1,835,580, and 5,711 cases of mosquito breeding were found. In 1954, the highest larval indices were found in the Northern Territories, at Bimbilla (3·71), Babile (1·95), Lawra (1·92) and Bolgatanga (1·78). Keta, in Trans-Volta/Togoland had a larval index of 1·07, and Nandom, in the Northern Territories was 1·04. Babile, Lawra, and Nandom are all in the North West of the Northern Territories. Bimbilla is in the Nanumba district. Control of breeding in these areas is difficult since the very bad water situation makes it necessary for householders to store water. Swedru in the Western Region had a rather high larval index (0·95). Accra Municipality had a larval index of 0·9 which is too high for an urban community, and indicates a high rate of domiciliary mosquito breeding.

During December, a memorandum containing proposals for the elimination and control of mosquitoes in Accra was submitted to the Cabinet. These proposals were based on the report of the Medical Officer of Health in charge of the Malaria Investigation, the intention being to reduce mosquito nuisance to a minimum by Independence Day. They envisaged a capital expenditure of £14,000 and an annual recurrent expenditure of £45,000. It was not found possible to approve the proposals contained in the memorandum, and a scheme was embarked on which involved enlisting the aid of the public, led by school children and the Boy Scout movement to deal with local health problems associated with mosquitoes.

(iii) GENERAL SANITATION

(a) Urban

At the end of 1954, the consulting Engineers employed by the Accra Municipal Council to advise on the construction of a water carriage sewage disposal system for Accra had not yet produced their report but it was understood to be likely to be published early in 1955. In respect of Kumasi, the Medical Officer of Health reported that the Town Engineer had asked for the sum of £215,000 in order to carry out the first stage of the construction of a water carriage sewage disposal system in that town. The new town of Tema which during the year under review was still in the planning stage, will be provided with water carriage sewage disposal.

The Medical Officer of Health, Kumasi, in his report for 1954 stated that the 165 public septic tank latrines in the Municipality were not functioning due to over-loading, and required emptying at frequent intervals. There were also 73 public pan latrines with 853 pans, and 4,216 private pan latrines. The trenching ground was in the town, and plans had been made for it to be moved outside the Municipality.

Similarly, the method of refuse disposal employed was crude dumping on a swampy site in the centre of the town. A site outside the municipality suitable for controlled tipping and incineration was in process of acquisition. Whilst the geographical position of Kumasi makes it easy for the drainage of storm water, the re-construction of many smaller drains to take the volume of water during heavy rains was an urgent necessity; similarly the provision of concrete relief drains in 8 valleys in Kumasi was an urgent requirement to prevent swamp formation and mosquito breeding. The suburban areas of Suame, Aboabo, Kwadaso, Old Tafo and Amakom now included within the Municipal boundaries, possessed no form of permanent drainage, a further urgent requirement.

In Accra, the development of the town and its suburbs has proceeded at a pace and in a manner which has rendered existing methods of sanitary control completely redundant. Town cleansing, which has not been efficient for some years, could not now cope with the task; mechanisation and modernisation must be carried out. The present cost of the environmental services in Accra was £202,811 per annum, of which £136,246 was spent on labour alone.

In Kumasi, the cost of the conservancy service alone was £84,075 per annum of which £38,802 was spent on labour. In Cape Coast, the cost was £12,539 per annum, the cost of labour being £7,232. In Tamale, Koforidua and Winneba including Swedru, the annual cost of the conservancy services was £10,109, £8,359 and £7,134 respectively. Modernisation of the conservancy service and its replacement whenever there is an adequate water supply by a water carriage system would greatly decrease the recurrent expenditure on a type of service the extension of which is undesirable as towns expand in size.

(b) Rural

There has been no change in the position described in the 1953 Report; local authorities are still neither ready nor equipped to assume full control of public health activities in their districts, and Government continues to maintain staff in many rural areas. In Ashanti, there appeared during 1954 to be some progress in rural public health. Government Health Inspectors were appointed to various centres to control, with the consent of local authorities, the activities of local authority health staff and to assist and advise local authorities on the spot. In this way, Ashanti was well covered by Government Health Staff during 1954, and the Medical Officer of Health, Ashanti, was kept in direct contact with the plans for improvement in sanitary services being developed at Local Council level.

All Medical Officers in the Northern Territories were unanimous in reporting that the main problem with which they had to deal was that of environmental sanitation. This has special significance in large areas of the Northern Territories, where no villages exist, but people inhabit large compound houses isolated one from the other by at least the distance of one arrow-shot. Defaecation and micturition into the surrounding land is the rule in such areas, and this has contributed towards maintaining soil fertility in heavily populated areas. The introduction of mixed farming should make it possible to consider the sanitary problems of these areas where such farming has been adopted.

Little information was made available during 1954 as to the general sanitary conditions in the rural areas of the Eastern, Western and Trans-Volta/Togoland Regions. The sanitary organisation in these regions during 1954 was not as well established as in Ashanti.

(iv) MEASURES AGAINST SMALLPOX

A total of 1,041,672 vaccinations were performed during 1954, of which 341,551 cases were seen again for inspection. Of these, 264,208 were successful, and 77,357 were unsuccessful. The results in 700,121 cases were unknown. These figures indicate that 22.6 per cent, or nearly one quarter of all vaccinations seen again for inspection were unsuccessful, and that of the total number of vaccinations carried out approximately 210,000 may have been failures. This is of the greatest importance in considering the value of routine vaccination. Included in the group are persons—numbers unknown—who have been previously vaccinated and are therefore protected against smallpox. It would seem that early vaccination of school and other children at clinics, combined with the maximum control of immigrants would provide the surest method of protection against smallpox.

(v) MEASURES AGAINST PLAGUE

Routine precautionary measures are taken to keep down the rat population. Rats are trapped and a selection of the animals are dissected post-mortem. Rats which are found dead are also submitted to dissection. During 1954, 106,962 rats were trapped, and 155 were found dead, making a total of 107,117 rats. Of these 1,733 were examined post-mortem, 1,467 such examinations being at Sekondi-Takoradi. A recent tendency has been noticed whereby the examination of rats has been allowed to lapse, nor does so much attention appear to be given to the need for watching the mortality amongst the rodent population. In many larger centres there are said to be no dead rats found. It is felt that the necessity for checking the presence of epizootic disease in the rodent population may not be fully appreciated.

(vi) MEASURES AGAINST RABIES

Routine precautionary measures include the seizure and impounding of stray dogs, and the destruction of all such dogs not reclaimed by their owners, or which, after detention, cannot be sold. Similarly, dogs which bite people and sick dogs are also impounded, and if they die within 10 days, the head is removed and sent to the laboratory for examination. During 1954, 1,351 dogs were caught, 430 being reclaimed by their owners and 921 destroyed. 41 dog brains were examined at the Medical Research Institute, and Negri bodies were found in 15 cases. Here again it would appear that the importance of the examination of dog brains is

not properly recognised; 36.6 per cent of all dog brains sent to the Laboratory were found to contain Negri bodies, yet only in 4.4 per cent of cases were the brains of dogs destroyed sent for examination. Since very active measures against dogs may be necessary if a serious outbreak of canine rabies occurs, failure to examine dog brains leaves a Health Officer without any definite indication of the disease from which dogs in his district are dying; dumb rabies in particular may mimic canine hysteria or trypanosomiasis, although rabies has a rapidly fatal termination. Failing any protective vaccine for both dogs and human beings against this disease, no precautions for its elimination amongst dogs should be relaxed.

(vii) PREVENTIBLE ILLNESS

During 1954 6,193 persons received in-patient hospital treatment for diseases due to the ingestion of contaminated food and drink; this compares with 5,369 persons in 1953. These cases represent hospital beds occupied by persons suffering from illnesses which were the direct result of faulty hygiene and sanitation.

(viii) HOUSING

There is no change for the better to report in 1954. The position remains as stated in the 1953 Report. So long as there is no Public Health Ordinance enabling the Minister to set standards and require such standards to be maintained, the position reported in 1953 is unlikely to be improved. In Accra multi-storeyed buildings are being erected without regard to the limitations imposed by sanitation; large store blocks some of which are six storeys high are being erected, the sewage and other wastes from which will have to be collected in cesspits on the sites.

(ix) FOOD IN RELATION TO HEALTH AND DISEASE

During 1954, a total of 2,238 cases of nutritional disease were treated in general hospitals in the Gold Coast. Of these, 571 received in-patient treatment for the following conditions:—

Beriberi	..	..	..	..	..	..	..	..	..	29 cases (5 deaths)
Pellagra	..	..	..	..	..	..	..	..	..	68 cases (2 deaths)
Scurvy	..	..	..	..	..	..	..	..	..	7 cases (No deaths)
Other Deficiency States	..	..	..	..	..	..	..	..	..	425 cases (40 deaths)

Kwashiorkor is amongst diseases listed under other deficiency states in 1954 and there was no method devised by which this condition could be differentiated statistically.

The main dietary deficiency in the Gold Coast is said by outstation medical officers to be protein. This assertion is based on knowledge of local food customs and observation of diets, rather than on scientific data, but is probably correct. In this respect, Table LVII of Appendix " D " is of interest: it gives details of the returns of animals slaughtered for food in known centres of population having either slaughter-houses or slaughter slabs, and where meat is inspected by sanitary officers serving either Government or local authorities. It will be noted that the Ashantis by far outstrip the rest of the country in the amount of cattle, sheep and goats slaughtered for food, whilst in Accra and Trans-Volta/Togoland a far greater amount of pig meat is eaten than elsewhere in the Gold Coast. These regional returns give only an indication of the true position, since Ashanti is comparatively well organised from a sanitary point of view whilst the rural parts of those regions comprising the old Colony Region are not completely covered by a Public Health Organisation.

All Medical Officers of Health have continued to express concern at the low standards of hygiene prevalent amongst food hawkers, restaurant and chop bar owners. Food in such places is often prepared and served under the very worst conditions; so long as there is no Public Health Ordinance empowering the Minister to set standards for such establishments, these premises will continue to be a menace to the health of those of the general public who use them.

(x) NUTRITION

The Nutritionist has continued her investigations during 1954 but a detailed report will not be available before next year. A Survey of school feeding in day schools in Accra revealed that a considerable number of children had very poor meals at school, and steps were taken to remedy this. An interesting discovery was that certain foodstuffs, notably peas, beans, groundnuts and ripe plantain are popularly believed to be unsafe for use by nursing mothers. Propaganda against this belief was carried out through the medium of Mass Education talks on nutrition.

(xi) SCHOOL HYGIENE

There was no new development to report in this sphere, and the position remained as stated in the 1953 report. Educational development proceeded apace during 1954, but there was neither the medical staff nor the facilities available for a school medical service to be developed along the proper lines. Sick children attended the general hospitals as out-patients. Since the special efforts in the direction of education now being made can only be of value to children who are healthy and fit to absorb information, the development of a school medical service must be regarded as of the first importance. The child who harbours a heavy infestation of hookworm, or who suffers sub-normal health due to chronic malaria or has any chronic illness is usually listless and mentally backward, and is not capable of absorbing knowledge and acquiring information; *mens sana in corpore sano* is a hackneyed Latin tag, but its message is extremely topical in the Gold Coast today.

(xii) PORT HEALTH

(a) *Seaports*

The main port for disembarkation of passengers arriving by sea in the Gold Coast is Takoradi, but the surf ports at Cape Coast, Winneba, Accra and Keta are also occasionally used for the embarkation and disembarkation of passengers who travel by Cargo boats. The extent of traffic to and from these ports during the last five years is revealed below:—

PORT	DECK PASSENGERS									
	1950		1951		1952		1953		1954	
	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals
Takoradi	8,394	4,323	6,173	6,354	6,625	5,886	4,484	5,159	5,596	5,554
Cape Coast	—	103	—	101	36	1	1	54	—	—
Winneba	—	1	—	—	—	20	—	96	9	26
Accra	4,326	1,032	3,295	332	2,161	603	2,084	378	1,859	795
Keta	—	—	—	—	3	—	5	—	8	—
TOTAL	12,720	5,459	9,468	6,787	8,825	6,510	6,574	5,687	7,472	6,375

The change in pattern of arrivals and departures at Takoradi noted in the 1953 report returned to the customary slight excess of departures over arrivals noted in 1951 and 1952.

It had been thought likely that Axim port might be reopened during 1954 but this did not occur. The preliminary work of constructing the moles at Tema for the new harbour commenced towards the end of the year.

(b) *Airports*

The Gold Coast has one designated International Airport at Accra. During November 1954 authority was given to one airline to use Takoradi as its first port of entry to and departure from the Gold Coast, although by the end of the year Takoradi had not been formally designated as an international airport. Airport traffic during 1954 and the previous four years is shown below:—

Accra	1950	1951	1952	1953	1954
Passengers departing	7,914	10,844	13,541	13,305	16,529
Passengers arriving	8,683	13,990	13,577	13,001	16,007
Passengers in transit	1,189	1,625	1,382	753	253
Number of planes disinsecticised	1,978	1,976	1,996	1,590	1,894

Takoradi	1953	1954
Passengers departing	—	32
Passengers arriving	—	28
Passengers in transit	—	Nil
Number of planes disinsecticised	—	9

(xiii) OUTBREAKS OF EPIDEMIC DISEASE

(a) *Yellow Fever*

Two suspected cases were reported during 1954 from hospitals in the Eastern and Western regions. One was serologically proven not to be Yellow Fever, whilst the other remained unconfirmed at the end of the year. One fatal case occurred at Nyankpala, 9 miles west of Tamale in the Northern Territories. This—a girl of 20 years of age with a history of fever for four days became jaundiced six days from the onset, and died in Tamale Hospital on the 7th day of illness. A viscerotomy specimen of liver was sent to Lagos where a diagnosis of Yellow Fever was confirmed. The patient's serum was also positive to the mouse protection test. The onset of this case was October 25th, and the patient died on November 1st.

No record is available of the larval index at Nyankpala, but it will be noted that the larval indices in other places in the Northern Territories were extremely high. No record of the aedes index is kept in any station in the Gold Coast. It is worth recording, however, that in Bimbilla, where the larval index was 3.71, an outbreak of "jaundice" occurred, but there was no evidence to suggest that this could have been Yellow Fever. The fact, however, that an isolated case can occur in the dry season in a village in the Northern Territories emphasizes only too clearly the need to be continually on the watch for this condition.

Yellow-Fever Surveys 1954

In October and November, Dr. Porterfield of the Virus Research Institute, Yaba, carried out a number of surveys in the Gold Coast and sera were collected in seven widely separated areas, as far as possible from life-long residents of villages, and sent to Yaba for examination in mouse protection tests. The results were as follows:—

1. *Old Tafo area.*—Thirty-one sera were collected from persons who had spent their entire lives in and around Tafo. Of these, four were protection test positives and two were doubtful. These numbers indicated a low rate of infection. There were no positives in persons under the age of 20 years.

2. *Apinamang, near Akwatia*.—This was visited because of a report that cases of jaundice are not uncommon in the Akwatia area. 42 sera were examined, and of these eight were protection test positives with one doubtful result in a child of nine. This indicated a lower rate of infection than was believed to be the case in Akwatia itself, and suggested that there had been no recent epidemic of yellow fever there.

3. *Pumpuano, Kintampo*.—During May and June 1954 an outbreak of fever associated with jaundice was seen in the Kintampo area by staff of Medical Field Units. 61 sera were collected in Pumpuano, well distributed over the age groups. 36 cases were protection test positives in the under 5 age group, 4 out of 10 in the 5-9 age group, with a steady increase in the number of positives in the older age groups. The results indicate that Yellow Fever is endemic in the district, and it was not improbable that the illness prevalent in May and June was Yellow Fever.

4. *Kpandae, near Yendi*.—Jaundice cases were reported from here in September. The town was visited in company with the Medical Officer, Yendi and further cases of jaundice were seen. The illness started with a sharp febrile attack followed in about 5 days by the onset of jaundice, often considerable; 41 sera were collected in roughly equivalent age groups from convalescents and healthy persons. The evidence from examination of these sera although not decisive, suggested that the outbreak of jaundice was not due to Yellow Fever.

5. *Tamale*.—96 sera examined from this area were in agreement with the known history of yellow fever in the district and results suggested that there had been no further introduction of the disease since 1931, the year of the last known outbreak in Tamale and Pong-Tamale.

6. *Pong-Tamale*.—39 sera were collected from this village and the evidence suggested again that no further yellow fever had occurred since the 1931 outbreak.

7. *Bolgatanga*.—No recorded case of yellow fever was known in this district. 63 sera were collected from Bongo and Yorogo, north of Bolgatanga. The results suggested that there had been an absence of yellow fever for about 25 years, which would again fit in with the supposition that there had been no major outbreak in the Northern Territories since 1931.

(b) *Cerebro-Spinal Meningitis*

The incidence of this condition continued to decline during 1954; 134 cases were notified as compared with 235 in 1953. Table LVIII of Appendix "D" shows the regional monthly notifications in 1954 and compares them with 1953. It will be observed that cases were reported right through the year, including the rainy season. In the absence of confirmation of the diagnosis by lumbar puncture, it is possible that some of the cases reported were non-meningococcal meningitis, particularly from the South, and during the rains. Table LIX of Appendix "D" gives the rainfall by months from a number of stations in the Northern Territories. January was universally a rainless month and in February less than an inch fell in any station. The previous December had also been practically a rainless month, Wa having the greatest rainfall with 0.29" recorded. The majority of cases in the Northern Territories occurred in February and March 1954, the monthly incidence dying away very rapidly thereafter. This coincided with the onset of the early rains, Navrongo and Yendi having over 2" rainfall in March. In Togoland the 19 cases discovered in the Hohoe district were located in March and in Bekwai, Ashanti, the majority of cases were discovered in April. Bekwai is in the rain forest south of Kumasi, and has a high humidity and rainfall. Table LX of Appendix "D" gives the distribution of cases, by districts, and Table LXI details the countrywide distribution of cases and deaths by age groups.

(c) *Smallpox*

79 cases (6 deaths) were notified during 1954 as compared with 282 in 1953 when there were 43 deaths. Table LXII shows the monthly notification received from regions, and Table LXIII shows the main infected centres during 1954. Table LXIV shows the monthly incidence of cases by political districts within regions.

During 1954 there has been no major outbreak of Smallpox, the towns of Accra and Kumasi reporting a limited number of cases each; of those reported from outstations, one case each in Bimbilla (Nanumba District), Nkwanta (Mpraeso District) and Asuboni (Oda District) were found to have come from Accra in June and July; 6 cases were discovered in Accra in June, one previous case having been found in Labadi in February. One case in Tamale was reported as having come from Yendi; no cases were reported from Yendi itself, and this case may also have come therefore from Accra via the Bimbilla-Yendi road. In May, one case was reported from Keta, which was travelling to the Gold Coast from Nigeria. A great difficulty in tracing an outbreak to its source in the Gold Coast is that Gold Coast people are great travellers, both inside and outside the territory. The majority of cases reported during the year were from villages and small rural centres.

(xiv) PRISONS

The daily average population for all Government prisons was 3,488.44 in 1954 as compared with 3,543.67 in 1953. There were 24 deaths, giving a death rate of 6.88 per 1,000 prisoners. For 1953 the death rate was 4.23 per 1,000 prisoners. The daily average on the Sick List was 33.63. All Government prisons continue to be very overcrowded, but preliminary work on the new Central Prison at Nsawam is proceeding and this, when ready to receive prisoners, will considerably alleviate the position.

Returns "A" in respect of the Accra Prisons, James Fort, and Ussher Fort and of the Maamobi Borstal Institute were not received for 1954, a different form of return being rendered, but it is of interest to note that Chronic ulcer was the principal cause of outpatient treatment (2,646 cases), followed by Malaria (2,184 cases), Gonorrhoea (1,879 cases) and infections of the skin and subcutaneous tissue (1,220 cases). In those prisons which rendered Return "A", the principal cause of inpatient treatment was other and unspecified malaria (46 cases), followed by Chronic ulcers (19 cases) and Intestinal obstruction and Hernia (10 cases, I

death). Women prisoners received in-patient treatment for Quartan Malaria (1 case) Malignant Tertian malaria (2 cases) Chickenpox (1 case) Nutritional Deficiency states (1 case) Vascular lesions affecting the central nervous system (1 case) Inflammatory diseases of eye (3 cases) Diseases of Breast (1 case) Abortion (1 case) and Uncomplicated delivery (1 case).

The total number of in-patients treated, excluding James and Ussher Fort Prisons and the Maamobi Borstal Institute, was 394, made up of 380 males and 14 females; the total number of out-patients treated in all prisons during 1954 was 17,929 made up of 15,883 males and 2,046 females.

Deaths in prisons during 1954 numbered 24, of which 8 were attributed to respiratory tuberculosis, 2 to misadventure, 2 to pneumonia, 1 to stabbing, 1 to drowning, 1 each to intracranial haemorrhage, acute dilatation of the heart, chronic lung abscess, haemorrhage due to mediastinal tumour, aortic aneurysm, congestive heart failure, septicaemia, anaemia, epilepsy, and chronic meningitis.

Patients suffering from infectious diseases were transferred to the prison camp at Ankafu for special treatment.

CHAPTER VI

MEDICAL FIELD UNITS

(i) INTRODUCTION

The technique of a field survey is still basically the same as in the days of the trypanosomiasis campaign. However, so many extra activities have been added on that a statement of the present technique is due.

The village to be surveyed is informed beforehand, and when the team arrives, on foot or by lorry, their first concern is to arrange their own accommodation. It is decided in advance how many people are to be examined each day; in the evening two members of the team go round telling the necessary number to attend at 6 a.m. the following morning, and at the same time writing and numbering their names in the survey book. The number to be dealt with is limited by the microscopists' daily capacity of 20 blood slides each.

At 6 a.m. the names written are called in turn. Each person is first seen by a selector, and examined for glands in the neck and overt evidence of disease. He also has a thick blood film taken, with his number written on the slide in blue and this is handed to him. If he has enlarged cervical glands, he is given a second slide numbered in green. If he is to be included in the sample survey for onchocerciasis, he is given a third slide numbered in red. If he has yaws, he gets a yaws treatment card.

At the next table he is vaccinated.

At the next table skin snip and gland puncture are done if needed, the specimens being mounted on the green or red numbered slides given to him by the selector, and his blue numbered slide is taken from him for staining.

Finally he has his dose of penicillin for yaws. He is then free, to go about his normal business. The last case of the day is seen at about 8 a.m. (In some areas, it has been found possible to include a sample survey for bilharzia.)

Whilst examinations, recording, and collection of specimens are continuing, gland juice and skin snip specimens are examined immediately they have been taken. Blood slides are put to stain slowly in Giemsa. When the last case of the morning has been seen, the team goes off to breakfast. Afterwards, examination of blood slides occupies the rest of the working day. The man in charge of the team, or the Medical Officer if present, teaches as clinical and microscopic material offer the chance.

Trypanosomiasis cases are referred to an ad hoc treatment team, the pace of whose progress is independent of that of the survey team.

In some areas where trypanosomiasis is rare or absent, examination of blood is made selective instead of universal. All the team's activities except the examination of blood films can be speeded up considerably so that progress is much more rapid.

Routine Field work still serves two distinguishable purposes. The first is the systematic mapping of endemic disease throughout the country, treating such conditions as can be dealt with in the field. The second, which has not lost its importance, is the search for trypanosomiasis. In many areas free from trypanosomiasis, it may turn out that a single survey by the Medical Field Units will suffice for many years. Subsequent operations in such an area may consist only of mopping up yaws, revaccination, and perhaps a specific campaign against a disease such as onchocerciasis. In trypanosomiasis areas, full resurvey is needed at fairly frequent intervals.

The general survey of endemic disease by the Medical Field Units, begun in 1951-52, has now covered over half of the Northern Territories, three-quarters of Ashanti and one-third of southern Togoland. Areas entered for the first time during 1954 included the Krachi district, Tongu in Togoland, Frafra in the Northern Territories, and south-east Ashanti.

The Frafra area is of considerable interest. It is the most densely populated area of the Northern Territories, and very little was known about it from the medical point of view until after the war. It contains no villages, its compounds being spaced out at bowshot intervals; it is organised into a number of highly parochial tribal chieftainships. In 1939 there was probably some cerebro-spinal meningitis there, but the revealed epidemic stopped abruptly when the Medical Officer of Navrongo did full autopsies on the first cases. In 1947-48 there was quite a severe epidemic of smallpox, followed by an outbreak of cerebro-spinal meningitis, and co-operation with the medical authorities was reluctant. Until the opening of Bolgatanga Hospital, the Frafra had to go a long way for medical attention. They are great travellers, and can be seen in numbers everywhere in the Gold Coast, but little has been known about them in their own country. At first, it was not easy to get them to understand the purpose of the survey. They have no trypanosomiasis and very little yaws, these being the two diseases which Medical Field Units treatment affects in the most spectacular way. However, with patience and tact that reflect the highest credit on the staff concerned, their confidence was won and the survey proceeded smoothly. The little yaws that occurs in the area may well be eliminated by the end of 1955.

The south-east of Ashanti is a very different area. It is served mainly by the Basel Mission Hospital at Agogo, and it is a wealthy cocoa and farming area, with fairly large towns. The Medical Field Units survey technique does not achieve its best results in towns, and some absenteeism must be expected. Nevertheless, the survey is revealing an important amount of trypanosomiasis. A disadvantage inevitable in wealthy areas is being encountered, in that quacks have already been caught giving injections with the claimed authority of the Medical Field Units. Bearing this in mind, work there may be difficult, but the existence of trypanosomiasis cannot be neglected.

In Togoland work has gone very well. Both the Krachi district and Tongu are rural areas which hitherto have had very little medical attention. A road system is only now being created, and parts of Tongu still depend mainly on the Volta for communication. A limited trypanosomiasis survey was done in the area about six years ago. Since then Medical Field Units have been repeatedly asked to return, and having returned have been welcomed.

In the old endemic areas of trypanosomiasis, the purpose of team visits is well known, and the addition of the penicillin treatment of yaws to our therapeutic armoury has been very popular.

The Mirigu survey ended on March 31, though by previous agreement the dispensary is still staffed by Medical Field Units. At Mirigu and the fixed centres, and at Wa, Lawra and Yendi hospitals, Medical Field Units staff are responsible also for the treatment of leprosy and in some instances yaws.

A fixed centre was opened at Tumu during 1954. The main reason for this was local demand for a centre where antrypol treatment of onchocerciasis could be permanently available, but the treatment of leprosy is also given, it being the first time that treatment of this disease has been available in the Tumu district.

At Kumasi the buildings of the new fixed centre have been completed. This is a great advance. More cases of Trypanosomiasis are treated at Kumasi than at any other centre, and since it opened in 1945 it has been operating in a room of a private house at Abrepo. Not only the accommodation, but also the locality was unsuitable, as Abrepo is in a tsetse area which cannot be cleared.

Several other fixed centres operate in Local Authority buildings which are not of a satisfactory standard, improvements to which must be carried out by Medical Field Units staff.

At least one more fixed centre will have to be opened in the future, at Kadelso or Morna, where the new main road to the Northern Territories from Ashanti crosses the Black Volta. The surrounding area at present receives no medical attention except for periodical visits by Medical Field Unit teams.

(ii) TRYPANOSOMIASIS

(a) General

In the Northern Territories, there are little new to report about trypanosomiasis. Cases were discovered on routine examination in the field and at fixed centres, but much field work, both in the North-east and North-west regions, was conducted in areas almost free from trypanosomiasis. No notable focus of infection, (such as was found in the Bawku district in 1953), came to light. The Department of Tsetse Control is now at work in the North-east, and keeps a close watch on the survey figures.

By a longstanding arrangement, the Medical Field Units are responsible for the diagnosis and treatment of trypanosomiasis at Wa, Lawra and Yendi hospitals, but not at Navrongo, Bawku, Bolgatanga, Tamale, or Jirapa. There would be certain advantages in having Medical Field Units staff in charge of trypanosomiasis diagnosis and treatment at all hospitals in the Northern Territories, but due to the present staff position this cannot be envisaged.

Mel B was tried in a few serious cases, who had not responded to treatment with tryparsamide. At Gambaga four cases were given Mel B. Two died, and the others showed little improvement. It cannot be said that this is a fair trial of the drug, which was used only as a last resort, but medical staff are not available to conduct controlled clinical drug trials.

In Togoland (except Krachi), 3 cases of trypanosomiasis were found throughout the year. Of these, it appeared that two had acquired their infection locally. There is no danger of an outbreak of trypanosomiasis in Togoland at present. Nevertheless, for the future it must be borne in mind that trypanosomiasis follows lines of communication, and that communications in the region are being developed rapidly.

A factor which might be even more important is the Volta River Project. Heavy riverine traffic would be an ideal means of propagating trypanosomiasis, and in estimating the medical risks inherent in the project this was considered to be the most serious. It is an anticipated risk, and the means to combat it are planned. It should not give rise to excessive apprehension provided it is never forgotten. The necessary control measures depend on a close liaison between the medical authorities of the Project, the Department of Tsetse Control and the Medical Field Units. If either of the two Government organisations were weakened in the Northern Territories or in Ashanti, the implications would be extremely serious.

At the Journées Medicales which preceded the Leopoldville conference on Onchocerciasis, one of the subjects was "The Decline and Residual Danger of Trypanosomiasis". A paper was submitted by the Specialist Epidemiologist of which the main points were as follows:—

- (1) The present very low general endemic level of Trypanosomiasis in former epidemic areas in the savannah, and longstanding endemic areas in the forest;
- (2) The importance of lines of communication, specially in maintaining infection in the forest;
- (3) The difficulty of reducing the endemic level still more without very great expense. The consequent necessity of not relaxing existing control measures;
- (4) The recent discovery of localised, intractable epidemics of trypanosomiasis in the forest, and the danger that large centres of population might suffer similar epidemics.

A paper was read by Colonel Massequin, Director of S.G.H.M.P., giving a survey of conditions in French West Africa remarkably similar in all ways, although French control measures differ somewhat from those employed in the Gold Coast. It is clear that the decline of the great West African epidemic of trypanosomiasis must be considered as a whole, just like its rise. At a later meeting at Bobo Dioulasso between Colonel Massequin, the Specialist Epidemiologist and the Medical Officer in charge of Ashanti Region, a closer liaison between Medical Field Units and the S.G.H.M.P. over itinerant trypanosomiasis cases was arranged.

(b) *Trypanosomiasis in Ashanti**Epidemiology and Distribution*

Trypanosomiasis is predominantly a disease of lines of communication in Ashanti. The following table which refers to areas surveyed in Eastern Ashanti illustrates this point.

(a)

ROADSIDE VILLAGE COMMUNITIES VILLAGES ON THE ROAD AND WITHIN 5 MILES		
Population	Cases	Infection
20,563	88	·43%

(b)

VILLAGES OFF THE MAIN ROAD— MORE THAN 5 MILES		
Population	Cases	Infection
18,409	25	·14%

An exact comparison cannot be made between the two different communities for their composition in age and sex groups is not always identical; nevertheless even when these variations are taken into account and strictly comparable groups are compared there is still a well marked preponderance of infection along the road. This particular characteristic of Ashanti Sleeping Sickness has been suspected for a long time; 15 years ago when some 2 per cent of migrant labourers passing down these roads from the north were reported infected, the relatively great number of cases found along the roads might have been due to either:—

(a) cases from among these travellers being found on survey

or

(b) a spread of infection occurring from these persons around the route along which they passed.

Nowadays imported infection is very much less since the endemic areas of trypanosomiasis in the north have been extensively controlled. Moreover it is known that nearly all the cases now found on survey have been infected locally. The predominance of infection on lines of traffic might be due to:—

(a) the introduction of a strain of trypanosomes new to the district, albeit at a low rate, which spreads more rapidly in its new medium than the indigenous strain.

(b) different conditions prevailing along the roads from those found in the bush beyond; either a more dense population leading to a closer man/fly contact, or the greater farming activity that a main road stimulates leading to more frequent association with tsetse.

These matters are receiving consideration, and where possible appropriate investigations are being carried out.

Another feature of sleeping sickness in Ashanti is that each locality has its own incidence which is controlled by unknown limiting factors. In one place conditions may permit a very low degree of infection, in another the incidence may be able to reach a higher level but in every instance it is thought that the treatment of cases found on survey has little permanent effect on the incidence. Other things being equal the basic rate of an area re-establishes itself sooner or later after mass treatment is completed. This will be referred to again later. Evidence in support is given below:—

INCIDENCE OF SLEEPING SICKNESS IN THE
EJURA AREA 1949-1954 FOUND ON SURVEY

Year	Population examined	Cases	Incidence per cent
1949	3,317	17	·51
1950	3,391	21	·61
1952	3,856	19	·49
1954	4,544	14	·31

It can hardly be claimed that the infection has been notably reduced by the treatment which followed the surveys, particularly when it is recalled that a sleeping sickness treatment centre has been maintained for some years in Ejura town.

In Ashanti trypanosomiasis is mainly a disease of the eastern side of the country through which runs the main road from Kumasi to Tamale and the north. During the year a survey has been made in the Wenchi area through which passes a second but less important road from Kumasi to the north. In the 50 miles of this road that were surveyed no infection was found.

Spot maps of the places of origin of cases diagnosed at fixed centres have been very useful in planning future field work.

The survey findings in Ashanti Akim show that the Ashanti forest is not inimical to the transmission of trypanosomiasis. The survey teams found 160 cases in a population of 80,000 persons examined, an incidence of 0·2 per cent. This is in very close agreement with the yearly average incidence since 1949. Locally there are considerable variations but it seems reasonable to suppose that by and large throughout Ashanti about one person in 500 has trypanosomes either in his blood or lymphatic glands. In a population of one million in Ashanti, it may well be that there are over 1,000 cases. This calculation does not take into account the extent that the incidence found on survey is short of the true figure, due to cases being missed from scanty infections, periodicity of trypanosomes in the blood or faulty examinations, this error being variously estimated at up to 30 per cent of the total. Nor does it take into account the number of cases who have passed into the late stage of the disease and in whom peripheral trypanosomes are not found. The presence of several hundreds or even a thousand or two of cases need not give rise to alarm. It may be that the number has not been so modest for many years and there is no evidence that, except in one or two well

defined areas, the disease is spreading; on the contrary, the strain of trypanosome appears to be of low endemicity. This would explain how the infection remains low in Ashanti Akim, for example, where the disease has certainly not been recently introduced; human interference with its progress has only been attempted in 1954, and infection remains low.

Broadly speaking the absence of a higher endemic rate may be accounted for by:—

- (a) the strain of trypanosome being of low infectivity;
- (b) climatic or other conditions being unsuitable for transmission of the parasite by the vector;
- (c) some sort of resistance to infection in the local people.

It has already been said that each locality seems to permit its own peculiar rate of infection. This may vary from one village to its neighbour and from records it is clear that in consecutive surveys in any area the same small localities are repeatedly picked out. The extent to which this may occur is variable, but there are one or two places in Ashanti where a group of villages together show this characteristic, and when it happens this feature of Ashanti trypanosomiasis is more obvious. The two best examples of this are in the localities of Garadima (4 villages); the findings on repeated surveys are given below:—

INCIDENCE OF TRYPANOSOMIASIS IN (A) GARADIMA AND (B) EDUDWAN SURVEY AREAS OF ASHANTI—
(SURVEYS 1949–1954)

(a) GARADIMA

Year	Population	Cases	Incidence per cent.
1952, July	2,169	30	1.38
1952, December	2,070	14	.68
1953, July	1,040	6	.58 (2 villages)
1954, April	2,220	13	.60
1954, November	2,114	10	.47

(b) EDUDWAN

Year	Population	Cases	Incidence per cent.
1949	1,072	21	1.96
1950	1,689	6	.35
1952	2,068	13	.63
1954	2,062	31	1.5

The previous comment on the inability of mass treatment of cases to make a lasting reduction in the incidence of trypanosomiasis in Ashanti is borne out by this table, particularly in Edudwan, and when it is remembered that the cases were dealt with at six monthly intervals in Garadima the results obtained there also give support to this contention.

The general incidence in most other areas surveyed in Ashanti between 1949 and 1954 has been in the region of 3 per cent. Both Garadima and Edudwan have shown fairly consistently higher infection rates. The reason why these areas have more trypanosomiasis than other localities in their immediate neighbourhoods must lie in a closer man/fly contact, or at least must be in some way due to entomological causes.

It is clear that these little outbreaks have been going on for some years, and it is very interesting to see that there has been in both areas a recent increase in the percentage of cases exhibiting blood infection only, as shown below.

THE PROPORTION OF CASES SHOWING BLOOD INFECTION ONLY IN THE GARADIMA AND EDUDWAN TRYPANOSOMIASIS FOCI COMPARED WITH THAT FOUND ON SURVEY IN THE REST OF ASHANTI

(a) 1949 TO 1953

	Edudwan	Garadima	Rest of Ashanti Survey
Number of cases	40	62	544
Number with Blood Tryps only ..	10	17	144
Percentage with Blood Tryps only ..	25	27	26

(b) 1954

	Edudwan	Garadima	Rest of Ashanti Survey
Number of cases	31	23	93
Blood Tryps only	20	15	20
Percentage with Blood Tryps only ..	65	65	22

It is interesting to have observed this change over in areas of higher incidence, to a preponderance of infection in the blood only. It has been described in other parts of West Africa but this is the first record in Ashanti. It cannot be said that the higher blood rate represents an early stage of an outbreak for in neither Edudwan nor Garadima is the focus just declaring itself. It may be that as a result of a higher rate of transmission a blood-living strain of trypanosome is developing but it is indeed odd that it should appear at the same time in two widely separated areas.

To summarise, trypanosomiasis in Ashanti is closely related to main roads. Whether this is due to particular conditions prevailing along these or to the local spread of an imported vigorous infection is uncertain. The endemic rate is low in the country due to undetermined natural controlling influences, and treatment of cases makes little lasting headway in its further reduction, the incidence natural to a locality rapidly re-establishing itself again. The differences that occur in the infection rates between one place and its near neighbours must be due to variations in entomological conditions, some being more suitable than others in promoting infection. It would appear that where transmission is greatest a strain of trypanosomes is encouraged which makes its appearance more in the blood than in the glands.

The problem created by trypanosomiasis in Ashanti is not that there are a few hundred untreated cases at large but that at some time or another an epidemic strain may develop.

(c) Clinical

Some 13 per cent of the cases seen on survey gave no history of illness. This is lower than in previous years, but some of the patients gave very unreliable histories and the change cannot be regarded as significant. The disease certainly appears to be relatively benign in most cases in the early stages. What happens to untreated patients is quite uncertain; possibly a number recover spontaneously; whilst others may live in apparent harmony with their disease for years before passing into the late stages. Naturally very few opportunities are afforded to watch the course of the untreated disease; there has been only one in the last four or five years in Ashanti. (A girl of 12 was found with gland trypanosomes at Kadelso, a village on the Black Volta, 50 miles north of Kintampo, in May, 1950. She neglected to take treatment and was re-discovered two years later, in apparently good health with trypanosomes still in the glands though the Cerebro-spinal Fluid showed 51 cells per c.mm. and the protein 26 mg. per cent. An interesting point was that the girl had failed to infect others in this riverside village though there was an abundance of *G. tachinoides* around the water collecting points.) In many instances there is some delay between diagnosis of cases and the beginning of their treatment; during the year no patient died in this period. That the strain of trypanosome in Ashanti is not, at the moment, a virulent one is clear from the information collected in Ashanti Akim during 1954. This area covers about 600 square miles; it is very prosperous with extensive cocoa farms, its population of 30,000 being served by two hospitals and a number of dispensaries. Until the survey made this year trypanosomiasis was believed either not to exist or to be very rare in the district. An infection rate of only 2 per cent, was found but in some of the roadside villages it was much higher and had sleeping sickness been a lethal disease even at the low rates obtaining it would have been known at the local hospitals.

Every year 200 to 300 clinical cases are treated at the fixed centres. These are patients in whom no trypanosomes are found, but who have symptoms suggestive of trypanosomiasis, the diagnoses being confirmed by the discovery of alterations in the protein or cell content of the cerebro-spinal fluid. At the centres the number of clinical cases may seem disproportionately large compared with those in whom trypanosomes are actually found but this is not really so when it is remembered that sick people may have to travel far for medical attention and that patients often seek treatment only when any illness is well established. None the less, trypanosomes would doubtless be discovered in a greater proportion of cases first examined at the fixed centres were it not that many of them have first obtained, generally from some illicit source, one or two injections. About a third of the patients attending for treatment at Abrepo admit to this. In addition stovarsol is widely peddled in Ashanti and the effect of this together with that of acetylarsan, N.A.B. or other arsenicals by injection must be to mask infection and perhaps create a strain of arsenic-fast trypanosomes though there is not much real evidence that Field Units are dealing with strains resistant to treatment. The matter has not been carefully investigated but occasionally an obvious instance is found. One boy, the son of a hospital employee, required a course of tryparsamide, and after the sixth injection trypanosomes were still found in the blood; it seems possible that this arsenic resistance may have developed as a result of some previous treatment.

Between July, 1952 and July, 1954, 14 women of child bearing age were discovered with trypanosomiasis in the village of Garadima. Of the eight who remain in the district five have borne children since ending their course of treatment. In one case the mother was well advanced in her pregnancy when the diagnosis of trypanosomiasis was made and the child died two months after delivery but there was no evidence that the infant had acquired the disease congenitally. The other four have healthy babies. One patient was found with blood trypanosomes in January, 1953; the cerebro-spinal fluid contained 108 cells and 40 mg. protein per cent and she was treated with tryparsamide. Within a year of ending the course she had conceived twins, not uniovular but binovular. It certainly seems that these cases are no less fertile than other women.

(d) Diagnosis

In the field a method of secret checking to maintain standards of careful microscopy is used. Generally in Ashanti blood films have been examined from all persons seen on survey. It is hoped to switch over to the system of gland puncture with blood examinations only in "suspects", persons with enlarged glands and those appearing unwell, for the discovery of cases. It is clear that this would not be applicable if there was any reason to suppose that the number of persons with trypanosomes only in the blood was increasing, as appears to be the case in the two areas of Ashanti already mentioned.

In the fixed centres most of the cases seen are already in the late stages of the disease and the diagnosis depends on the person in charge having had sufficient experience of sleeping sickness to recognise them clinically. These diagnoses are confirmed by examination of the cerebro-spinal fluid.

In the 1953 Annual Report of Medical Field Units, there were some details of the diagnosis of sleeping sickness in the absence of trypanosomes which may be repeated here. The diagnosis of late cases, in whom trypanosomes are not found, is made on cerebro-spinal fluid findings of more than 29 cells per c.mm. and protein of more than 22 mgm. per cent. In a follow-up of cases treated at Abrepo Centre, the following were the comparative results in cases showing and not showing trypanosomes on first examination.

Cases	AVERAGE FINDINGS			
	Before Treatment		After Treatment	
	Cells/c.mm.	Mgm. protein percentage	Cells/c.mm.	Mgm. protein percentage
With trypanosomes (65 cases) . .	194	36	6.4	23
Without trypanosomes (45 cases)	95	45	3.4	26

This table gives strong support to the diagnosis of trypanosomiasis by cerebro-spinal fluid findings in the absence of trypanosomes. It can also be added that clinical checks on patients under treatment at centres seldom reveal any case of other diagnosable neurological disease.

In Kintampo guinea pig inoculation has been tried in doubtful cases but with little success in discovering trypanosomes. During the year a technique of Neujean was employed in one case, injection of air being made intrathecally after the removal of a specific quantity of cerebro-spinal fluid in the expectation that the second specimen of fluid might contain Mott Cells. In this case none were found, and the patient became quite ill for a few moments with vomiting and severe headache.

(e) Treatment

Pentamidine (eight daily injections at dose of 4 mg. per kilo) is being introduced in place of the standard antrypol course of treatment for early field diagnosed cases. This will allow treatment teams to move about more quickly and possibly keep pace with the survey unless there are a number of patients needing tryparsamide who cannot be treated elsewhere. It is hoped that it will soon be possible to lumbar puncture all field cases the day after diagnosis and start treatment immediately.

Late cases continue to receive 10 to 12 injections of tryparsamide (up to 2G) at weekly intervals.

Mel B. has occasionally been used in Kintampo, but the number of cases in whom the use of this highly toxic drug is either needed or justified remains very small.

(f) Results of Treatment

Mortality among cases under treatment is low. Among the 160 cases treated by the field teams there were two deaths: both were in the early stage and both were being treated with antrypol; one developed oedema after the second injection, the other received only one dose, attended for no further treatment, and was reported to have died three weeks later. It is very likely that both cases succumbed to the toxic effects of antrypol.

There were a number of deaths in patients being treated with tryparsamide. Mortality is about 3 per cent of the cases treated at the fixed centres, where most of the tryparsamide treatment is given. Below is an analysis of the Abrepo deaths in 1954, showing the stage in the course of treatment with tryparsamide at which death took place:—

State in the Course						Deaths
After 1 injection	..	..	..	..	..	6
After 2 injections	..	..	..	..	..	1
After 4 injections	..	..	..	..	..	1
After 7 injections	..	..	..	..	..	1
After 12 injections	..	..	..	..	..	1

The effect of the first injection of tryparsamide particularly in cases who are fairly ill, is too often fatal. In an effort to reduce this mortality all late cases are now receiving a first injection of antrypol followed by a rest of a fortnight before commencing their course of tryparsamide.

Late results of treatment, assessed by following up patients at lengthening periods after the completion of treatment are not easily obtained. About a third of the cases of trypanosomiasis occurring in Ashanti are in immigrant labourers who cannot always be found. In addition the few cases that do occur are so scattered that an *ad hoc* follow up is costly, though the field treatment teams which follow behind the surveys are provided with information from the office about old cases found on previous surveys or who have attended at any of the centres in the area in which they are working, and they try to find them. In November, advantage was taken of the two concentrations of cases that have been discovered in recent years at Garadima and Edudwan, to try to assess the results of treatment. Of the 136 patients 84 had been regarded as in the early stage and treated with antrypol; only 53 of these were seen, 5 had died and 26 had left the area. Of the 46 late cases 24 were seen, one other had died and 21 had left. Six other patients are not included as they either took no treatment or defaulted during the course. One of these who did not attend for any treatment is known to have died within a year of the discovery of his disease.

It is obviously unjustifiable to offer any firm opinion on the effect of treatment when only 83 of a total of 130 cases treated can be accounted for. It is not certain that all the 6 deaths were due to trypanosomiasis. The assessment of cases seen on follow up is made on the clinical condition of the patient together with cerebro-spinal fluid findings, as lumbar punctures were made on all except a very few of the cases. Some of the patients had taken further treatment after their first course but these were few.

Of the 39 cases treated more than 2 years ago and whose present state is accurately known,

- 30 are well ;
- 4 have not fully recovered ;
- 5 have died.

Of the 44 cases treated less than 3 years ago and whose present state is known,

- 37 are well ;
- 6 are not fully recovered ;
- 1 has died.

Of this latter group of six not fully recovered cases, 3 may be re-infections. They are Garadima cases in whom cerebro-spinal fluid changes were apparent at the time of the diagnosis in April 1954. After treatment their cell and protein contents had returned to normal. In November, 1954, all showed blood trypanosomes (glands negative) and the cerebro-spinal fluid cell count was normal in two ; the third was a contaminated specimen. This certainly suggests a re-infection with the blood-loving strain of trypanosome which was making itself apparent in the new cases found in Garadima in November, 1954.

(iii) YAWS

The routine treatment of yaws with Penicillin Aluminium Monostearate was commenced before the end of 1953, but so late that development of this exciting project can be regarded as falling almost entirely within 1954.

The treatment of yaws by systematic campaigns in the field began in 1944, when a campaign was started in the Yendi district of Eastern Dagomba, by the Medical Officer. Acetylarsan was the drug used. At the end of the war, Yendi was left without a Medical Officer for some years and the yaws campaign was turned over to the charge of the Trypanosomiasis Campaign. The latter had at the time only one doctor for all its work in Ashanti and the Northern Territories, and he was unable to give much attention to the Yendi district. In the end the Yendi campaign was discontinued, and it has been quite impossible to assess whether it did any good or not. It can, however, be remembered as a warning against initiating projects without regard to continuity.

The Trypanosomiasis Campaign acquired a number of trained junior officers from the Yendi campaign and rechristened as the Trypanosomiasis/Yaws Campaign, it added the treatment of yaws to its routine functions. Cases found on survey were referred to ad hoc treatment teams, and treatment was by Bismuth preparations (not Sobita) and Acetylarsan. A constant feature was that more cases than were recorded by the survey presented themselves for treatment. This situation was accepted ; all comers were treated with good clinical results but of course no preventive effect on the incidence of the disease.

Before the use of P.A.M. (Penicillin Aluminium Monostearate) therefore, Medical Field Units had considerable knowledge of the incidence of yaws, area by area, in Ashanti, Togoland and the Northern Territories. The incidence was known to be high throughout Togoland, including the Yendi district. The formation of the Togoland Region of the Medical Field Units gave adequate prospects for the treatment of yaws in southern Togoland, and for the Yendi district a specific yaws campaign was started.

While on leave in 1953, the Specialist Epidemiologist consulted Dr. C. J. Hackett, then Director of the Wellcome Institute, on methods and dosage. The impression left was that the optimum single dose of P.A.M. had not yet been settled, but that the most important features of any yaws campaign are to treat prophylactically latent and developing cases, and to follow up repeatedly any treated area in order to catch relapsed infectious cases before they have time to spread the disease anew.

The discovery of latent cases presents much difficulty. It is now fairly universally recognised that serology has no place in a field yaws campaign. The simplest way of not missing latent cases is that adopted in Haiti, where everyone who has not got overt yaws is regarded as a latent case and given a prophylactic dose of 1 c.c. P.A.M., overt cases being given 2 c.c., a small dose but one which Dr. Hackett appeared to regard favourably.

It is not possible to adopt the Haiti system immediately as a routine, but it was tried out in a relatively isolated area of southern Togoland, and follow up demonstrated that it gave results at least equally as good as those obtained with the other system of dosage tried. The latter consisted of a graduated single dose of up to 4 c.c. P.A.M. for overt cases (according to type of yaws and age) and prophylactic doses, also graduated, for those whose history suggested that they might be incubating or in a latent stage of the disease.

Results with the Haiti system indicated that all the relapsed and fresh cases were children, and that equally good results could be obtained with a lower expenditure of penicillin by regarding as latent cases and contacts only those under puberty who had not got overt yaws. The simplicity of this system, as contrasted with the ponderous questioning of every-one about recent yaws or contact with it, is a great advantage in field work.

The visit of Dr. Hackett, now head of the W.H.O. Section of Treponematoses, to Kintampo coincided most happily with the moment when accumulated field results were sufficient to enable a decision to be made about the optimum method. Discussion with him confirmed the belief in a modified Haiti system, as applied in Gold Coast conditions, and it is now being used in all Medical Field Units work.

Yaws in the Gold Coast varies, as might be expected, with climatic conditions. The extreme north is getting towards the northerly limit of the disease, though one is glad to add that the southerly limit of endemic syphilis is not reached. Between latitudes 10° and 11°N, (the northern frontier of the Gold Coast

being the eleventh parallel) yaws was common only in the Tumu district, and that only because of the absence of medical facilities. P.A.M. treatment, and even Bismuth and Arsenic before the use of P.A.M., showed spectacular and very gratifying results.

Medical Field Units are working also in the Lawra and Frafra districts at this northerly level. In the latter the incidence of yaws is extremely low. It can be hoped that yaws will almost quite vanish north of latitude 10 within the next two years.

In the more southerly part of the Northern Territories, the main focus of yaws is in Eastern Dagomba in the Yendi district, though part of the Wa district shows a rather above average incidence. The latter is explained easily by the immigration of primitive Lobis from the Ivory Coast, and should yield very quickly to a combined campaign, on both sides of the international border. The predilection of yaws for the Yendi district and all the frontier area of Togoland is not so easy to explain. In southern Togoland the climate is more favourable for yaws, but the Yendi district has a typical Northern Territories climate.

Without being dogmatic, two possible reasons may be advanced which may explain the yaws incidence in the Yendi district. Firstly, the water supply of the area is appalling, and washing during the dry season must be no more than an occasional luxury. (This applies also in comparatively yaws-free areas, and does not stand by itself in explanation.) Secondly, just as in the Wa frontier district, there is a primitive tribe of shifting cultivators moving in the area. The more sedentary and advanced Dagombas and Nanumbas suffer equally badly from yaws, but it could be the nomadic Konkombas who keep the infection going.

In Ashanti the more humid climate favours yaws, but the higher proportion of fully clothed children is against it. Its elimination is quite practicable provided follow up of survey and treatment is industriously pursued.

It must, however, be stressed that speed is the essence of a yaws-penicillin campaign. The larger the area that can be treated and followed up, the less the chance of infection creeping back from outside. The Medical Field Units at their present strength may not be quick enough to achieve elimination.

In Togoland, very good results are being achieved, particularly in Krachi (a dry district) and the comparatively isolated areas of Tongu, around the Volta. Elimination will depend on co-operation with a field campaign to be started by the French in Togoland during 1955.

There was an international conference, mainly concerned with treponematoses, at Bobo Dioulasso in December, which was attended by the medical heads of all but one of the French Territories surrounding the Gold Coast, under the chairmanship of Colonel Massequin, Director of S.G.H.M.P. (Service General d'Hygiene Mobile et Prophylaxie). Both the Specialist Epidemiologist and the Medical Officer in charge, Ashanti Region (M.F.U.) attended this conference and were able to show adequate evidence of surveys and yaws campaigns in border areas. The low dosages of P.A.M. used came as a surprise to the conference, but with the support of Dr. Hackett and with the evidence of figures it was not easy to assail them.

Colonel Lotte, head of the medical services in French Togoland, was present at this meeting, and a further meeting with him will be made during 1955, to arrange liaison when he starts a yaws campaign near the common frontier. The head of the French medical services in the Ivory Coast was not present at the conference. This passed almost without comment, as did the fact that in the Gold Coast little or nothing is known about yaws in the south-west frontier area. It may well be that the French side of that frontier is also a medical terra incognita. In passing, it may be remarked that the area around Enchi and in the Axim district, is the remaining part of the Gold Coast which needs the attention of Medical Field Units.

(iv) LEPROSY

The Medical Field Units continue to perform two functions in relation to leprosy, plotting the distribution of the disease by diagnosis during the routine field survey, and conducting clinics for the treatment only of cases living within 10 miles of a fixed centre. It is not possible to treat leprosy in the field, but cases diagnosed on survey are referred to the nearest clinic (if there is one within reach of them).

In Northern Ashanti, Medical Field Units, the Medical Officer, Sunyani and the Leprosy service have between them set up clinics covering most of the country. Medical Field Units opened two new ones during 1954, to fill up small gaps in this service. One is at Jema, twelve miles from Kintampo on the Kumasi road, and the other is north-west of Kintampo at Baniantwi in the Mo area. Treatment with D.D.S. is given twice weekly at fixed centres, and weekly at Jema and Baniantwi (which are visited from Kintampo).

The rigid rule of treating only genuine local inhabitants at Medical Field Units clinics has now been relaxed, but with great caution. Neither an uncontrolled influx of lepers to the neighbourhood of our clinics is desired nor casual patients who desert when partially treated. As it is, reattendance at every Medical Field Units clinic is nearly 100 per cent throughout the year. Cures are being affected, though experience is proving that even the mildest case needs from eighteen months to two years treatment.

Up to the end of 1953, 65 cases had been discharged as cured from the Kintampo clinic (which is 4½ years old). These discharged cases were called for re-examination twice during 1954, and the attendances were 56 and 61. This reattendance rate, after discharge, speaks for itself as an argument in favour of clinics dealing only with local inhabitants. Nine of the 65 had to be readmitted to treatment.

The new fixed centre at Tumu has taken on the treatment of leprosy there. In all, the Medical Field Units run leprosy clinics at 14 fixed centres or hospitals. Hospital clinic figures will not be included in our tables, being rendered by the Medical Officers concerned. In the field, cases are recorded as lepromatous or non-lepromatous. Lepromatous cases amount to about 4 per cent of the total.

One of the 10,000*Photograph of patient with large left temporal nodule**Stone Blind to 6/36 in 6 weeks**Photograph of patient after treatment*

The microfilariae of *Onchocerca volvulus* were first seen in 1875, from the skin of a native of the Gold Coast. When civil administration was set up in the Northern Territories, in 1906, it was soon noticed by District Commissioners (at least in the Tumu district) that many villages showed a most abnormal rate of blindness. The existence of Onchocercal blindness in the western Northern Territories was noted by Dr. C. F. T. Saunders in 1932, but the trypanosomiasis epidemic was then at its height and Dr. Saunders was fully pre-occupied with that disease. Onchocerciasis, therefore, was forgotten again, until it was virtually rediscovered by A. Ridley, F.R.C.S., then an Army eye surgeon, who noted the association of deficient vision with Onchocerciasis in soldiers from the Northern Territories. He was put in touch with Dr. Saunders, and as a result of information given by the latter he conducted an investigation at Finsi in the Wa district and published the results in 1945.

This was the period of post-war shortage of medical staff, and of the great epidemics of cerebro-spinal meningitis. No follow up of Ridley's work could be done at the time. The 1948 census revealed abnormal blindness in the Northern Territories, mainly north of latitude 10°. The Specialist Epidemiologist, at that time Medical Officer of Health, Northern Territories, spent some time investigating the distribution of onchocerciasis in 1948, and in 1949 was given permission to do a full-time investigation for six weeks.

The attention of the British Empire Society for the Blind was attracted, and a mission consisting of an Ophthalmologist, and an Entomologist, working independently, came out to the Gold Coast in 1952. Dr. G. Crisp, the entomologist, has succeeded in the difficult task of working out the life cycle of *Simulium damnosum*, which appears to be the only vector in the Gold Coast. As a result of his work it may be practicable to plan a campaign for the control of *Simulium* in the Gold Coast or, if international boundaries can be surmounted, for the elimination of the fly from West Africa.

The endemic area of onchocerciasis, with ocular complications in West Africa is roughly the entire inside of the Niger bend and further east of that into French Equatorial Africa, between latitudes 8° and 15° North. Blindness rates of 10 per cent in Gold Coast villages are surpassed by those in some French ones. With full information now available about the scale on which the disease occurs and causes blindness and depopulation, onchocerciasis has suddenly been revealed as perhaps the last of the great plagues of man in Africa to come to light.

Before the arrival of the British Empire Society for the Blind mission the Government ophthalmologist was experimenting with the treatment of onchocerciasis using antrypol and banocide, and eventually recommended to the Medical Field Units the use of antrypol. The course he recommended was too toxic to be used in field conditions, but with the old well-tried course as used for trypanosomiasis Medical Field Units began experimental mass treatment in the Tumu district.

It is necessary to say that nobody had expected any form of treatment to help the individual case of blindness, and that no doctor has ever been available to supervise Medical Field Units work in the north-west. This has to be put forward as the reason why no tests of visual acuity were done before treating cases.

It soon became obvious that the treatment was extremely popular in the Tumu district, but without a doctor to follow up cases, results could not be assessed; antrypol kills adult worms but not microfilariae, and positive skin snips after treatment must be expected for the full duration of the individual microfilarial life of perhaps 18 months.

The full extent of what is happening with antrypol treatment was revealed late in 1954, by two events. Firstly, a man who came to Kintampo stone blind rapidly recovered vision of 6/36 after a course of antrypol. At much the same time the chief of Tumu summoned the Specialist Epidemiologist to show him a man who had been blind two years ago but who, after antrypol treatment had gone back to his old trade of hunting. It is said that such cases are common in the Tumu district, but clinical follow up with the present limited medical staff is impossible.

In the light of present knowledge, it is not considered that banocide (or hetrazan) is a drug suitable for general use in the field, without constant medical supervision. It has its valuable place in hospital practice, but its toxic side effects (including a serious ocular reaction of a Herxheimer type) might do more harm than good in the field.

Only at the W.H.O. conference on onchocerciasis in September were the great possibilities of nodulectomy, both as a therapeutic and prophylactic measure, realised by Gold Coast delegates. Medical Field Units since then have been anxious to start mass nodulectomy campaigns in the worst onchocerciasis areas. The instruments have been obtained and are ready in the selected places, but it has not yet been possible to begin work because of the lack of medical staff.

As regards onchocerciasis, therefore, the position is that there are more than 10,000 stone blind persons in the Northern Territories, at least the same number with seriously affected vision, and more becoming so month by month. An unknown percentage of this vast hopeless throng can, by antrypol therapy, nodulectomy or both, have restored at least sufficient vision to see their farms, their relatives and their road. Every one of them ought to be given the chance of this, as soon as possible; for their own benefit and for the economy of the Gold Coast this is a most urgent medical need.

(vi) GUINEA-WORM

Guinea-worm is possibly the most crippling of all the endemic diseases of the Gold Coast. Full recovery from the effects of a single guinea-worm near the ankle or the knee may take four years, and the eruption of multiple guinea-worms causes 100 percent disability for months. It can be estimated that in the Northern Territories alone some 10,000 adults are completely disabled throughout each farming season and some 90,000 partially disabled. The disease is not confined to the North; it is equally common in other parts of the country, wherever pond water supply is relied on. The total loss to the Gold Coast's labour effort is enormous.

Pipe borne water supplies would, of course, eliminate guinea-worm but the dams and waterholes which form so large a part of the present development of water supplies in rural areas can only accentuate its incidence, a very grave implication.

In 1952 the Medical Field Units made the experiment of adding wettable D.D.T. to pond water in an area of Mo where guinea-worm was extremely common. The results indicate that by this simple method it might be possible to eliminate the disease altogether from the Gold Coast in two or three years, if sufficient staff could be devoted to the task.

(vii) BILHARZIA

The distribution of bilharzia in the Gold Coast has been known roughly, through hospital attendances, for many years. Nothing, however, has been published about it, and this has been a source of complaint in publications about bilharzia in Africa.

For the last two years survey work has been proceeding independently by the Medical Field Units and the Medical Biologist, and it will soon be possible to publish the distribution of the disease in the Gold Coast.

It has been found possible in some areas to include bilharzia (at least urinary) in routine field surveys. An *ad hoc* survey in schools is being conducted in the Northern Territories. It has been almost completed in the North-east, and is progressing well in the North-west.

Incidental to the schools survey is the collection of height, weight and other physical measurements, normal averages for which in Northern Territories children have never been published.

In the North-east, there is a sharp and absolute demarcation line of bilharzia incidence at the Gambaga scarp. This makes possible a comparison of children's growth rates in 100 per cent and 0 per cent endemic areas; other differences in growth rates that may emerge will not necessarily be due to bilharzia. Nevertheless, the comparison will be interesting.

The disablement, if any, resulting from bilharzia infection has never been estimated. It can hardly be believed that the presence in the internal organs of a mass of worms does no harm at all, but no experiment yet published has given a clear indication of any. It can be assured, therefore, that the indigenous population is not affected to an extent such as would make the elimination of the disease a matter of urgency equal to that of yaws, guinea-worm, and onchocerciasis.

This is a point of importance in relation to the Volta River Project. The effect of the latter on bilharzia incidence in the Gold Coast cannot be estimated, and might be great. The control of bilharzia has been achieved nowhere in the world so far, but fortunately the possibility of increasing the disease need not be regarded as a bar to proceeding with the Ajena dam.

During the schools survey of the North-east, a number of cases of *mansoni* infection in urine were diagnosed. This is a site for *mansoni* infection that the usual textbooks do not mention, but enquiry at the Leopoldville Journees Medicales elicited the information that *s. mansoni* is found in the bladder as much as anywhere else; however, the laterally spined egg apparently does not easily pierce the bladder mucosa and escape.

(viii) HOOKWORM

*Photograph of patient*

Hookworm infection produces symptoms in relation to the load of worms carried. Little attention has been paid to it in the Gold Coast, the general assumption being that it is usually a very mild infection in this country. About 1946 Dr. M. P. Browne reported on hookworm as a serious rural disease in the humid Axim district. In hospital practice in the Northern Territories, in practice among soldiers of the Gold Coast and Nigerian Regiments and in any outpatient practice from northern Ashanti northwards, the finding of a few hookworm ova in the stools is more common than not, the apparent resulting disability being nil.

Occasional severe cases are seen in hospital and outpatient practice, whose treatment presents a problem. It is dangerous to treat them before improving their general condition, and difficult to improve their general condition before treating them.

During 1954 at Kintampo, hookworm serious enough to necessitate treatment has been seen more frequently than was expected, and it is now believed that it is a condition to be reckoned with in the Gold Coast. This area is, after all, much too dry to be ideal for hookworm to flourish, and as the more humid south is approached this disease may be a common and serious cause of disability.

It has been established in South America that the only way to control hookworm is by issuing shoes to school children. The larvae cannot then penetrate their feet, and the cycle is prevented at least during the years of growth and learning. It is considered worth while to insert a photograph of a school-child suffering from hookworm (and no other disability, as far as could be observed). The thin, listless face was very striking, and so was the improvement in physical and mental fitness after treatment. Consideration might be given to adding a few shillings per head to the national bill for education by issuing shoes to all pupils.

Hookworm is not looked for in Medical Field Units routine field surveys. 61 cases were considered serious enough to need treatment at Kintampo, out of 172 diagnosed on stool examination. The figures may not look impressive, but they were obtained in a small outpatient practice by routine examination; the improvement in general condition after treatment was striking and it is believed that thousands more such cases could be found if they were looked for.

(ix) EPIDEMIC DISEASES AND VACCINATION

Smallpox was known in the Gold Coast bush long before this was opened up by the arrival of the European. The scars of prophylactic inoculation can be seen on the wrists of old men in some areas. Intensive vaccination in rural areas at least in the Northern Territories, was begun only after the recent war, and between 1940 and 1948 there were numbers of epidemics in all parts of the country, of which that in the Frafra area in 1947-48 (651 cases with 120 deaths) was probably the most severe.

In dry regions, smallpox is (like other respiratory infections) a disease of the dry season, but unlike cerebro-spinal meningitis it is not confined to arid areas, but can be most obstinately endemic-epidemic in forest and coastal regions. It is doubtful if any part of the Gold Coast has escaped epidemics.

Since 1948 epidemic smallpox has been introduced into the Northern Territories several times, but every time it has died out without affecting many people. This can be claimed as being mainly due to the big effort in vaccination that has been made since the war. There is no reason for complacency; the effort must be kept up, for it is by no means impossible that the virus is in a recessive phase at present. Historically, epidemics of smallpox, pneumonia and cerebro-spinal meningitis have tended to occur together in cycles, and it will be interesting to see if the vaccination barrier holds during the next epidemic cycle.

Vaccination has been undertaken by so many different organisations in the Gold Coast that it would be difficult to give an exact figure of the number that have been performed since the war. In the Northern Territories, especially in epidemic times, statistics often have been but a secondary consideration. It can be said with confidence that all the frontier areas of the Gold Coast have been vaccinated, with the possible

exception of the Axim district, of which Medical Field Units have no knowledge. Most frontier areas have been vaccinated repeatedly. The occasional introduction of smallpox must be expected, but *if* there is no slackening of effort big epidemics should be relegated to history.

The Medical Field Units added vaccination to their routine functions in 1951, and every section excepting the yaws campaign does it. The specific mass vaccination campaign closed before the beginning of 1954. We have had results much more satisfactory when using Dakar dried vaccine than with lanolinized lymph.

Unlike smallpox, cerebro-spinal meningitis did not reach the Coast until 1900, and reached its main epidemic area, the western Northern Territories, in 1906. The Nigerian epidemic cycle of the eighteen eighties did not reach the Gold Coast. The last epidemic of the nineteen forties cycle occurred in 1950, but sporadic cases (in some years on a considerable scale) have continued to be reported since then. If any future research on the disease is to be done, it will be handicapped by lack of knowledge of how many of these cases actually were cerebro-spinal meningitis. A large proportion of them is not seen by a doctor. A circular has now been issued by the Ministry of Health asking for classification of meningitis cases, and it is hoped that this will assist later research. It is not possible to predict when cerebro-spinal meningitis is likely to return to the Northern Territories. No information about carrier rates is available and so it cannot be said if the disease is extinct or merely dormant in the main epidemic areas. Enquiries from the French medical authorities at Bobo Dioulasso, did not seem to indicate any present forward march towards the Gold Coast, such as preceded the cycles of 1906-08, 1919-20 and 1939-50.

The Medical Field Units accept the responsibility to drop whatever they are doing, and take on the control of major epidemics in their areas. Fortunately, in recent years there has been no necessity to do this.

Housing progress, which in the long run could rid the Northern Territories of cerebro-spinal meningitis as a major scourge, is proceeding very slowly. But every window that is put into a house in the western Northern Territories is a sign of hope for the future, and it was heartening to see during 1954 how many of the younger chiefs and educated commoners are tending to make windows in their bedrooms.

Measles and the common cold reappeared during 1954, after being absent for some years. Chickenpox has hardly been seen. Whooping cough occurs, but its statistical incidence is unknown.

Five or six years ago, it appeared possible that louse borne relapsing fever, which had been devastating the Sudan, might progress as far as the Gold Coast. Body lice are very uncommon in the Northern Territories but a chain of vaccination and disinfestation stations was designed, to cover the main points of immigration into the Gold Coast; frontier disinfestation has however never been started. It would be a simple matter with the use of D.D.T. powder, and consideration might be given to reviving this project. The persons principally concerned would be the Zabramas from the neighbourhood of Gao, who tend to be lousy and who make for Kumasi in considerable numbers.

(x) STATISTICS

Statistics of Trypanosomiasis, Yaws, Leprosy, Onchocerciasis, Guinea-worm, Bilharzia and of vaccination of Smallpox will be found in Appendix "E".

CHAPTER VII

LABORATORY SERVICES

(i) MEDICAL RESEARCH INSTITUTE

(a) Buildings and Equipment

Extensions and alterations to the buildings were carried out at the cost of approximately £7,300. Four new laboratories were added; three of these accommodate the Malariologist, Biologist and Entomologist respectively who are not members of the Institute staff however; the fourth laboratory is available for visiting workers.

The Library was enlarged and a Librarian's office provided. There will be sufficient shelf space for the next 10 to 15 years.

The old animal house was completely redesigned and mosquito proofed, and separated into breeding and experimental sections. The effect on the breeding stock has been very favourable and for the first time adequate supplies of animals are assured.

The Biochemistry laboratory was partitioned and improved. The store was enlarged. The electrical wiring of the whole Institute was renewed and plug sockets standardised. A washing-up annexe was added to the Bacteriology laboratory. Other minor improvements were carried out in almost every room.

The Medical Research Institute is now better housed and better equipped than at any previous time in its history. If the staff can be brought up to establishment the output of routine and research work should continue to increase satisfactorily.

(b) Scientific Activities

These are recorded in the reports of the separate divisions and in the first 15 reports enumerated in appendix "K". The amount of routine work achieved during the year nearly doubled in many instances that undertaken in 1953, although there was a reduction in the number of pathologists on duty from 2 or 3 to 1 or 2. In these circumstances the output of research work is certain to fall. It is considered that research in an Institute of this type is best encouraged by having a slightly larger staff than is necessitated by the routine work to be done, but this policy has not been possible and the staff has been decreased by the need to open a second laboratory at Kumasi.

*(c) Bacteriology Division**General*

The year was marked by a further welcome increase in the use made of the bacteriological laboratory, especially by doctors in out-stations.

The following table gives statistical expression of these facts.

SUMMARY OF BACTERIOLOGICAL AND SEROLOGICAL EXAMINATIONS

Examination	Total 1952	Total 1953	1954		Total 1954
			Accra specimens	Out-stations specimens	
<i>Cultures</i>					
Blood	201	428	565	178	743
Faeces	371	1178	2010	160	2170
Urine	321	310	755	28	783
Miscellaneous	111	575	990	—	990
Water and minerals	321	331	225	—	225
Veterinary	—	—	201	—	201
Total Cultures	1326	2822	4746	366	5112

SUMMARY OF BACTERIOLOGICAL AND SEROLOGICAL EXAMINATIONS—*contd.*

Examination	Total 1952	Total 1953	1954		Total 1954
			Accra specimens	Out-stations specimens	
Sera. Kahn	7440	6270	4005	1815	5820
Sera. Widal					
Weil-Felix					
Brucella, Typhoid					
Vi and Leptospiral	736	873	566	405	971
agglutinations,					
Paul-Bunnell					
tests, etc.					
Smears stained					
and examined	4067	2147	2247	165	2412
(Sputum, urethra,					
etc.)					
Animals inoculated	138	161	160	—	160
		1954 Totals	11,724	2,751	14,475

There is scope, and indeed urgent need, for further expansion of bacteriological services, particularly for the out stations and in the fields of research and public health. Such expansion will require more staff, and it is considered that there should be two pathologists whose primary interest is bacteriology. The number of specimens received from different out-stations included the following :—

Kumasi (698), Cape Coast (321), Winneba (245), Nsawam (234), Mo (177), Tarkwa (169), Oda (159), Dunkwa (139), Tamale (82), Kibi (78), Sunyani (61), Koforidua (55), Bawku (32), Hohoe (21), Yendi (15), Field Units (14), Bolgatanga (2), Keta (2), Saltpond (2), Mines and missions (66).

Virus Diseases(1) *Smallpox*

A clinically difficult case of modified smallpox was correctly diagnosed by examination of vesicle smears, and was confirmed by egg inoculation. A severe case of chicken-pox gave equivocal smear results, but egg inoculation enabled smallpox to be excluded.

(2) *Rabies*

Three human cases of rabies were encountered at post-mortem, in none of which were Negri bodies demonstrable in brain sections. In two of the cases no history of a dog bite could be elicited from the patient or his friends. In all three cases the diagnosis was confirmed by the inoculation of mice.

In one of the human cases of rabies and in the case of a rabid cat, Negri bodies were not demonstrable until the second intracerebral passage of the virus in mice. In view of the unreliability of negative results in the histological diagnosis of rabies the biological test will be introduced as a routine procedure in 1955, in addition to histological examination. This procedure was previously precluded by lack of experimental animals, due to the unsatisfactory nature of the former animal house.

(3) *Dengue-like Fever*

A widespread epidemic of this disease occurred in March and April throughout the southern part of the forest zone. Because French workers in Brazzaville and Oubangui have reported the isolation of rickettsiae of the boutonneuse and O fever groups from patients with clinically similar diseases, attempts were made to isolate rickettsiae from Gold Coast patients. Guinea pigs were inoculated intraperitoneally with blood from a number of early cases; some guinea pigs became febrile, but in no case were rickettsiae demonstrable. Guinea pigs convalescent after inoculation with the blood of Dengue-like fever patients were not immune to South African tick fever.

Bacterial Diseases(1) *Diphtheria*

Six strains of *Corynebacterium diphtheriae* were isolated during the year, of which one was referable to the *intermedius* type, the remainder being *mitis*. Three of the *mitis* cultures were "avirulent", although in one of the patients palatal palsy ensued. Three deaths from diphtheria occurred in children in Accra, all from laryngeal obstruction.

ROBINSON (Annu. med. sanit. Rep. Gold Cst., 1935, 43.) reported that 83 per cent of children in Accra between 10 and 15 years of age were immune to diphtheria as shown by the Schick test, and that symptomless carriers of *C. diphtheriae* could be found when sought. Children under school age are less accessible than school

children for medical surveys, and an attempt to assess their diphtheria immunity status in 1954 proved difficult, for the mothers often failed to bring the children back for the reading of the test. The following results are of an interim nature only, and it is hoped to expand them when pressure of other duties permits:—

RESULTS OF SCHICK TESTS ON YOUNG CHILDREN IN ACCRA

Age group (verified ages)	Positive (non-immune)	Negative (immune)	Total
0-1	5	9	16
-2	8	5	13
-3	6	4	10
-4	11	8	19
-5	20	15	35
Ages 1-5 Total	45	32	77
Ages 1-5 Per cent	58.4	41.6	

Insofar as conclusions may be drawn from such small numbers it appears that infants under 1 year of age possess a maternally transmitted immunity, as in other countries. This disappears before the end of the first year of life, and about 40 per cent of Accra children acquire immunity through infection between the ages of 1-5 years, probably almost always by the *mitis* type of *C. diphtheriae*. The mortality of *mitis* diphtheria elsewhere is about 2.6 per cent. (McLeod, 1943. Bact. Rev. 7:1); if this figure is applied to the 1948 census figures, which gave the number of children in Accra in the 1-5 age group as 14,085, it may be calculated that about 30 children in this age group die annually from diphtheria in Accra, a rate of 2 per 1000 living.

(2) *Staphylococcus Pyogenes*

The figures in the following table show the results of sensitivity tests to antibiotics, performed by the disc method, with coagulase positive strains of *Staph. pyogenes* in 1954. The 1953 figures are given for comparison.

ANTIBIOTIC RESISTANCE OF STAPH. PYOGENES. 1954

Antibiotic	No. of Strains tested	No. Completely resistant	Per Cent resistant 1954	Per Cent resistant 1953
Penicillin	80	66	82.5	52.9
Streptomycin	80	19	23.6	19.0
Chloramphenicol	80	4	5.0	Nil
Aureomycin	59	6	10.2	33.3

The utility of penicillin for the treatment of staphylococcal infections in Accra has therefore been reduced very markedly during the year, whilst that of other antibiotics has not greatly changed. The increased sensitivity to aureomycin may be apparent only as the 1953 percentage was based on only 21 strains, and aureomycin is notoriously unstable.

(3) *Bacillary Dysentery*

Dysentery bacilli were isolated from the faeces of 114 patients. In 6 of these cases there was coincident infection with one or more members of the *Salmonella* group. *Shigella dysenteriae* type 5 (Large-Sachs Q1030) was isolated on a single occasion, the first record from the Gold Coast of this type. *Sh. Flexneri* type 5 (P119) also made its appearance in Accra in May and became the commonest type thereafter; this type had not previously been recorded here, although it is present in Freetown. All the strains isolated belonged to the sub-type P119 X-, and were indole negative. The type distribution of *Shigella* strains isolated in 1954 is shown below.

TYPES OF SHIGELLA ISOLATED IN ACCRA IN 1954

Type	No. of Patients
<i>Sh. Dysenteriae</i>	2
do.	9
do.	1
<i>Sh. Flexneri</i>	5
do.	30
do.	19
do.	10
do.	25
do.	4
<i>Sh. Boydii</i>	Nil
<i>Sh. Sonnei</i>	9
Total	114

It was noted that bacillary dysentery was three times as common in children of three years of age or less as in older children and adults whose faeces were investigated. This fact, together with the information given below in the paragraph on salmonellosis, should be considered in conjunction with the figures in the nosological tables in successive Annual Reports, in which "diarrhoea and enteritis in children under 2 years of age" accounts for a noteworthy proportion of the total cases treated in all Government dispensaries and hospitals.

(4) Enteric Fever and Salmonellosis

The cases of enteric fever diagnosed are detailed in the following table:—

ENTERIC FEVERS, CASES DIAGNOSED IN 1954 (1953 FIGURES IN BRACKETS)

Method of Diagnosis	Typhoid	Paratyphoid A	Paratyphoid C	<i>Salm Cholerae-suis</i>	<i>Salm Dublin var. Accra</i>	Total
Culture	138 (64)	14 (22)	12 (13)	2 (nil)	4 (2)	171 (101)
Widal	165 (111)	13 (3)	4 (nil)	—	—	182 (114)
Total cases	303 (175)	27 (25)	16 (13)	3 (nil)	4 (2)	353 (215)

Notes: (1) In 3 cases where *Salm. typhi* was isolated, and which are included in the typhoid cases above, a second enteric organism was present, *Salm. paratyphi A*, *paratyphi C* and *dublin* respectively.

(2) A positive Widal test was reported when, in an uninoculated person, there was a rising agglutinin titre, or when a single test showed O agglutinins at 1/160 and/or H agglutinins at 1/320.

The number of cases diagnosed by isolation of the infecting organism was 171, more than three times as many as were diagnosed by this means in any year before 1953. The total number of cases diagnosed by all means was the highest hitherto recorded, and exceeded the total clinical diagnosis of enteric fever from the whole colony for any year before 1948. It is a debatable question whether doctors are becoming more conscious of them. It is perhaps noteworthy that the post-war increase of enteric fever in Accra was coincident with the advent of the uncontrolled sale of ice cream.

Enteric fevers are not confined to Accra, for cases were diagnosed bacteriologically from Kumasi (2), Tamale (2), Nsawam (1), Koforidua (1), Ho (21), Kibi (4), Cape Coast (4), Achimota (4) and Agogo (1). Positive sera were also received from Hohoe, Tarkwa, Winneba, Prestea, Yendi, Bawku, Navrongo, Sunyani, Bolgatanga, Akwatia, Akim-Oda and Konongo. It is thus evident that enteric fevers are endemic throughout the Gold Coast, and it is probable that the morbidity and mortality to which they give rise may be higher than is generally admitted.

As well as the usual isolation from the blood, urine and faeces of enteric fever patients, one strain of *Salm. typhi* was isolated from the cerebro-spinal fluid of a patient presenting as a case of meningitis, and two cases of empyema thoracis proved to be due respectively to *Salm-paratyphi A* and *Salm. cholerae-suis*.

The following 78 strains of normally non-invasive salmonellae were isolated from 68 patients, including nine patients who also harboured one of the organisms mentioned in the table above. Nine of the strains mentioned are new to science.

virchow (13), *typhimurium* (11), *give* (6), *vejele* (6), *Salm. sp.* 6, 7: f, g:—(4), *johannesburg* (4), *Salm. unidentifed* 3, 10: 1, 5 (4) *stanleyville* (3), *takoradi* (3), *enteritidis* (2), *hadar* (2), *victoriaborg*, n. sp. (2), *kaneshie*, n. sp. (2), *ituri* (1), *saint paul* (1), *derby* (1), *tudu* n. sp. (1), *Salm. unidentifed* 6, 7:—(1), *oranienburg* (1), *labadi* n. sp. (1), *ridge* n. sp. (1), *rubislaw* (1), *ibadan* (1), *fanti* n. sp. (1), *Salm. unidentifed* 13, 22:—(1), *buzu* n. sp. (1), *Salm. sp.* 17: a: 1, 5 (1), *guinea* n. sp. (1), *christiansborg* n. sp. (1).

Salmonella infections, like those caused by *Shigellae*, were more frequent in small children than in persons of other age groups. 39 cases of salmonellosis in children under two years of age were diagnosed, and several of them proved fatal.

In addition to the strains from human sources, *Salm. dublin* var. *accra* and var. *dawa* were isolated from cattle; *Salm. typhimurium* from dying chicks; *Salm. virchow* from a healthy hen; *Salm. rubislaw* from a healthy dog. No widespread survey of animal reservoirs of *Salmonellae* has yet been undertaken in the Gold Coast, but the matter is one of considerable mutual importance to the Ministry of Health and to the Departments of Animal Health and Agriculture; the control of human salmonellosis is impossible without knowledge of the animal infections. The *Salmonella* types isolated from human sources during the 27 months ending December, 1954, will probably number between 35 and 40 when all cultures have been fully identified.

(5) Brucellosis

A patient at Kibi showed the following reactions in sera sent to Accra:—5-5-54 *Brucella abortus* agglutinated at 1/80 *Br. malitensis* negative 17-5-54 *Br. abortus* 1/320. *Br. melitensis* 1/40.

Attempts to recover a strain of *Brucella* from the blood were unsuccessful. It seems likely that this was a case of *abortus* fever, not previously recorded in man in this country.

(6) *Anthrax*

A fatal case of intestinal anthrax came to necropsy, from which the causative organism was recovered. Presumably the deceased ate meat infected with *B anthracis*: It may be taken as certain that he did not eat the whole carcase himself, and in this case, as in the sporadic cases of human anthrax which are seen almost every year in Accra, it is interesting to speculate on the fate of those who shared the meat with the man who became infected. It seems likely that the ingestion of *B anthracis* by man only results in infection in a relatively small proportion of cases.

(7) *Clostridia*

Spoilage of bread at Achimota School was investigated and shown to be due to *Cl. Welchii* contamination. This organism was also isolated from the dried yeast pellets used in making the bread.

A woman with typhoid fever came to Accra from the bush and was given an injection by an unregistered practitioner. She was brought to hospital on the point of death and post-mortem examination showed the primary cause to be gas gangrene originating from the left buttock. The following unusual combination of pathogens was isolated; *Salm. typhi*, *Cl. welchii* and *Cl. carnis*. Whether by sepsis or chemical poisoning illegal injectors are becoming each year an ever more serious menace to the lives of their ignorant and credulous customers.

(8) *Treponematoses*

The steady fall in the numbers of sera submitted for the Kahn test, which has continued without a break since 1948, was again noted in 1954. The number of sera giving positive results showed a parallel decline. It is interesting to note that the Chief Pathologist in Nigeria recorded the same phenomenon in his Annual Report in 1953. It seems probable that yaws is declining in intensity in West Africa following 30 years of chemotherapy, and that the consequent reduction in the transmission rate will lead to a further automatic decrease in fresh cases irrespective of future treatment campaigns. This should be borne in mind in assessing the value of such campaigns.

Not only are apparently syphilitic aneurysms rather frequently seen at necropsy, but primary chancres occur in Accra. Although only 12 men were sent to the laboratory for dark field investigation of penile sores, nine of these were positive. It seems possible that the alleged rarity of syphilis in the Gold Coast may be a medical myth.

(9) *Blood Cultures*

743 specimens of venous blood, or of blood clot from Widal specimens, were cultured. In 463 cultures made by the laboratory staff by the method described by Hughes (1953 W. Afr. Med. J. 2. 94) the contamination rate was 5 per cent.

The following pathogenic bacteria were isolated:—

Organism	No. of Isolations
<i>Salm. typhi</i>	101
<i>Salm. paratyphi A</i>	13
<i>Salm. paratyphi C</i>	9
<i>Salm. cholerae-suis</i>	2
<i>Salm. dublin var accra</i>	1
<i>Staph. pyogenes</i>	17
<i>Strep. faecalis</i>	3
<i>Haem. influenzae</i>	2
Total positive cultures	148
Per cent positive	19.9%

(10) *Faecal Cultures*

Of 2,170 specimens cultured, 115 yielded *Shigellae* (5.3 per cent) and 185 yielded *Salmonellae* (8.5 per cent). Bacteria of the paracolon group were frequently encountered. No attempt has yet been made to identify pathogenic strains of *Bact. Coli* in infantile diarrhoea.

(11) *Yellow Fever Vaccination*

527 vaccinations were performed with vaccine obtained through the Medical Stores from the South African Institute for Medical Research. 54 vaccination sessions were held.

(d) *Biochemical Division*

Work has been hampered by building alterations during the year and difficulty was met in coping with the increased routine procedures of which 3,175 were performed in 1954 compared with 2,218 in 1953. 928 male toad pregnancy tests were done.

The routine methods in use in the laboratory appear to be satisfactory, but require expansion. It is hoped to introduce paper electrophoretic procedures and satisfactory sodium and potassium estimations next year. Methods for estimating acetone bodies in serum and alkali reserve (titration method) have been instituted. Considerable difficulty was experienced in preparing the gold-sol for the colloidal gold test, and as the test was infrequently asked for, it has been discontinued.

During the year two patients suffering from porphyrinuria were seen and Bence-Jones proteose was found in the urine of a third.

The small staff prohibits the performance of occasional tests and the following requests by clinicians had to be refused.—pyruvic acid, lipides, potassium and 17-keto steroids.

The total tests performed are shown in Appendix "F".

(e) *Haematology Division*(1) *General*

The number of routine procedures performed has almost doubled, the total for 1954 being 6,718 compared with 3,396, in 1953. The greatest increase has been in blood and rhesus grouping. The incidence of the blood and rhesus (anti-D) groups in the Africans tested is shown below and the results compared with similar figures from Lagos (Winston, 1954). Rhesus grouping was performed using in-albumin anti-D serum prepared by the Blood Group Reference Laboratory, Lister Institute, London.

In every case the rhesus negative results were confirmed by the use of anti-human globulin serum (indirect Coombs test). Appropriate negative and positive controls were employed at all times.

The following Table makes a comparison of 1,000 tests of West Africans of Lagos and 1,540 of Accra with anti A and B sera and of 1,000 West Africans of Lagos and 805 of Accra with anti D serum.

Group	Number observed and percentage Incidence			
	Lagos		Accra	
O	560	(56%)	851	(55%)
A	207	(21%)	338	(22%)
B	203	(20%)	316	(21%)
AB	30	(3%)	35	(2%)
D-	40	(4%)	50	(6%)
D+	960	(96%)	755	(94%)

The figures show remarkably close agreement. The slightly higher incidence of rhesus negative individuals in Accra could be explained by the occasional selected rhesus negative family examined.

(2) *Blood Transfusion Service*

The blood bank has continued to function reasonably successfully during the year. This has only been made possible by the invaluable assistance given by the British Red Cross Society, by Mrs. Cook (a voluntary worker), and by the Specialist Anaesthetist who has been responsible for the numerous venesections. There are now 845 registered donors, and 335 pints of blood have been stored and transfused. The organisation still leaves much to be desired; the clinicians are demanding more blood as it becomes available and expansion and re-organisation of the blood transfusion service will have to be envisaged in the future.

The incidence of transfusion reactions cannot be given accurately because the transfusion record cards issued with each bottle of blood have, in many instances, not been returned to the Institute by the Medical Officer concerned. Mild transfusion reactions were reported from the Maternity Hospital, Accra, during two periods in 1954 and were found to be due to inadequate cleaning of the giving apparatus in one instance and in the second to inadequate cleaning of the blood transfusion bottles with distilled water. One severe reaction was reported and a staphylococcus was isolated from the blood remaining in the bottle. No deaths have occurred as the result of transfusion and no cross-matching accidents have occurred.

The supply of rhesus (anti-D) grouping serum is limited and this has of necessity restricted the amount of work undertaken. Routine grouping of all antenatal patients cannot at present be done. This is not, however, as grave a problem as it would be in the United Kingdom as the incidence of rhesus negative women in Accra is low. No proven case of haemolytic disease of the newborn due to rhesus or A.B.O. incompatibility has yet been reported in the Gold Coast, although a case of kernicterus was seen this year at necropsy. Cases must occur, and it can be only a matter of time until they are reported.

(3) *The Abnormal Haemoglobins*

The discovery of haemoglobin C in the Gold Coast (Edington and Lehmann, 1954 *a* and *b*) and of haemoglobin G (Edington and Lehmann, 1954 *c*) has raised many new haematological and pathological problems. Approximately three per cent of the population in the Accra district of the Gold Coast should suffer from one or other of the following diseases:—

Sickle-cell anaemia, sickle-cell haemoglobin C disease or homozygous haemoglobin C disease.

It is not yet known if haemoglobin G causes morbidity.

(4) *Radioactive Strontium in Monkeys*

Work has continued on this problem in conjunction with the Physics and Zoology Departments of the University College, Gold Coast. A full report of the findings, including haematology and morbid anatomy, in the 13 animals who died following the injection of varying high dosages has been forwarded to the Atomic Energy Research Unit of the Medical Research Council, Harwell.

A preliminary communication on the effects of lower dosages in the Monkey has been accepted for publication in *Nature*.

(5) *Sickling and Malaria*

In conjunction with the Medical Officer in charge of the Malaria Investigation 664 children and 48 babies were examined for the presence of the sickle-cell trait, and malarial parasite counts were performed. It could not be shown statistically that the trait protected against infection by the malarial parasite. It was felt, however, that the figures tended to show that among children with the trait the number infected by *P. falciparum*, and the degree of infestation, are both slightly less than in those with normal erythrocytes. It was not felt that the trait protected the bearer from infestation by *P. malariae*.

(6) *Haemosiderosis and Anaemia*

Work on this subject has been confined to the autopsy material and no clinical investigations have been undertaken.

(f) *Pathology Division*(1) *General*

Material from 467 necropsies have been dealt with, and 724 specimens have been received from out-stations. The range of staining techniques has been extended and the amount of work performed in the department has more than doubled. It has been possible from a study of the necropsy protocols and blocks of tissue field in the Institute to describe certain aspects of the pathology of cardiovascular disease, cerebral malaria and sickle-cell disease in the Gold Coast (Edington, 1954, *a, b, c*). It should be emphasised that there is much valuable pathological material filed in the Institute and only the shortage of technical staff prevents its much wider use as research material.

(2) *Post-mortem Examinations*

467 necropsies were performed during the year as against 425 in 1953 and the causes of death in 437 cases are shown in Appendix "F".

Necropsies were performed on 24 babies under the age of seven days. In seven instances it was impossible to determine the cause of death. Only one baby died of haemorrhagic disease of the newborn—a considerable fall in incidence, but whether this is due to improved treatment or to selection of material cannot be decided. It is of interest to note that one child showed kernicterus, and fatty necrosis of the liver was thought to be the cause of death in one other case.

(3) *Diseases of the Cardiovascular system (44).*

These followed the pattern described in "Cardiovascular Disease as a cause of Death in the Gold Coast African" (Edington, 1954). Endomyocardial fibrosis, although carefully searched for, was only found once; the case was that of a male aged 30 years in whom there was a coincident (or perhaps causal) *strep. faecalis* endocarditis. An editorial in the British Medical Journal (1954) stated "There can be little doubt that endocardial fibrosis is a common cause of cardiac failure in Africa and the Middle East". In addition to the case reported by Macfie (1915) only seven other examples of this condition have been reported in the Gold Coast since 1921 (Edington, 1954). It must therefore be stated that endomyocardial fibrosis is an uncommon finding in autopsy material in the Gold Coast. It is possible that patients suffering from endomyocardial fibrosis do not come to post-mortem (Hawe, 1954) but as minor degrees of the condition have not been noted in material in Accra it is unlikely that the condition can be generally common. The aetiology of endomyocardial fibrosis is obscure. Numerous factors have been considered including malnutrition, infection, syphilis, yaws, a parasitic infestation, a collagen disorder, anoxia of the heart in children and a congenital basis. Malnutrition and treponematoses are common in the Gold Coast and can therefore be excluded as possible aetiological agents in this locally rare condition. It is more difficult to exclude the other possible factors, but the finding of 40 West African soldiers in the Middle East suffering from endomyocardial fibrosis (Bedford and Konstam, 1946) and its apparent rarity in the Gold Coast is possible evidence in favour of an infective agent.

(4) *Diseases of the Respiratory System (52).*

Carcinoma of the lung is rarely seen at autopsy, and the occurrence of a squamous celled pulmonary carcinoma in an African female aged 50 years is of interest. Tuberculosis is once again one of the most frequent causes of death.

(5) *Diseases of the Central Nervous System (33).*

Cerebral malaria was the cause of death in two boys aged two and two and half years and one girl aged one and half years. The children were well nourished and in one the peripheral blood was free of parasites although numerous ring haemorrhages were present in the brain. *Salmonella typhimurium* and *salm. virchow* were isolated from the mesenteric glands of one boy and one girl respectively with no visible changes in the intestine itself. The findings in the autopsies were similar to those already described (Edington, 1954) apart from the presence of the salmonella infection. The significance of the presence of these organisms is difficult to assess as they have been isolated from the mesenteric glands of children killed in accidents (Hughes, 1954) and the histopathology of the organs does not reveal the presence of typhoid like lesions. Encephalitis was the cause of death in nine subjects, all of whom had died suddenly and had been subjected to no antemortem investigations. The diagnosis of encephalitis at necropsy without clinical data is not easy and can only be confirmed by histological methods or animal inoculation. Unfortunately in these cases portions of brain were preserved in formol saline only and the aetiology of the condition must remain speculative. Three deaths occurred from Rabies.

(6) *Diseases of the Liver (17)*

Cirrhosis of the liver is given as the cause of death in four necropsies—one of the cases being a six weeks old baby girl with marked hepatitis and cirrhosis. The incidence of cirrhosis as a cause of death cannot be taken as the general incidence of cirrhosis in the Gold Coast. Of the 11 subjects who died of hepatitis no fewer than seven were pregnant women in whom the histopathological appearances of the liver were those of acute or subacute massive necrosis, suggesting a nutritional factor in the aetiology of the condition.

(7) *Diseases of the Gastrointestinal Tract (26).*

It is of interest to note the occurrence of appendicitis and intestinal perforation. Schistosomiasis was the cause of appendicitis in one necropsy and a perforated peptic ulcer was found in three. The remaining two perforations were due to non-specific ulcers in the jejunum and ileum respectively. Volvulus and strangulated herniae continue to be the most causes of intestinal obstruction.

(8) *Infections and Parasitic Diseases* (39)

It is regrettable to find that typhoid fever was once again a common cause of death.

(9) *Miscellaneous Diseases* (64)

Malnutrition includes various deficiency states in children and starvation in the elderly. Four children were considered to be suffering from Kwashiorkor. The diagnosis of Kwashiorkor at autopsy is not an easy task as a grossly fatty liver and atrophy of the pancreas may be found in children suffering from various other conditions—the most important being chronic malaria, tuberculosis, and gastroenteritis. The part played in the cause of death by the various conditions found, including protein deficiency, is difficult to assess. Kwashiorkor has only been given as the cause of death when it was considered to be the primary condition.

The sickle-cell crisis has been given as the cause of death in thirteen necropsies. The pathology of this condition was discussed at the International Blood Transfusion Congress in Paris (Edington, 1954). It is hoped that during the next year it will be possible to describe the pathology of some of the various abnormal haemoglobin diseases.

Leukaemia was the cause of death in three autopsies and lymphadenoma in two.

(10) *Histopathology*

Sections were prepared from the brains of 31 dogs, three cats and three humans suspected to have been suffering from rabies. Negri bodies were not demonstrable in any of the human material although diagnosis of rabies was confirmed by mouse inoculation. Rabies was also diagnosed by mouse inoculation only in two cats. Of the 31 dog brains examined histologically 12 were considered negative, 13 were reported as suspicious and six Negri bodies were detected. The diagnosis of rabies by histological methods alone therefore is a most unsatisfactory procedure. This is discussed more fully in the bacteriological section.

In the biopsy material *mycosis fungoides* was diagnosed for the first time in the Gold Coast (Ashworth and Edington, 1954). In addition a biopsy specimen sent from an outstation revealed the characteristic histopathology of *Histoplasma duboisii* Vanbreusghem.

(11) *Tumour Pathology*

Two hundred and eighteen tumours were sectioned and 93 of these were considered to be simple. Fibromata and fibromyomata accounted for 30 of these simple tumours. In the remaining 63 the most common types were thyroid disease (9), angiomas (6), neurofibromata (6), papillomata (6), dermoid cysts (6), prostatic hypertrophy (6), fibroadenosis of breast (5), naevi (4) and giant cell tumour of tendon sheath (2). Tumours of the brain are rarely encountered at post-mortem in the Gold Coast and one meningioma was seen this year.

One hundred and twenty-five tumours were considered to be malignant. The various types diagnosed are listed below:—

Carcinoma	..	..	..	..	..	..	..	73
Sarcoma	..	..	..	..	..	..	..	13
Reticuloses	..	..	..	..	..	..	..	7
Melanoma	..	..	..	..	..	..	..	7
Adamantinoma	..	..	..	..	..	..	..	4
Retinoblastoma	..	..	..	..	..	..	..	3
Chorionepithelioma	..	..	..	..	..	..	..	3
Ovarian tumours	..	..	..	..	..	..	..	5
Mixed salivary	..	..	..	..	..	..	..	2
Endothelioma	..	..	..	..	..	..	..	2
Dermoid	..	..	..	..	..	..	..	1
Unclassified	..	..	..	..	..	..	..	5

The 73 carcinomatous tumours included 21 epitheliomata, six of which arose from ulcers on the limbs. The other most common sites were the neck (3), conjunctiva (2), and penis (2). The remaining 52 carcinomata were distributed as follows:—breast (8), cervix (8), stomach (10), uterus (6), bladder (3), liver (3), ovary (3), thyroid (3), intestine (3), pancreas (2), unclassified (2), and prostate (1). The increase in carcinoma of the stomach (adenocarcinoma) is due to the increased number of surgeons interested in abdominal surgery and would suggest that this type of cancer is at least as common as it is in Europe. In no instance were ova of *S. haematobium* implicated in the aetiology of the condition. The tumours occurred in six females and four males whose ages ranged from 45 to 60 years. In two instances chronic ulceration appeared to be a predisposing factor.

(ii) GOVERNMENT CHEMICAL LABORATORY

The services of the Government Chemical Laboratory were available for only six months in the year, as there was no relief to take over the duties of the Government Chemist during his absence on leave.

As in 1953, the work carried out at the Laboratory during the six months it functioned covered a very wide field, about 50 per cent being done on behalf of the Criminal Investigation Department, about 30 per cent for the Comptroller of Customs and Excise and the Ministry of Health, and the remainder largely for other Government departments including the Departments of Agriculture, Animal Health, Education and Posts and Telecommunications. In addition a small amount of work was done for the Royal Army Service Corps Depot, Accra, and for a number of commercial undertakings.

(a) *Police Work*

The Police work included a large proportion of toxicological examinations and amongst the poisons detected in some of these cases were: Arsenic, Bismuth, Copper, Hydrocyanic acid, Zinc, Cresol, Erythrophleine, Rauwolfia alkaloids, Strophanthin, Thevetin and an unidentified glycoside from a poisonous variety of wild yam. 12 cases of Indian Hemp were dealt with in 1954 during the six months in which the laboratory was open, and concerned 23 exhibits. Apart from visual inspection, examination consisted of chemical tests on extracted resin and microscopic examination of the specimens: in addition, all specimens were weighed. The following are official figures from the Criminal Investigation Department and cover the period 1951-1954 inclusive.

Year	INDIAN HEMP		
	No. of cases reported	No. of successful prosecutions	Persons convicted
1951	61	43	43
1952	118	79	87
1953	140	95	103
1954*	130	100	100

* Approximations—final figures not known.

It should be noted that exhibits are submitted for tests in police cases only where a suspect pleads "not guilty": little progress seems to have been made in controlling the propagation of Indian Hemp, which may well prove to be a serious social problem in the Gold Coast.

On a number of occasions the Government Chemist was called as an expert witness to give evidence in Court at Accra, Kumasi and Dunkwa.

(b) *Customs Work*

Analyses for the Comptroller of Customs were carried out on samples of beers, wines, spirits, textiles, foodstuffs, and a variety of other articles. In one instance concerning a form of biscuit which enjoys a lower import rate than sweetened biscuits, the results were challenged by a firm of exporters in England who employed the services of a firm of consulting chemists to support their case. Such biscuits, to enjoy the lower import rate, must contain not more than 5 per cent of added sugar. The samples challenged were found to contain approximately 10 per cent of sucrose. The results obtained in Accra were confirmed by the Government Laboratories in London, and clearly indicated that the manufacturers had not employed certain commercial syrups in making the biscuits, that about 2 per cent of maltose was produced in their preparation, and that the method of analysis employed in the Accra Laboratory was satisfactory.

(c) *Cocoa Fermentation*

In November the Government Chemist was invited to witness some experiments on the fermentation of cocoa beans being carried out at Bekwai by a research chemist in the employ of Messrs. Cadbury and Fry Limited. Cocoa fermentation studies have been necessitated by the number of new varieties of cocoa trees made available within recent years by botanists; the chocolate manufacturers found it necessary to discover a method of assessing the quality of the new kinds of beans economically, and this is being done by fermenting very small amounts of them. The Bekwai experiments were the outcome of laboratory studies in England; as a result of them several matters came to light the importance of which had not been previously recognised. These concern the germination process in the beans during the first stage of fermentation; the necessity for maintaining the beans at a temperature of about 50°C for several days after the initial period of fermentation, and the observation that the beans themselves as well as the surrounding pulp produce large amounts of carbon dioxide in the early period of fermentation. Other fundamental studies on the subject of cocoa fermentation are being pursued by the Research Chemist at Bekwai, whose experiments may eventually lead to the replacement of existing methods of fermentation in the Gold Coast by scientifically controlled processes in a number of cocoa growing areas (R. V. WADSWORTH and G. R. HOWAT; *Nature* Vol. 174, p. 392 28th August, 1954).

(d) *Poisons*

Apart from the commonly-occurring cases of poisoning by injection of organic arsenic and bismuth compounds, two unusual cases came to notice during 1954. The first concerned a man who died as a result of drinking a trade spirit extract of roots identified as *Rauwolfia Vomitoria* that had been given to him mixed with innocuous herbs to cure a chest complaint. A good deal of attention was being given during the year to alkaloids obtained from *Rauwolfia* species which are considered to have a medicinal value in cases of hypertension. The other case concerned the deaths of several people in the Bekwai district through eating a poisonous wild yam. The poisonous principle in these yams is a glycoside and is probably closely related to Dioscorein found in poisonous yams in Jamaica. The only previously recorded case of poisoning by wild yam in the Gold Coast that is known was that noted by the Government Chemist in 1946 from the Tafo area.

Several members of the staff of the University College of the Gold Coast rendered valued assistance during the course of the year; in particular Professor Boughey, Mr. Adams, and Mr. Akpabla of the Botany Department who have identified a number of specimens, and Mr. Stephens of the Chemistry Department who, by the courtesy of Professor Graham, greatly helped in the maintenance and repair of a number of laboratory instruments.

In December a lady Government Chemist was appointed and assumed duty. This will greatly improve the service available and will enable the laboratory to remain open all the year; in the past it has been closed whilst the Government Chemist was on leave.

CHAPTER VIII

RESEARCH INTO MALARIA CONTROL

(i) INVESTIGATION INTO THE DEGREE OF MALARIA INFECTION

As the result of surveys carried out in the past two years it has been possible to classify the Gold Coast into areas of malaria endemicity. It is not easy to give a simple definition of the amount of malaria in these areas but it is quite simple to describe them in general terms.

First, in the *forest* areas, which have a high rainfall distributed fairly evenly through the year, each individual receives a large number of infected bites; transmission of malaria takes place even in the drier months. The whole population is infected during the first year of life. Malaria surveys reveal parasite rates rising to about 90 per cent at the end of the first year, remaining at this level during childhood and then falling to about 15 per cent by the age of 20 years. The spleen rate also rises to a high figure in early childhood and falls to a low level in adult life. There is little seasonal variation in either rate. This area has not been exactly defined but it can be considered to be about the same as that in which cocoa grows. This picture of malaria infection has been found at Bomfa in Ashanti; it is similar to that which was found at Ilaro in Nigeria before the control scheme was started.

Secondly, the *coastal plain* has a lower rainfall with several dry months in the year. In this area the major part of the population is infected in the first year of life and at the end of the rainy season the spleen and parasite rates are similar to those found all the year round in the forest area. At the end of the dry season they differ from those found in the forest area; there has been no transmission for several months, and the parasite rates are distinctly lower, rising to a peak of about 65 per cent in the two to three-year old age group; the spleen rates are also lower. This type of malaria is found south of the forest. It may be found north of the forest as the rainfall conditions are similar. A survey to check this and to provide entomological data is in progress at Bolgatanga. A full description of this degree of malaria infection is given in the report on malaria in the suburbs of Accra.

In the *third* or *urban* area there is much less transmission and a considerable proportion of infants pass through the first year of life without becoming infected. After the rains the parasite rate reaches about 45 per cent in five-year olds and then falls to a low level in adults; the spleen rate is even lower. At the end of the dry season the parasite rate does not exceed 30 per cent at any age. This malaria picture has been found in the centre of Accra; it is not known whether it occurs in the centre of the other big towns but it is considered improbable. A similar picture was found at Freetown and at Ilaro after control.

The areas are not clearly defined and intermediate zones must occur. The important question of the effect of movement of population is considered later.

(ii) ANOPHELINE DENSITIES RESPONSIBLE

Probably the most readily understandable figure to describe the anopheline density is the number of infected bites per person each year. Technical difficulties make an accurate calculation of this figure difficult but if surveys are made using the same methods in different areas useful figures for comparison are obtained. Such surveys produced the following figures:—

- About 25 infected bites per year at Bomfa in the forest;
- About 20 in the suburbs of Accra;
- Less than 1 in the centre of Accra;
- About 2 in the intermediate areas of Accra.

(For the sake of comparison more than 100 infected bites per year have been reported from Tanganyika). The figures for the Northern Territories are not yet available.

In the forest area of the Gold Coast very high parasite rates are caused by a large number of infected bites spread evenly through the year. In the coastal plain and probably the Northern Territories, rates are very high at the end of the rains with a seasonal remission during the dry season. The number of infected bites is high.

In Central Accra, where the number of infected bites is low, there is a lower parasite rate reaching a peak at a later age than in the other areas.

An attempt will now be made to correlate the malariometric and entomological figures given above with the degree of disability caused by the disease to the individual.

(iii) MORTALITY AND MORBIDITY CAUSED BY MALARIA

The estimation of the mortality and morbidity caused by malaria is extremely difficult in a country where young children suffer from many diseases at the same time and where medical records are scanty and unreliable.

The following is the evidence from which the conclusions given in this report are drawn:—

- (1) The results of the Ilaro scheme in Nigeria;
- (2) Published work on Malaria mortality, by Dr. Bruce-Chwatt in Lagos and Dr. Edington and Dr. Colbourne in Accra;

(3) The effect of treatment with suppressive drugs carried out by Dr. Colbourne and Dr. Wilson. The coincidence that the parasite rates and anopheline densities in Ilaro before control and in suburban Accra at the end of the rains were similar to those found in Central Accra has helped to confirm figures derived independently from the two countries.

It seems certain that deaths due to malaria in West Africa are practically confined to the first five years of life. It is known that in the areas where there is a heavy infection with malaria in the first year of life the infant mortality rate is very high the figure often exceeding 200. In Central Accra with its low malaria infection rate in the first year of life and in Ilaro after control, the Infant Mortality rate was less than 100. Malaria deaths continue to occur in all areas from the age of twelve months up to the age of five years but it is considered that in Central Accra they are at a higher rate than in the areas where practically every infant is infected during the first year of life. It was also noted that in Central Accra there were more deaths registered as due to malaria in children over 5 years than in the suburbs.

Consideration of the figures collected in the Gold Coast and Nigeria suggest that of every 1,000 infants born about 50 die because of malaria before reaching the age of five and that in Central Accra there were more deaths due to malaria in older children but less in infants. The figures cannot be considered accurate enough to assess what benefit, if any, the lower infection rate in Central Accra has produced, on account of the difficulty of assessing the part played by malaria in causing death in infancy.

It can scarcely be doubted that the elimination of malaria from the Gold Coast would prevent at least 4,000 deaths of children below the age of five every year; this figure assumes only 25 deaths per 1,000 infants born; it is possible that it would be much higher.

With regard to the morbidity caused by malaria, Bruce-Chwatt has shown that about 25 per cent of infants in Lagos are seriously affected by their first attack of malaria. No similar estimation could be made in fifty infants followed for six months in the outskirts of Accra, as treatment was given as soon as symptoms appeared, but it was considered that two of the 22 infants that became infected with malaria would probably have died if they had not been treated. In the others the first attack of malaria was accompanied by symptoms of varying severity.

With regard to older children it is considered that seven year olds in Accra suffer about five days sickness a year and that those from the more malarious suburbs may, on account of an earlier development of immunity, suffer less than those from the centre.

Adolescents at Achimota and adults probably suffer on an average, one or two days sickness a year.

No figures are available for the important age group over one year old and under seven but clinicians consider that malaria is an important factor in the unhealthiness of this group.

To summarise, malaria probably causes about fifty deaths in every 1,000 children born; there are few deaths over the age of five; the more intense the malariousness of the locality the earlier death occurs; partial control may cause a considerable decrease in infant deaths, but appears to increase the death rate in older children.

Morbidity is considerable under the age of five; over that age it decreases as the child becomes older and by adult life it appears comparable to that produced by the common cold in Europe. There is again some evidence that in the less malarious urban areas severe morbidity starts later and lasts longer.

It is considered that these figures give a good general idea of the disability caused by the disease. The effect of control will provide the most useful yardstick, but only if reliable presented figures are available.

(iv) THE RELATION OF THE RESULTS OF THE MALARIA INVESTIGATION TO THE PROBLEM OF CONTROL

It has been shown that malaria causes considerable mortality and morbidity in the Gold Coast. It is obvious that if there were no infected mosquitoes these disabilities would vanish; it does not follow that they will be reduced in proportion to the reduction of infected bites.

Anti-mosquito measures that do not reduce the number of infected anopheline bites per year are clearly useless; measures that reduce the number of infected bites, but not sufficiently to affect the parasite rate are equally useless. The critical figure was considered by Turner and Walton in Freetown to be about two or three infected bites a year; local surveys suggest that the same figure applies to Accra. It must regretfully be concluded that almost all the antimalarial measures at present in use in the Gold Coast fall into the above two categories.

The third category, that in which the reduction of infected bites has caused a reduction in the parasite rate, as in Central Accra, produces more controversial results. When the number has been reduced to such a low level that malaria attacks are very rare the community has obviously benefited; when there are still sufficient infections to cause a lower infant mortality rate but a considerable mortality in later childhood and increased morbidity in adults the benefits are much less clear; it could be argued that the community has suffered rather than benefited. The death of an older child is more disastrous to a family than that of an infant. A school child or adult who becomes liable to disabling attacks of malaria has gained no benefit. It is not proposed to make pronouncements on the morality of this difficult question nor to put forward these possibilities as arguments against an attack on a disease which clearly causes great disability in the Gold Coast, but it is necessary to point out the probable results of incomplete or unconsidered schemes. It has been shown that these trends are already appearing in Central Accra, where various factors have reduced the number of infected bites to a low level.

At this point it is necessary to consider two other matters which have a bearing on the subject and which, to some extent, explain why the brilliant effects achieved in malaria control elsewhere have been less successful in many parts of Africa.

The first factor is the movement of population. In most parts of the world, where antimalarial measures have been successful, attack has been made on the areas where the incidence of the disease is highest, so that movement in and out of the controlled area is of little significance; in West Africa any effective control scheme can only form an island in the middle of a sea of highly endemic malaria. Trips to and from the uncontrolled area may result in the individual suffering the few infected bites needed to counteract the benefit achieved by control.

There is no doubt that travelling is a national habit in the Gold Coast. In Accra about half the children have spent some time in the country-side before they have reached the age of seven. Many may be said to have two homes, one in the town and one in the village.

In addition to its effect on control, travelling tends to affect parasite rates, so that they do not give a true picture of malaria transmission in the area in which they are collected. The rates in areas of low transmission are raised and in those of high transmission are lowered. In assessing transmission from parasite rates, only very young children who have not left the locality in which they were born should be examined. Out of 55 infants in the suburbs of Accra followed up from birth, 16 were absent from Accra for varying periods before they were six months old.

The second factor that must be considered as having a bearing on the problem of West African malaria is that of inherited immunity. This immunity is well recognised in West Africa and elsewhere; it is the reason why adults suffer from malaria less severely than young children. Inherited immunity has been said to be produced by residence in a highly malarious country for many generations. The aborigines of the Terai in India are less susceptible than Aryan immigrants even though the latter have been in the Terai for several generations. It has been shown in the United States that those of African stock are less susceptible to malaria than Caucasians. It is suggested that those of mixed African and Caucasian parentage in West Africa are more susceptible to malaria than those of purely African stock—a subject into which an investigation is planned. Another related factor is the possible protection against malaria afforded by the sickle-cell trait. These factors are mentioned at this point to suggest reasons why successful control may achieve less spectacular success in West Africa where a certain stability has been achieved, although the cost in death and disease is still considerable.

The conclusions to be drawn are that antimalarial schemes must be extremely efficient to have any effect at all. So-called antimalarial schemes are sailing under false colours if they do not reduce the ill health of the people caused by malaria. There is no doubt that the control, partial or complete, of nuisance mosquitoes and amenity drainage are laudable public health projects in themselves. It has, however, been shown that a very high degree of anopheline control is necessary in West Africa to reduce disability from malaria; there is no reason to suppose that this will be achieved by general public health measures. To use the word "antimalarial" with reference to such measures is confusing and obscures the real problem. The result is that little is achieved. It is thought that the present schemes have no effect on malaria and also, in many parts of Accra, nuisance mosquitoes flourish.

It should also be noted that control of anophelines sufficient to abolish malaria will not necessarily get rid of the nuisance mosquitoes whose habits are so different. As the nuisance mosquitoes are the ones that are noticed by the general public this possibility should be pointed out before a scheme is started, otherwise disappointment with the apparent failure of the scheme may cause its abandonment after a few years, with disastrous effect on the children who have been living in the controlled area.

Observations on students returning to the Gold Coast after several years in the United Kingdom suggest that adults would also lose some of their acquired immunity by being unexposed to infection for several years, but that the attack would easily be controlled by antimalarial drugs. It is also relevant to note that the transfer of Government Officers, who have never left the Gold Coast, from one station to another is often followed by sharp attacks of malaria; this may be due partly to infection with a strain to which immunity has not been developed and partly to movement from an area of low endemicity to one where it is higher. The problem requires investigation.

To summarise, in order to reduce malaria in West Africa a very high degree of anopheline control is necessary. To avoid the effect of population movement a large scheme is more likely to succeed than a small one. Owing to the narrow margin of anopheline control between success and failure,—of which the only true yardstick is the health of the population—a constant check must be kept on entomological data, malariometric rates and vital statistics. Other important factors are the development of immunity and the relation between malaria control and mosquito control.

(v) POSSIBLE METHODS OF MALARIA CONTROL

It has been shown that a very high degree of anopheline control will be necessary to eradicate malaria. Control just short of eradication will probably reduce infant mortality but may well increase mortality and morbidity in older children. Control that permits one or more infected bites a year will have very little effect at all.

In this section consideration will be given to the various methods whereby control may be achieved. These are destruction of adult mosquitoes, prevention of breeding by drains and larviciding, the use of suppressive drugs and personal protection against the bites of mosquitoes.

The last method of personal protection is mentioned only to be dismissed; however valuable it may be for the defence of the expatriate with his different malaria problem and however useful as an addition to other measures it cannot by itself be sufficiently effective to produce any effect on the malaria incidence in the general population.

In the same way, although suppressives form the sheet anchor of the expatriates' protection from malaria, it is felt that they can play little part in general malaria control in the Gold Coast. Experience in the army and with expatriates in the Gold Coast suggests that, even in disciplined and apparently well-educated groups, regular use of suppressives is difficult to achieve. These drugs may play a part in the

protection of particular groups and it may be possible, in the light of further experience, to recommend their use in schools. They may also be recommended to individuals who are prepared to use them regularly and who understand the risk of severe malaria after an interruption of suppression.

The control of breeding by drainage and larviciding has been the back-bone of malaria control in the Gold Coast for many years. With regard to rural areas in West Africa, it is now almost generally agreed to be quite inconceivable that present methods of larval control can possibly have any significant effect on malaria. The area round each village to be controlled is too large for the manpower of the village and in many cases extensive clearing would be required which would remove the vegetation on which the economy of the village depends.

In urban areas the value of drainage and larviciding needs further consideration. By these methods anophelines have been largely removed from Freetown and the parasite rates reduced to a very low level, although it is not easy to discover whether there has been much effect on the morbidity and mortality from malaria. Walton suggested that as a result of control infant mortality had been reduced but a more severe disease was being observed in adults. Movement of population also tended to limit the effects of control.

In central Accra, although it has been shown that there has been a lowering of the parasite rate it has not been possible to demonstrate any overall reduction in mortality; there is a suggestion that morbidity is extending to the older children. Certainly no other methods than control of breeding have been used in Accra. It is considered that the small number of anophelines in Central Accra is due more to its situation on the sea, its relatively well built-up streets and to the dirty state of the seaward end of the Korle Lagoon, which favours culicine rather than anopheline breeding, than to specific antimalarial measures. It must be noted that in 1946 larviciding was recommended by Dr. Bruce Wilson as the control method of choice in Accra and Takoradi. It is not thought that the same advice would be given today, residual insecticides having achieved such a notable success.

Extensive drainage schemes together with other control measures were carried out in both these towns during the war. Although it was hoped that they would also help the civilian population these measures were mainly for the benefit of the armed forces. As far as can be discovered from the records available for Accra, they produced a marked reduction in mosquito breeding of all types, a slight, but not striking reduction in the parasite rates in Nima near Accra Airport, and no definite reduction in the civilian mortality from malaria, although the figures available on the subject are equivocal.

In assessing the possibility of larval control in Accra it is necessary to consider the various types of breeding grounds found by the Medical Entomologist. First the Lagoons and the system of drains leading into them; this is an engineering problem that appears to require solution from the point of view of general drainage and improvement of amenities as well as from that of malaria control. It is understood that expert advice is to be sought on this drainage problem; it should be remembered that at the moment the channels leading into the Lagoon are equally or more important than the Lagoon itself as sites of anopheline breeding. Earth drains on the Accra plains rapidly become potential or actual breeding grounds, and larviciding as well as drainage might well be necessary.

Secondly, the general street drains of Accra and the larger excavations may be classed together as a type of breeding ground that could be controlled by local drainage or by regular larviciding with adequate supervision; this would need an organisation similar to that operating in Freetown. Known seepages could probably be dealt with by similar methods.

The third type of breeding place consists of the innumerable puddles and waterlogged footprints which appear in Accra during the rains; these are found mainly in the suburbs but extend also into the town wherever active building development is in progress; to control these breeding places by larviciding would also require a system of daily tasks by the type of organisation established in Freetown. One of the difficulties would be that this large body of men would have to be kept employed but inactive for much of the year, ready to move into action in their own well known section a few days after rain had fallen, which may occur in practically any month in Accra.

Control in Accra by these measures would involve the setting up of a large and expensive system on the Freetown model. Its techniques would be useful only in Accra and, possibly, the other large towns. Due to greater seasonal differences and to the flatness of the terrain, it might be less successful than in Freetown, where, it has been noted, complete control has not been achieved, and it would also suffer from the disadvantage that it could not be extended into the rural areas.

The final method of malaria control to be considered is the use of residual insecticides. This is the method which has achieved striking success elsewhere in the world. It can be said that it is the only method at present known that offers any hope of control in the rural areas of West Africa. It can also be said that so far no satisfactory scheme for use in West Africa has been achieved, although several promising tests have been carried out.

Calculations from Tanganyika by Davison and Draper where the density of anophelines is greater than in West Africa, show that, in theory, reduction of anophelines sufficient to control malaria can be produced by residual insecticides. This could be achieved by frequent application of B.H.C., probably by infrequent applications of dieldrin but only with difficulty using D.D.T. They also point out the advantage of a method which reduces the average life of the mosquito. Those that escape larviciding have the average life span; it is the elderly mosquito that is the main malaria transmitter.

The situation in Accra needs special consideration. It has been suggested that it might be possible to achieve control by a protective belt of residual spraying round the outskirts of the town as has been done in Georgetown. The results of a Lagoonside survey suggest that this would not be effective in Accra. It is possible, even likely, that residual insecticides will not control the breeding of nuisance mosquitoes; it is probable that efficient larviciding would. It is, however, considered that, in the first place, a method should

be tried that is applicable to the country as a whole and not only to the large towns. If this recommendation is accepted the problem remains of the construction of a satisfactory system of drainage in Accra; this must include the whole lagoon system and the areas in which building is actively in progress. It is suggested that this must be achieved by permanent works and not by small scale local measures such as the haphazard application of larvicides and the making of earth drains, both of which are inefficient and entail considerable recurrent expenditure. Although it is to be expected that residual insecticides alone will control malaria, a successful drainage scheme will improve its chances of success in addition to the other obvious benefits it will afford in the field of public health.

The use of residual insecticides appears to offer the best hope of malarial control both in urban and rural areas. It must be stressed that such a scheme needs a very careful survey before it is started, both with regard to the type of insecticide to be used, method of application and organisation for checking results. The preliminary training of a large and reliable staff is essential (probably about one established officer and four technicians to each 10,000 of the population to be protected). Other important aspects are explanation of the scheme to the people and the granting of legal powers in order to prevent a few ill disposed people from wrecking it. Careful financial estimates are necessary but it can be said that such a scheme would cost in the region of 3s. to 4s. per head of the population protected per year. It has already been pointed out that on account of the factor of movement of population the larger the scheme the more likely it is to succeed.

The introduction of such a scheme into the Gold Coast should be considered as another step in the series of pilot schemes in progress throughout West Africa. It should be capable of extension to cover the whole country.

From what has been written above it is clear that it would have to be on a large scale and it would require considerable preliminary preparation, legal, social and financial. This would appear to be the next logical step in the attack on malaria in West Africa.

CHAPTER IX

SCHISTOSOMIASIS

(i) INTRODUCTION

The importance of human parasitic infections in the continent of Africa has long been evident. In the indigenous population the incidence of helminth infection is high and its distribution widespread. In particular, schistosomiasis occurs throughout vast areas of the African continent, (Amberson and Schwarz (1953) and Blair (1952).)

Ordinarily, it seems that in areas where schistosomiasis is endemic its effects are insidious rather than severe and, for this reason, the disease is often ignored by those harbouring the parasites. In the unaltered African environment there is much evidence to support the view that the relationship between the schistosome parasite and its human and snail hosts has achieved a high degree of biological balance that is satisfactory to all. However, where extensive irrigation projects have developed in conjunction with the economic progress of several African territories (e.g. Egypt, the Sudan and Southern Rhodesia) the ill effects of schistosomiasis have become dramatically apparent. It is clear that man-made alterations to the natural landscape may upset the balance of the host-parasite relationship and that the problem of schistosomiasis, like the majority of problems associated with parasitic organisms, has arisen as a result of an improper adjustment between the parasite and its hosts.

In West Africa vesicular schistosomiasis (*Schistosoma haematobium* infection) and, to a lesser extent, intestinal schistosomiasis (*Schistosoma mansoni* infection) are both endemic (*vide* GORDON, DAVEY and PEASTON, 1934 and BLAIR, 1952). However, except for a few notable exceptions, neither of the infections has yet given cause for alarm. Health personnel serving in West Africa are of the general opinion that, although schistosomiasis is of common occurrence, its effect on human health is seldom severe. It may be suggested, therefore, that the biological balance between the schistosome parasites and their hosts has reached a satisfactory stage of equilibrium in the West African environment. Nevertheless, there have been reports on foci of infection where the effects of the disease are more severe (GORDON *et al* (*loc. cit.*) and LOVETT-CAMPBELL, 1948) and these seem to indicate that, if the opportunity were provided, schistosomiasis could become as important in West Africa as it is in the irrigated areas of Egypt, Sudan and Southern Rhodesia.

In the Gold Coast there are proposals to impound the Volta River and to construct an irrigation scheme in the Accra plains. In view of these proposed developments the authorities have recognised the potential danger of schistosomiasis and the need for an immediate investigation to assess the present status of the disease and its vectors throughout the entire country including British Mandated Togoland. The Medical Biologist was appointed and arrived in the Gold Coast in January, 1952 to participate in this investigation. From January until March, 1952 Dr. ELMER G. BERRY, an American malacologist, and the medical biologist, made a wide survey of the distribution of the snail-hosts, the work being continued by the medical biologist when Dr. BERRY left the Gold Coast. Later, arrangements were made for him to join Dr. BERRY in Sierra Leone for a short period in order to take part in a molluscicide trial. He was again absent from the Gold Coast between January 21 and March 29, 1953 when a survey of the snail-hosts of schistosomiasis was conducted in the Gambia at the request of the Helminthiasis Sub-Committee of the Colonial Medical Research Committee and with the permission of the Governments of the Gold Coast and the Gambia.

The present report deals exclusively with the studies undertaken in the Gold Coast and embodies the results of observations made from January 1952 to December, 1954. It is prefaced by a brief historical account of observations pertaining to schistosomiasis made previously in the Colony.

(ii) HISTORY

Little precise information is available concerning schistosomiasis and its vectors in the Gold Coast apart from brief references which appear in the Annual Medical Reports. It is evident from these reports that the disease has been present for at least fifty-eight years. In the Report for the year 1895, the earliest available for study, there is a record that a single patient was hospitalised as the result of *Bilharzia haematobia* infection. Subsequent reports show that increasing attention was given to the disease. The urines of 337 male patients admitted to the Gold Coast Hospital, Accra (1929 Report), who were examined irrespective of the cause of admission, revealed that ten per cent of them contained ova of *S. haematobium*. Statistics indicate a slight but steady rise in succeeding years in the number of patients reporting for treatment of *S. haematobium* and *S. mansoni* infection. The apparent rise, however, is probably more closely related to the improving facilities for treatment rather than representing a true increase in the incidence of infection. The pertinent data are tabulated in Table (A).

The annual Medical Reports and Station Health Reports make clear that the incidence of infection is particularly high in certain localities, a finding which has been verified and considerably extended during the present investigation. High incidences of *S. haematobium* infection have been recorded at Akuse, Nsawam, Adeiso and Oda in the Colony (or Coastal region), and at Bawku, Navrongo and Lawra in the Northern Territories (or Northern region). The widespread, though localised, distribution of schistosomiasis was found to be, as anticipated, intimately associated with the presence of the intermediate snail-hosts.

Some experimental work on the transmission of the parasite, as well as general observations on the relative importance of the disease, was undertaken in the Gold Coast prior to the present investigation. As early as 1915, Dr. J. W. Scott Macfie (unpublished report) attempted to infect unidentified snails with the miracidia of *S. haematobium* and "one type of snail" was recorded as specially attractive to the miracidia. Observations made by Ingram (1924) were inconclusive although they pointed to *Physopsis globosa* (this snail

is either closely related to or synonymous with *Physopsis africana*) as being a vector of *S. haematobium*. Ingram reported that two out of 165 wild *P. globosa* snails were infected with furcocercous cercariae. By exposing such snails to the miracidia of *S. haematobium*, he was able to increase the rate of infection to over 50 per cent. However, as succinctly argued by GORDON *et al* (*loc. cit*), such evidence only points to but does not prove the determination of the true vectors of urinary schistosomiasis in the Gold Coast.

During the present investigation precise experimental transmission of both *S. haematobium* and *S. mansoni* through molluscan and vertebrate hosts has been achieved, EDWARDS and McCULLOUGH (1954) and McCULLOUGH (1955b).

(iii) OBSERVATIONS

(a) Distribution of the snail-hosts in the Gold Coast

In Section (1) of Appendix "G" the common fresh-water molluscs, including the potential vectors of schistosomiasis, in the Gold Coast are briefly described.

In Section (3) of Appendix "G" the distribution of the snail hosts is shown. The potential vectors of *S. haematobium*, i.e. *Physopsis africana*, *Bulinus truncatus* and *Bulinus (Pyrgophysa) forskalii*, are much more widespread and abundant than those of *S. mansoni*, i.e. *Biomphalaria pfeifferi*.* The distribution of the snail-hosts of both species of schistosome parasite is confined largely to the Coastal belt in the South of the Gold Coast and to a belt running East-West in the extreme North region of the Northern Territories. Between these two regions the occurrence of the vectors is localised to a few isolated areas in Ashanti. Tentative reasons for this distribution of the snail-hosts will be discussed later as well as its relation to the distribution and incidence of schistosomiasis.

Although large areas in the Gold Coast have been surveyed and a comprehensive picture of the distribution of the vector species has been obtained our existing knowledge of the distribution of the snail-hosts may well be extended later.

(b) Vectors of *S. haematobium* in the Gold Coast.

As shown in Section (3) of Appendix "G" the most widely distributed vector of *S. haematobium* is *physopsis africana*. An additional vector of *S. haematobium* belonging to the genus *Bulinus* occurs in the Gold Coast but is much more restricted in its distribution than *P. africana*. This snail is probably closely related to *Bulinus truncatus* and will be so designated in this report. On the surface of its shell, especially on the body whorl, there usually occur series of small, well marked axial striations. Recent laboratory and field observations have shown that this species is a natural vector of *S. haematobium*, (McCULLOUGH, 1955b).

The species *Bulinus (Pyrgophysa) forskalii* (see Section (1) of Appendix "G") occurs widely and there is some reason to suspect that it may be capable of transmitting *S. haematobium*. At Dabala and Adutor in the Tongu Confederacy, for example, a high incidence (over 70 per cent) of *S. haematobium* infection exists among the local school-children. In this area only species of *B. (P) forskalii* could be found despite a thorough search for the recognized vectors, i.e. *P. africana* and *B. truncatus*. Elsewhere in West Africa there is recent evidence to support the view that *B. (P) forskalii* or its variants, is an intermediate host. It is suspected to be a vector in Portuguese Guinea (PINTO, 1949) and at Tudun Wada near Kaduna, Northern Nigeria (World Health Organisation Technical Report Series, 1953, 65). The observations of DUKE and McCULLOUGH (1954) and McCULLOUGH and DUKE (1954) in the Gambia strongly indicate that in some areas *B. (P) forskalii* is the principal vector. These observations have been substantiated by LEROUX (1954) who succeeded in infecting laboratory-bred snails of Gambian origin and establishing the infection in mice. In the Gold Coast, however, attempts to infect laboratory-bred *B. (P) forskalii* with *S. haematobium* from infected school children living near Accra have consistently failed and as yet there is no definite evidence that this species is capable of transmitting the parasites. In any event, even if *B. (P) forskalii* is later proved to be a natural vector of *S. haematobium*, its role in the epidemiology and spread of vesicular schistosomiasis is likely to be only locally important.

(c) Vectors of *S. mansoni* in the Gold Coast

As far as can be determined at present *Biomphalaria pfeifferi* (see Section (1) of Appendix "G") is the only species transmitting *S. mansoni*. This species is most common in the Northern Territories but it also occurs in a few areas in the Western Region of the Gold Coast. However, it is much more restricted in its distribution than the vectors of *S. haematobium*. *Biomphalaria pfeifferi* has been shown to be the natural vector of *S. mansoni* in the Gold Coast as a result of controlled laboratory studies carried out at Achimota by EDWARDS and McCULLOUGH (1954).

(d) Rate of infection in snails collected in the field

S. mansoni as assessed by the emergence of furcocercous cercariae is less than 2.0 per cent, a figure which is surprisingly low but which conforms with the findings of most workers in other African territories. It must be pointed out, however, that of the several thousand snails examined, most were collected during the dry season when the rate of schistosome infection in the snails would seem to be greatest. The seasonal incidence of infection in the vectors would be a valuable study contributing to a better understanding of the epidemiology of schistosomiasis and precise investigations along such lines are recommended for the future.

* For the purpose of the present report this nomenclature of the snail species will be used until a detailed morphological study of preserved specimens from the Gold Coast can be later undertaken. Following this study it may be necessary to alter our present opinion on the taxonomy of the snail hosts.

TABLE (A)

COMPARING THE NUMBER OF PATIENTS TREATED FOR SCHISTOSOMIASIS WITH THE TOTAL NUMBER OF PATIENTS TREATED AT HOSPITALS IN THE GOLD COAST FROM 1927 TO 1953

Year	NUMBER OF PATIENTS ATTENDING HOSPITAL			NUMBER OF PATIENTS TREATED FOR SCHISTOSOMIASIS			PER CENTAGE NUMBER OF SCHISTOSOMIASIS PATIENTS				No. of Deaths from Schistosomiasis
	In-Patients	Out-Patients		Total No. of Patients	In-Patients	Out-Patients		In-Patients	Out-Patients		Total
		Male	Female			Male	Female		Male	Female	
1927	12,427	84,803	35,839	133,069	74	152	18	0.59	0.17	0.05	0.18
1928	13,208	128,934	75,098	215,240	25	182	29	0.18	0.14	0.039	0.109
1929	15,963	142,310	90,853	249,126	71	306	74	0.44	0.21	0.081	0.18
1930	18,864	154,387	97,534	270,785	117	329	92	0.62	0.21	0.09	0.19
1931	18,584	142,028	98,455	259,067	101	335	94	0.54	0.23	0.09	0.24
1932	21,226	128,621	90,209	240,056	128	318	74	0.603	0.24	0.08	0.21
1933	23,225	131,462	96,139	250,826	155	358	72	0.66	0.27	0.07	0.23
1934	22,525	141,800	91,467	255,792	120	401	127	0.53	0.28	0.13	0.25
1935	25,397	147,330	100,749	273,476	107	371	69	0.46	0.25	0.10	0.20
1936	27,081	165,940	118,190	311,211	199	584	129	0.73	0.35	0.10	0.29
1937	28,237	172,459	129,396	330,092	143	607	103	0.50	0.35	0.08	0.25
1938	27,919	174,164	121,907	323,990	185	621	160	0.66	0.35	0.13	0.29
1939	28,114	171,917	122,422	322,453	154	659	120	0.54	0.38	0.12	0.28
1940	28,076	182,833	132,284	343,193	165	945	163	0.58	0.54	0.12	0.37
1941	32,408	209,569	153,559	395,536	171	678	153	0.52	0.32	0.09	0.25
1942	31,126	198,887	171,348	401,361	156	773	251	0.54	0.38	0.15	0.29
1943	32,873	247,754	213,828	494,455	138	739	193	0.42	0.29	0.09	0.21
1944	33,871	258,872	207,965	500,108	178	817	251	0.52	0.31	0.12	0.24
1945	37,107	277,730	216,232	531,069	123	1,246	276	0.33	0.45	0.12	0.30
1946	38,128	286,412	189,159	513,899	229	1,447	417	0.60	0.50	0.22	0.40
1947	43,483	327,040	243,240	613,763	344	2,019	725	0.79	0.61	0.29	0.51
1948	60,796	401,946	333,637	796,379	587	3,270	1,417	0.96	0.81	0.42	0.67
1949	59,042	439,455	338,494	836,991	408	3,264	1,740	0.69	0.74	0.51	0.64
1950	60,766	431,288	315,943	807,997	616	3,669	1,299	1.01	0.85	0.41	0.69
1951	68,854	443,535	295,051	707,440	584	3,219	1,014	0.80	0.72	0.34	0.68
1952	62,586	565,460	410,741	1,038,787	241	3,987	1,601	0.38	0.70	0.38	0.55
1953	66,124	468,472	300,862	835,458	430	3,165	1,361	0.65	0.69	0.45	0.59

(e) *Observations on the Biology of the Vectors*

A knowledge of the biology of the snail-hosts is necessary if their control is proposed. Some observations were made on the types of freshwater habitats, factors influencing snail survival, dispersal of the snail-hosts and their seasonal density.

Available Fresh-water Habitats

As the distribution of the vectors in the Gold Coast was recorded (Section (3) of Appendix "G"), observations were made on the fresh-water habitats. A simple classification of these habitats may be out-lined as follows:—

Habitats in Flowing Water

(a) *Temporary Streams and Shallow Drainage Ditches*.—Water is contained in this type of habitat only intermittently during the wet season and because they are dry for as long as nine or ten months of each year, they are not suitable for the survival of any of the species of snail-hosts.

(b) *Rainy Season Streams*.—These contain water throughout the wet season and do not dry up until a few months after the rains have ceased. The streams themselves seldom harbour the snail vectors with the exception of *B. (P.) forskalii* which appear to be able to withstand long periods of desiccation. Often in the beds of such streams there are depressions, due to erosion during the floods, in which water may remain for 10 or more months per year, and the pools so formed are often colonised by the vectors. Such streams are usually confined to the Northern Territories where there is a marked wet and dry season. They also occur in the Accra plains.

(c) *Minor Permanent Streams*.—Small streams containing water throughout the year are common in the Gold Coast. They form suitable habitats for the vectors if the water in them flows gently for the greater part of the year. *Biomphalaria pfeifferi* is commonly found in these streams although this species may also occur in large ponds. Snail-hosts are seldom found in those streams in which the rate of flow is fairly fast due to a steeper gradient and a cleaner bed of rocks, pebbles or gravel.

(d) *Larger Streams and Rivers*.—This type of habitat is characterised by the absence of rooted vegetation, steep banks, and a fairly fast flow of water even in the dry season. Such rivers ordinarily do not offer a satisfactory habitat for the survival of the snail-hosts. However, in places where man has interrupted or channelled the normal flow by building large solid jetties, drifts, dams, and sheltered channels, etc., the snails may be able to survive. Also in the meander-belt of the rivers the formation of ox-bow lakes may occur and in these the vectors can survive. For example, in the partially formed ox-bow lake at Ochiso, *P. africana* is particularly abundant following the subsiding of the wet season floods.

Habitats in Still Water

(a) *Temporary Ponds*.—Such ponds contain water only a few months each year following the rains. Owing to the long periods of drought these ponds only very rarely harbour fresh-water snails.

(b) *Perennial Ponds*.—In this category are included ponds, borrow pits, cattle-drinking holes, deep ditches, etc., in which water persists for 10 or more months of each year. Such habitats are common throughout the Gold Coast and they offer ideal conditions for the survival and multiplication of the snail-hosts. *P. africana*, *B. (P.) forskalii* and *B. truncatus* can readily adapt themselves in even the smaller ponds belonging to this group. *Biomphalaria pfeifferi* seems to require larger ponds to survive satisfactorily although this species has occasionally been observed in fairly small ponds, e.g., the "crocodile" pond at Wa.

(c) *Dams and Reservoirs*.—This type of habitat is in many respects analogous to the largest ponds and it likewise offers ideal conditions for the survival of the snail-hosts—especially when some aquatic vegetation is present. Although *B. (P.) forskalii* snails often occur in small numbers in this type of habitat they seem to prefer the environment offered by the smaller perennial ponds—see (b) above.

(d) *Lagoons and Swamps*.—In the general this type of habitat seems only partially to offer a satisfactory environment. The snails are never numerous where the aquatic vegetation is dense but are often plentiful (especially *P. africana*) where the aquatic plant growth is either artificially or naturally reduced. In the Ke Lagoon, and probably in the other fresh-water lagoons bordering the Volta, *B. truncatus* and *B. (P.) forskalii* occur in fair numbers.

(e) *Lakes*.—No vectors were found along the shore of Lake Bosumtwi, the only lake in the Gold Coast. It seems that Lake Bosumtwi does not provide a suitable habitat for any of the snail-hosts probably because of its great depth and the steep gradient of its wave-eroded shore. At the same time, however, it should be noted that the snail vectors have not been found anywhere near the lake and this alone may be the factor responsible for their absence.

In summarising the types of fresh-water habitats available to the snail-hosts in the Gold Coast, it is apparent that the most suitable are those in which the water is either calm or gently flowing and remains in the habitats for the greater part of the year. Nevertheless, *B. pfeifferi*, in particular, seems able to survive in streams with a fairly fast rate of flow. *B. truncatus* and *B. (P.) forskalii*, on the other hand, prefer calmer and more sheltered environments and in the largest of these they may be joined by *B. pfeifferi*. With regard to *B. (P.) forskalii* the largest number are usually recorded in the smaller type of perennial pools and it would appear that the conditions there are optimum for their survival.

Factors in the environment which appear to influence the survival of the Vectors

It is well known that all aquatic environments undergo an orderly series of seasonal changes and that molluscs as members of that environment are markedly influenced by such changes. The food supply of the snails which consists mainly of algae and decaying vegetable matter is optimum in the dry season when the

temperature of the water is maximum and its volume is least. It was regularly observed that the vectors were commonest in habitats containing a rich but not dense growth of aquatic plants at the end of the dry season. In those ponds containing little nutritive material the snail-hosts were seldom found.

The presence or absence of aquatic plants also seems to regulate the density of the snail population. All the species seem to prefer to deposit their egg batches near the surface of the water and the leaves of aquatic plants are often utilised for this purpose. It is reasonable to believe that the presence of aquatic plants also provides the snail with some degree of protection from such predators as fish and birds. On the other hand, it has frequently been observed that the vectors are never abundant in ponds which contain a dense surface growth of pelagic plants such as *Pistia sp.* and *Azolla sp.*

Light, apart from its influence on the growth rate of the microflora, is not ordinarily an important factor influencing populations of snails in their aquatic environment. The vectors were found both in heavily shaded and open habitats.

Similarly, temperature is not considered to be a critical factor affecting the snails in the Gold Coast, although the growth rate of juvenile snails seems to increase at higher temperatures. In habitats occupied by the snail-hosts the temperature recorded during the present investigation ranged between 29.5° C and 20.0° C with a mean temperature of 26.9° C. It is well known that this temperature range is suitable for the survival of snails, and it seems, moreover, that the extremes of temperature which are harmful to snails rarely if ever, occur in the Gold Coast. GORDON *et al.* (1934) have shown that the optimum temperature for *Planorbis pfeifferi* and *Physopsis* lies between 25° C and 33° C as assessed by the lowest death rate of the snails. Our laboratory observations have confirmed these findings and furthermore, it was recorded that development of the vectors is rapid at temperatures of 26° to 30° C.

The type of substratum of the habitat obviously influences the snail population by its direct effect on (a) the amount of available food supply and (b) the chemical properties of the water. In general, it was observed that a substratum of clean sand or gravel supports fewer snails than a substratum composed of rich organic soil which provides a more suitable set of environmental conditions. The latter type of substratum is very common in the Gold Coast but the former is not uncommon in habitats containing flowing water.

During the present investigation precise observations on the relationship between the chemical and physical properties of the water and the mode of survival of snail communities were not conducted. However, the vectors are susceptible to low degrees of salinity for they are not found in brackish water. In connection with the physical properties of the water, it has been noted previously that the vectors prefer quiet habitats. Continuous wave action and a fast rate of flow are undoubtedly important factors impeding the snail-hosts from widely colonising Lake Bosumtwi and the larger rivers (Volta, Birim, etc.).

Dispersal of the Snail-hosts

In an investigation of the epidemiology of schistosomiasis the mode of dispersal of the snail vectors from one habitat to another should be considered.

Although the snail-hosts are widely dispersed in the Gold Coast their distribution is localised and occasionally not contiguous. Two important factors which must be considered in snail dispersal are their capacity to resist desiccation and their ability to establish a population from a single specimen. There are probably several means by which the vectors are able to spread to new habitats. It is clear that when the vectors are introduced into a river system they are capable of spreading to suitable habitats throughout that system, and this indeed has often been observed in the Gold Coast. Moreover, isolated dry season pools may be colonised during the rainy season when these are connected by floods with other snail infested habitats. However, many snail-occupied habitats are truly isolated even during the wet season and it is only possible to speculate on the means by which the snails were originally introduced. It is probable that the molluscs or their ova were accidentally transported on such human utensils as fish nets, traps, and water containers, or by birds, frogs, crocodiles, cattle, etc. Certainly there is some justification for the opinion that the activities of man play an important part in snail dispersal. The vectors are more frequently found in habitats in the close vicinity of man than in localities far removed from human activity, even though the latter seem no less suitable for their survival.

Fluctuations in the Density of Snail Populations in their Natural Environment

Seasonal variations in the density of the snail populations in their natural habitats are being recorded. These observations may be summarised as follows:—

- (a) All vectors species (*P. africana*, *B. truncatus* and *B. pfeifferi*) bred throughout the year as assessed by the regular recording of egg masses and juvenile snails.
- (b) The greatest number of snails seems to occur at the beginning of the dry season and fewer are found either when the habitats are flooded or nearly dry. At Dawa, for example the vectors (*Physopsis* and *Bulinus*) were observed to be abundant during the beginning of the dry season but became rare during the wet season. This observation has a close bearing on studies concerned with the distribution of the vectors. It is evident that the best results will be obtained if the survey is carried out during the beginning of the dry season when the snails are most numerous and the habitats are sharply marked. Should surveys be performed during the wet season a series of false negatives are likely to be obtained. In the present investigation snail surveys in the Gold Coast were made most frequently in the dry season.
- (c) The greatest number of empty shells were observed both at the end of the wet season and at the end of the dry season, indicating that mortality is greatest during these periods. However, further evidence is required to verify these initial observations.

(d) There is preliminary evidence to indicate that the vectors are stimulated to oviposit when subjected to a change in their environmental conditions and this may in part be due to an alteration in temperature. It was frequently observed that adult wild snails deposited egg masses soon after their arrival in aquaria and that the rate of ovipositing subsequently decreased when the temperature of the water remained constant. Egg laying was again stimulated when the snails were subjected to a further abrupt change in the temperature of their environment. It is probable that other factors may be involved in the stimulation of oviposition.

(f) *Factors associated with the epidemiology of schistosomiasis in the Gold Coast.*

It is well known that the rate of infection is greatest among human populations living closest to the snail habitats. Persons whose occupations and activities bring them in continual contact with snail-infested water are more severely infected than those who only occasionally enter such habitats. The fresh-water fishermen (e.g. at Akuse and around the Ke Lagoon, etc.) have a considerably higher rate of infection than the cocoa farmers of Ashanti and elsewhere. Children who attend the herds of cattle in the Northern Territories frequently swim in the snail-infested cattle-watering holes and thereby are more often exposed to infection than other children living in the same areas. High rates of infection are known to exist among labourers who are engaged in weed-clearing in the snail-infested Owabi reservoir which supplies Kumasi. Farmers and their families growing rice and sugar-cane in swampy land (e.g. Mepom, Swedru, Nsaba regions) are more often exposed to schistosomiasis than neighbouring farmers who grow cassava and guinea-corn in drier lands.

(g) *Distribution and Incidence of Schistosomiasis*

An assessment of the importance of schistosomiasis cannot be made in the absence of statistical information. In the Gold Coast knowledge of the incidence and distribution of the disease is now being recorded by the Medical Biologist and also by the staff of the Medical Field Units during routine diagnostic surveys in the Northern Territories, Ashanti and Togoland. As expected there appears to be a close correlation between the distribution of the human infection and the distribution of the snail-hosts.

(1) *Schistosoma haematobium infection in the Gold Coast*

This disease, as assessed by high rates of infection, is confined to two extensive areas, one each occurring in the Colony and in the Northern Territories, and smaller subsidiary foci occur in Ashanti. There appears to be a close correlation existing between the areas where the disease is endemic and the distribution of the snail-hosts.

It is evident that the incidence of infection even within the endemic areas varies considerably from place to place. For example, at Pokoasi and Maiyera the incidence of infection in local school children exceeds 75 per cent but in the neighbouring villages of Agbogba, Ashongman and Ablaygee the incidence is less than 30 per cent (see Tables (B) and (C)). Such variation is undoubtedly related to the frequency of contact between man and the habitats of the intermediate snail-hosts and also to a lesser extent, to the other epidemiological factors already discussed.

Incidence of S. haematobium infection in persons belonging to different age-groups

The examination of urine for the ova of *S. haematobium* is a convenient method that has long been used to determine the incidence of infection. In this connection the observations of BUCKLEY (1956) and GERBER (1952) have shown that ova occur more frequently in the urine of younger persons than in that of older persons. The results of observations recorded in Tables (B) and (C) indicate that a similar picture may exist in the Gold Coast. It will be noted that a higher incidence of infection, as assessed by the output of ova, was observed in persons under 20 years of age than in older persons. These results indicate that persons belonging to the younger age-groups are more responsible for the transfer of infection to the snail-hosts than older persons. It seems, moreover, that the behaviour of children in this respect is of the utmost significance since they, more than any other section of the population, amuse themselves by swimming in the habitats of the snails.

TABLE (B)

SHOWING THE DEGREE OF *S. Haematobium* INFECTION IN PERSONS BELONGING TO DIFFERENT AGE GROUPS AND LIVING IN A HYPERENDEMIC LOCALITY (MAIYERA) IN THE GOLD COAST

Age group	No. examined		No. infected		Total examined	Percentage infected
	Male	Female	Male	Female	Total infected	
2 to 15 years	54	27	52	27	81/79	97.5
15 to 20 years	12	5	9	3	17/12	70.5
Over 20 years	46	45	8	13	91/21	20.8
Total	112	77	69	43	189/112	59.2

TABLE (C)

SHOWING THE DEGREE OF *S. Haematobium* INFECTION IN PERSONS BELONGING TO DIFFERENT AGE GROUPS AND LIVING IN AN ENDEMIC LOCALITY (AGBOGBA AND ASHONGMAN IN THE GOLD COAST)

Age group	Number examined	Number infected	Total examined	Percentage infected
			Total infected	
2 to 15 years	109	27	109/27	24.7
Over 20 years	88	6	88/6	6.8
Total	197	33	197/33	16.7

TABLE (D)

SHOWING FREQUENCY OF *S. Mansoni* INFECTION DURING ROUTINE EXAMINATION OF STOOLS IN HOSPITAL LABORATORIES IN THE GOLD COAST

Hospital Laboratory	No. of stools examined and No. positive for <i>S. mansoni</i> infection	YEAR									
		1941	1942	1943	1944	1945	1946	1947	1948	1949	1950
Accra ...	No. of stools examined ...	4,453	5,488	—	—	3,521	2,496	2,985	4,082	5,797	4,617
	No. of stools positive ...	2	11	—	—	9	6	6	7	4	4
Kumasi ...	No. of stools examined ...	—	3,955	—	—	—	1,730	3,545	5,791	6,580	7,716
	No. of stools positive ...	—	—	—	—	—	4	12	19	29	—
Sekondi ...	No. of stools examined ...	—	2,586	4,595	4,463	—	3,241	4,529	4,423	4,940	4,147
	No. of stools positive ...	—	21	12	25	—	7	12	15	9	—
Tamale ...	No. of stools examined ...	—	1,383	—	689	—	—	—	—	—	1,568
	No. of stools positive ...	—	7	—	6	—	—	—	—	—	14
Koforidua ...	No. of stools examined ...	642	1,219	547	701	—	943	—	—	136	—
	No. of stools positive ...	4	8	2	1	—	2	—	—	—	—
	Total No. stools examined	5,096	14,631	5,142	5,853	3,521	8,410	11,059	14,116	17,453	18,048
	Total No. stools positive	6	54	14	32	9	19	30	41	42	18

TABLE (E)

SHOWING RATE OF INFECTION (PERCENTAGE) OF *S. Haematobium* AND *S. Mansoni* RECORDED DURING 1950 AND 1951 AT HOSPITAL LABORATORIES THROUGHOUT THE GOLD COAST

STATION	<i>Schistosoma mansoni</i>				<i>Schistosoma haematobium</i>			
	YEAR 1950		YEAR 1951		YEAR 1950		YEAR 1951	
	Total No. faeces examined	Percentage with <i>S. mansoni</i>	Total No. faeces examined	Percentage with <i>S. mansoni</i>	Total No. urines examined	Percentage with <i>S. haematobium</i>	Total No. urines examined	Percentage with <i>S. haematobium</i>
Child Welfare Clinic ...	—	—	3,096	0.1	—	—	396	3.2
Bekwai ...	—	—	296	—	—	—	197	6.5
Sekondi ...	4,147	0.3	5,172	0.2	3,327	1.9	2,995	2.5
Kibi ...	458	—	138	1.6	720	18.9	185	60.0
Hohoe ...	161	—	69	—	183	2.7	250	1.6
Tamale ...	1,568	0.9	1,417	—	414	14.0	818	10.0
Winneba ...	3,664	—	4,448	0.1	3,572	6.9	4,443	8.0
Tarkwa ...	482	5.2	554	2.0	228	39.1	480	10.0
Yendi ...	—	—	276	—	—	—	109	9.0
Cape Coast ...	1,750	0.1	1,262	0.02	1,638	5.1	1,441	4.0
Takoradi ...	1,043	0.2	609	—	1,854	1.1	2,149	3.5
Leprosy Service ...	—	—	989	—	—	—	612	1.5
Gold Coast Hospital, Accra ...	1,864	—	2,177	0.001	2,988	6.5	3,749	2.1
Keta ...	1,560	—	6,265	—	184	15.2	269	15.4
P.M.L. Hospital, Accra ...	280	—	546	—	62	—	228	8.0
Oda ...	2,559	—	3,953	—	3,034	30.7	1,858	30.0
Wa ...	—	—	528	—	—	—	373	12.0
Navrongo ...	819	0.7	744	0.8	740	41.4	450	36.0
Axim ...	575	0.3	771	0.8	474	11.6	696	7.8
Sunyani ...	1,099	—	780	—	677	6.8	960	9.0
Bawku ...	1,347	1.1	1,253	1.1	2,431	7.9	1,209	12.0
Ridge Hospital, Accra ...	900	—	1,101	—	1,623	0.2	2,081	—
Koforidua ...	136	—	672	0.01	178	55.1	474	23.0
Mental Hospital, Accra ...	255	0.2	922	0.1	525	14.3	424	2.0
Kumasi General Hospital ...	7,716	0.3	6,847	0.1	4,331	28.4	6,520	5.0

Schistosoma mansoni infection in the Gold Coast

Few data are available on the incidence and distribution of intestinal schistosomiasis apart from routine observations recorded in hospital reports. In Tables (D) and (E) is shown the frequency of *S. mansoni* ova found in stools examined in hospital laboratories, and it can be seen that the rate of infection is low. Such a low rate is not surprising in view of the limited distribution of the snail-hosts, *B. pfeifferi*. It is believed that the foci of intestinal schistosomiasis are confined to Tarkwa, Owabi and to a few areas in the Northern Territories especially in the neighbourhood of Bawku. Not only are the vectors found in these localities but the incidence of infection seems to be higher in patients attending hospitals in these areas (Table (E)). For example, at Tarkwa in 1945 the Medical Officer reported that schistosomiasis was increasing in the area, 88 cases being treated during the year. In 1946, in the same area, 16 per cent of 125 local school children were found to be infected with *S. mansoni*. Moreover, between 1947 and 1950 an average of 25 cases of intestinal schistosomiasis per year attended the hospital for treatment. During the present investigation at Tarkwa the snail-hosts (*B. pfeifferi*) were observed in large numbers in a small stream used for washing and bathing. A number of snails were collected and from a few of these furcocercous cercariae of *S. mansoni* emerged. There is little doubt that local infection is incurred in the stream and from the evidence already presented it seems that the locality is a principal focus of intestinal schistosomiasis in the Gold Coast.

It is evident that the incidence and distribution of intestinal schistosomiasis is considerably more restricted than that of urinary schistosomiasis although the infection may later prove to be much more common in the Northern Territories as the vector snail (*B. pfeifferi*) is more widely distributed there.

(iv) SUMMARY AND CONCLUSIONS

1. Observations on the distribution and ecology of the snail hosts of *S. haematobium* and *S. mansoni* in the Gold Coast and British Mandated Togoland are described.
2. Data relating to the distribution, incidence and epidemiology of vesicular and intestinal schistosomiasis are given.
3. *S. haematobium* infection together with its snail vectors *Physopsis africana* and *Bulinus truncatus* is shown to be much more widespread than *S. mansoni* and its planorbid vector *Biomphalaria pfeifferi*.
4. The principal vector of *S. haematobium* is *P. africana*, this species being far more widely dispersed than *B. truncatus* which is quite restricted.
5. *Bulinus (Pyrgophysa) forskalii* is suspected of being an additional vector of *S. haematobium* but although it is widespread, there is yet no definite evidence to show that it is capable of transmitting the parasites.

CHAPTER X

THE MENTAL HEALTH SERVICE

(i) GENERAL

During 1954, progress was made with the formulation of plans for the erection of a new Mental Hospital at Kumasi, and proposals for the erection of a second Mental Hospital in the Northern Territories were under consideration in the Ministry; a large proportion of patients in the existing hospital are of Northern Territories origin, and the number so admitted remains at a high level, such as to suggest that this solution might be a satisfactory one; mental patients from the North who were treated within their own environment might be expected to stand a better chance of recovery than, as now, in an environment different to their own.

It became necessary, as an urgent measure, to spend the sum of £40,000 during 1954 on further extensions to the present Mental Hospital in order to house the ever-increasing number of resident patients; these extensions included an additional two dormitories, an equipment store, a patients kit store, and extensions to the kitchen. A modern water carriage sewage disposal plant was also installed.

The staff was increased during the year by the posting of a second doctor, to assist the Specialist Psychiatrist, and by the appointment of a male superintendent.

(ii) RESIDENT PATIENTS

The total number resident on January 1st, 1954 was 869, comparing with 736 on January 1st, 1953. The number of new admissions during the year was 545, as compared with 477 during 1953. The greatest number of patients resident on any one day was 1,030 as compared with 868 in 1953, and the daily average number was 968.4 as compared with 794 in 1953. 600 patients were employed daily on occupational therapy, sanitation, and other domestic services in and outside the institution, as compared with 450 so employed during 1953. Of the grand total of 1,354 patients under treatment during the year, 54 escaped, of whom 36 were re-captured. 164 male and 44 female lunatics became of sound mind and were discharged; deaths numbered 139. Table LXXIX of Appendix "H" gives details of admissions, discharges, deaths, and escapes as well as of the number of resident criminal lunatics for the years 1952-1954. Table LXXX gives details of the distribution of new admissions by nationality in 1954 and compares them with 1953 and 1952. Table LXXXI details the 11 main causes of mortality amongst resident patients.

(iii) BED STRENGTH

(a) Sick Beds

During 1954, the two infirmaries male and female, contained a total of 38 beds which was considered inadequate but extensions to dormitory accommodation which were being carried out at the end of the year should make it possible to increase the bed strength in the male infirmary. During 1954 a six-bed ward was set aside for patients suffering from pulmonary tuberculosis.

(b) Resident Patient Beds

At the end of 1954 the hospital contained 312 bedsteads and 557 bed boards, equipment with bedsteads proceeding throughout the year.

(iv) WORK DONE

The important mental disorders diagnosed and seen at the hospital were, in order of importance, as follows:—

Schizophrenia	23 cases
Homicidal mania	11 ..
Manic Depressive Psychosis	10 ..
Insanity with Epilepsy	10 ..
Acute Mania	4 ..
Insanity with Organic Lesion	4 ..
Involutional Insanity	3 ..
Acute Confusional Insanity	3 ..
Toxic Insanity	3 ..
Dementia	3 ..

It was observed that 660 patients remained undiagnosed at the end of the year.

One hundred and seventy-seven patients were treated by electric convulsive therapy during 1954; 66 showed evidence of improvement, whilst in 111 cases there was no improvement as a result of this treatment.

Out-patient work done at the hospital was mainly for patients under the care of or referred to the Specialist Psychiatrist at the hospital; the total attendance during the year was 802 (494 males and 308 females) 125 cases were seen at the Psychiatric Out-patient Clinics at the Gold Coast and Ridge Hospitals, these being cases referred to the Specialist Psychiatrist mainly from doctors working in these hospitals; six patients were of European extraction, and two were Asiatics. 57 in all of these cases were Civil Servants. In the case of the European Officers, all were Anxiety Psychoneuroses; some were inadequate personalities who had difficulty in making a satisfactory adjustment to their new environment. Of the African Officers, a number suffered from Anxiety Neuroses related to their work particularly where there had been promotion with added responsibilities.

Group Therapy was introduced amongst the resident patients during the year, 13 groups being established and functioning satisfactorily. Group leaders were chosen from amongst the nursing staff, each leader being thoroughly indoctrinated in the technique of group therapy and the management of a group.

During August, 1954, a further experiment was introduced in the form of a selection panel of twelve, chosen from amongst rehabilitating patients. This panel had the function of screening all patients recommended for discharge from the rehabilitation ward back into society. The panel served as a training group to exercise logical thinking, good judgment, group activity, and a share of responsibility. It functioned well, and since its inception 45 patients were voted back into the ward, nine being discharged.

(v) RESEARCH WORK

During 1954, experimental treatment was carried out using three drugs said to be of benefit in psychiatric practice. The findings were as follows:—

- (a) *Mysoline*.—18 epileptics, ages ranging from 15 to 35 years, were treated for periods ranging from 3 months to 14 months. Mysoline was found to be an important addition to the existing group of anti-convulsants and particularly valuable in cases of grand mal epilepsy. In patients suffering from insanity with epilepsy it appeared to have a beneficial effect on the mental aberration.
- (b) *Largactil* (Chlorpromazine Hydrochloride).—54 patients were treated with this drug. 17 out of 26 males, and 20 out of 28 females improved with treatment, it being found that the drug was most useful in curbing the disorders of behaviour and rendering the patient more amenable to other forms of treatment.
- (c) *Serpasil* (Reserpine).—A few patients only were treated with this drug which, apart from its tranquilising effect, appeared to have no major beneficial results.

CHAPTER XI

THE LEPROSY SERVICE

(i) GENERAL

During 1954 the Leprosy Service has continued to expand despite set-backs due to shortage of staff. The out-patient centres number 225 as compared with 164 in 1953, but despite the fact that adequate supervision has not been readily available, the number of patients under treatment continued to increase; at the end of the year there were over 19,000 persons under treatment.

As confidence in the efficiency of treatment grows the importance of the out-patient clinic as a centre of treatment increases; and the establishment of such clinics therefore is one of the most important functions of the Leprosy Service. In these clinics established during 1954, treatment was being given either by members of the Leprosy Service, officers of various grades in the Ministry of Health, Christian Missionaries, or other voluntary agencies.

Statistics for each Region are summarised below:—

Region	No. of Clinics	LEPROMATOUS CASES					NON-LEPROMATOUS CASES					Grand Total
		Men	Women	Boys	Girls	Total	Men	Women	Boys	Girls	Total	
Eastern	49	410	209	40	42	709	1,392	1,658	544	427	4,021	4,722
Western	49	302	116	49	18	485	728	1,145	305	256	2,429	2,914
Trans-Volta/Togoland ...	19	86	45	7	3	141	176	197	33	33	439	580
Ashanti	50	191	145	20	15	371	1,111	1,308	478	383	3,280	3,651
Northern Territories ...	34	336	175	51	13	575	1,748	1,892	494	473	4,602	5,177
West	24	96	68	4	4	172	955	1,432	187	217	2,791	2,963
Total	225	1,421	758	171	95	2,445	6,100	7,632	2,041	1,789	17,562	20,007

(ii) LEPROSARIA

Leprosaria are established at Ankaful, near Elmina in the Western Region, the headquarters of the Leprosy Service, at Ho in Togoland, and at Kpandae in the Nanumba District of the Northern Territories. The latter is run by the World Wide Evangelisation Crusade. A further Leprosarium was under construction for the Leprosy Service at Kokofu in Ashanti, near Lake Bosomtwi which is the traditional refuge of lepers. During 1954 the search continued for a suitable site on which to construct a leprosarium in the Northern Territories to serve the heavily populated North-eastern part of the country. A site at Pwalagu on the River Volta was under consideration at the end of the year.

At Ankaful leprosarium the building programme was about completed by the end of 1954. Patient accommodation was provided for 450 persons. A hospital of 90 beds including a sanatorium block of 20 beds for cases suffering from concurrent pulmonary tuberculosis had been completed. A school building containing six class rooms for children and adults was in full use, and a kitchen was functioning which provided meals for about 200 persons, hospital patients and destitutes. The settlement was supplied with electric light from the Cape Coast town supply. The settlement farm prospered during 1954 and supplied all the carbohydrate needed for feeding the hospital patients and destitutes, despite a set back when the rice crop failed due to lack of supervision. The flock of sheep and small herd of cows continued to prosper during the year, all animals maintaining a good state of health. The horticultural side of the patients work was stepped up towards the end of the year as the building programme drew to an end, the intention being to transform the settlement into a garden village.

Of the crippled patients, 30 were employed and employed themselves in basket making, earning pocket money by this means. All children admitted to the settlement and all adolescents who have been to school attended school daily, under the direction of Mrs. A. McKelvie. The services of a paid teacher are not yet available at the settlement.

(iii) MINOR SETTLEMENTS

Minor settlements are established at Weija near Accra, Yendi in the Northern Territories, and at Kumasi, the Ashanti capital. Apart from Yendi, these are not satisfactory, being isolation camps, difficult to control, and having the bare minimum of facilities. Efforts have been made for some years to close these camps.

CHAPTER XII

MATERNITY AND CHILD WELFARE SERVICES

The Statistical Tables referred to in this Chapter will be found in Appendix "I".

(i) MATERNITY

(a) Hospitals

During the latter part of 1954 the Maternity Hospital at Mampong (Ashanti) was opened; also during the year the Jirapa Hospital was completed; although not primarily a Maternity Hospital, Jirapa was built as providing proper facilities for an existing large maternity clinic at the Catholic Mission there, and for the training of midwives. The number of hospitals in which maternity work is a main interest was, at the end of 1954, made up of the following:—

The Maternity Hospital, Accra.
The Maternity Unit, Kumasi Central Hospital.
The Maternity Hospital, Mampong-Ashanti.
St. Joseph's Hospital, Jirapa, Northern Territories.

The Maternity Hospital, Accra, continues to admit a very large number of women both ante-natal and post partum cases which should be treated in the wards of a general hospital. Ante-natal conditions treated included: Malaria (140 cases), Bacillary Dysentery (20 cases), Amoebic Dysentery (27 cases), Lobar Pneumonia (18 cases). When the accommodation position at the Gold Coast Hospital improves admission of this type of case to the Maternity Hospital will cease. Table LXXXII gives the incidence of a number of conditions resulting from pregnancy seen in Gold Coast hospitals. It will be observed that the total number of abortions treated—2,431 cases—is extremely high, Ashanti accounting for 901 cases; each termination of pregnancy in this manner means that a child life has been lost to the country. The incidence of retained placenta was high (508 cases), and here again the majority of cases were seen in Ashanti.

Table LXXXIII gives the number of maternal deaths from these conditions, by Regions. It will be noted that Retained Placenta accounted for the greatest number of deaths (28) followed by Ectopic Pregnancy (18 deaths). Table LXXXIV gives an account of hospital deliveries by Regions, detailing the type of delivery. Table LXXXV shows the number of deaths of mothers during delivery, according to the method of delivery. Classical Caesarean section accounted for the largest number of maternal deaths (53 cases) followed by forceps delivery (39 cases). Table LXXXVI gives the same information in respect of infants born in hospitals; detailed figures from Accra are not available for Forceps Delivery or Caesarian Section, these being grouped under "Others". The heading "Others" includes Ruptured Uterus, which is an important cause both of maternal and foetal death. 594 infants died during normal delivery, and 218 (plus Accra figures) died during Forceps Delivery. Table LXXXVII gives the live and still-births occurring in hospitals by regions in 1954. It will be noted that the total number of live and still-births is rather less than the number of deliveries recorded in Table LXXXIV. The discrepancy is due to the number of foetal deaths the deliveries of which are included under "Other" in the Table of Deliveries, but which are not classed as "Still Births".

(b) District Maternity Clinics

Table LXXXVIII details the volume of maternity work being carried out at District Clinics in the Regions. It will be observed that no activity at all was reported from Trans-Volta/Togoland. This was probably due to a lack of supervision during 1954 of midwives in that region, from which no returns were received. The Northern Territories also showed very small returns, but this was due to the lack of private midwives in the region. Returns from the Eastern Region were likewise not complete. Ashanti and the Western Region alone, due to a well-organised system of supervision of midwives, produced overall records for 1954, and those for Ashanti were the most complete.

(c) Red Cross Clinics

Table LXXXIX shows the work of the Red Cross in the Eastern and Western Regions. In the Eastern Region the activities of Red Cross Staff are confined to Koforidua and its immediate surroundings; here a flourishing clinic was being built up during 1954.

In the Western Region, the results have not been so successful during 1954, and Table XC compares the ante-natal attendances during the year with those in 1952 and 1953. A steady decline in attendance at the older clinics was encountered during the year.

(ii) CHILD WELFARE

(a) General

A limited amount of Child Welfare work is carried out at district hospitals where medical officers are particularly interested in this aspect of preventive medicine, but the greatest number of clinics were run with the co-operation of private district midwives. Table XCI details the regional attendance at such clinics, held either at hospitals, Red Cross Centres, or at Child Welfare Centres under the supervision of a Superintendent of Health Visitors. In the Northern Territories there was only a hospital clinic service apart from Bimbilla Health Centre; the Trans-Volta/Togoland figures refer to Keta Hospital only.

(b) Work of the Health Visitors

The Health Visiting Service was still badly handicapped by shortage of Junior Staff and the extension which should have been made possible by the appointment of an additional Superintendent of Health Visitors in June and another in July was considerably limited.

Four Student Health Visitors passed their examinations in January, 1954 thus increasing the staff by two State Registered and two Qualified Health Visitors but as two of these went on maternity leave and a third resigned before the end of the year the benefit of their services was not available for very long.

The co-operation of some of the private midwives made it possible to increase the numbers of Child Welfare Centres (i.e. clinics for well babies) and for the Superintendent of Health Visitors to supervise the health and progress of many more children under five years of age than would otherwise have been possible. With the exception of those in Trans-Volta/Togoland who were visited every three to four months, and the Northern Territories, all private midwives were visited at least once a month and their premises, equipment and registers inspected. In addition the inspection of Local Council Dressing Stations was undertaken.

Most of the senior staff were asked to give lectures or talks at various times throughout the year. In Accra the Senior Superintendent and Health Visitors Tutor gave lectures at the School of Social Welfare on Maternity and Child Welfare and Nutrition; lectures were also given to the Local Government Training School and the Girls Vocational Training Centre. In Kumasi the Superintendent of Health Visitors lectured on Public Health to the Midwifery pupils. From 1st February to 31st August, 1954 the Health Visitor Tutor was posted as Sister Tutor to the Mental Hospital. With regard to Health Visitor training, six students completed their first term at the School of Hygiene and appeared very interested in Health Visiting. They are becoming more and more interested in methods of Health Education and no difficulty was experienced in getting volunteers to give a health talk or a demonstration. Their posters may not be professional but show keenness.

Two days a week were spent in Home Visiting with the Superintendent of Health Visitors; students have their own districts (Teshie and Mamprobi) and attendances at Child Welfare Centres have improved considerably.

Accra

In order to maintain a fairly comprehensive Health Visiting service as a training field for students, the majority of the Health Visitors were stationed in Accra. Routine home visits in some districts and special visiting in all parts of the town were maintained throughout the year and 18 Child Welfare Centres operated successfully, although at times under difficulties, with an attendance of over 6,000 a month. The people are becoming more responsive; they listen with interest to and are more ready to accept the advice and teaching of the Health Visitors.

School Hygiene inspections were carried out by the student Health Visitors under the direct supervision of the Superintendent of Health Visitors. They gained valuable experience in health teaching and their talks were much appreciated by the staff. Schools inspected were the Mamprobi Methodist Primary and Abossey Okai Presbyterian School.

Koforidua

The Superintendent of Health Visitors was relieved of hospital duties and posted to the Red Cross Clinic in June, 1954. The clinic needed some reorganisation and this together with the large attendances of sick children left her with little time for health work. She undertook the supervision of midwives in the Koforidua district.

A Health Visitor was transferred from Accra at the end of August and she has been responsible for domiciliary visiting and the Child Welfare centres held in various parts of the town. These additional centres were opened and attendances at all the other centres improved.

1953 Attendances at Child Welfare Centre	..	..	..	..	..	8,055
1954 Attendances at Child Welfare Centre	..	..	..	..	..	12,176

Western Region

A superintendent of Health Visitors was sent to Cape Coast in June to help the Medical Officer, Saltpond in the training of Health Centre Superintendents in Maternity and Child Welfare. She undertook the supervision of midwives in the Western Region and advised and assisted the Red Cross Committee, Cape Coast, in the reorganisation of their clinics.

Kumasi

For the greater part of the year there were only two Health Visitors working in the town and the number of domiciliary visits made was therefore small. With the co-operation of private midwives who voluntarily provided helpers, three new Child Welfare Centres on the outskirts of the town were opened, and attendances at all such clinics were slowly increasing.

January, 1954 Total Attendances at Child Welfare Centres	..	..	..	1,414
December, 1954 Total Attendances at Child Welfare Centres	..	..	..	2,458

It was found necessary to continue the weekly supervision of midwives practising in the town.

Rural Ashanti

Since June when a second Superintendent of Health Visitors was posted to Ashanti the midwives were visited approximately twice in each month and in this way it was possible to create and maintain an interest in Child Welfare.

Each village where there is a midwife had weekly Child Welfare Clinics at which the Superintendents of Health Visitors assisted when visiting. A few of these midwives gave talks in nearby villages, but it was noticed that they lost interest if not frequently visited and encouraged.

1953 Attendances at Child Welfare Centres in Rural Ashanti	..	..	..	6,581
1954 Attendances at Child Welfare Centres in Rural Ashanti	..	..	..	15,525

(c) *Diseases seen and treated at Children's Clinics and Hospitals*

The statistics in this section were in respect of cases treated at the Princess Marie Louise Hospital for Children, Accra, the Kumasi Child Welfare Clinic, and the Red Cross Clinics at Cape Coast and Koforidua. These are long established centres for the treatment of young children; in 1953 and previous years, the statistics have been included in the general hospital statistics of the country. The figures refer only to cases seen and treated on or after January 1st, 1954.

(1) TUBERCULOSIS

(a) *Respiratory Tuberculosis*.—The only cases reported during 1954 were from the Princess Marie Louise Hospital for Children, Accra, where 19 in-patients (2 deaths) and 11 out-patients received treatment during the year.

(b) *Non-respiratory Tuberculosis*.—Seven cases (4 deaths) received in-patient treatment and four cases received out-patient treatment during the year. These were all seen at the Princess Marie Louise Hospital, Accra; of these cases four in-patients (3 deaths) were suffering from Tuberculosis of the meninges and central nervous system, three cases being seen as out-patients: one in-patient (1 death) was treated for tuberculosis of the intestines, peritoneum and mesenteric glands, and two in-patients (no deaths) were treated for Tuberculosis of the bones and joints. One out-patient was seen suffering from Tuberculosis classified as "Other forms".

(2) VENEREAL DISEASES

(a) *Syphilis*

(i) *Congenital Syphilis*.—Seven in-patient cases (1 death) and 33 out-patient cases were treated during the year; of the in-patients five were females and two were males, and of the out-patients 21 were males and 12 were females.

(ii) *Other forms of Syphilis*.—No other forms of Syphilis were diagnosed at Childrens Clinics during the year.

(b) *Gonococcal Infections*

Seven in-patients (no deaths) and 169 out-patients received treatment during 1954. All these cases were seen at the childrens hospitals in Accra and Kumasi; of these cases seven in-patients (3 males and 4 females) and 156 out-patients (69 males and 87 females) received treatment at Kumasi. Gonorrhoea as a disease of adult life is extremely common in Ashanti, and the figures in respect of children tend to underline this fact.

(3) THE TYPHOID AND PARATYPHOID FEVERS

One in-patient (no death) and one out-patient case of Typhoid fever were diagnosed during 1954; and six in-patient cases (no deaths) and five out-patients were treated for Paratyphoid fever. These cases were all seen at the Children's Hospital in Accra.

(4) THE DYSENTERIES

(a) *Bacillary Dysentery*.—Three hundred and seven cases received out-patient treatment during 1954, made up of 157 males and 150 females. No cases received in-patient treatment. Of the total, 140 males and 132 females received treatment at the Kumasi Children's Hospital.

(b) *Amoebiasis*.—Forty-two cases received out-patient treatment during 1954, made up of 18 males and 24 females. Of the total figure, 18 males and 21 females were seen in Kumasi.

(c) *Unclassified Dysentery*.—Five cases (3 deaths) received in-patient treatment and 3,432 received out-patient treatment during 1954. Of these cases, all in-patients and 1,795 out-patients were treated at Kumasi.

(5) STREPTOCOCCAL SORE THROAT

Thirty-three out-patient cases received treatment at the Accra hospital only, made up of 23 males and ten females. No in-patients were treated during 1954.

(6) DIPHTHERIA

One female case received in-patient treatment at the Accra Hospital, and recovered. No other cases were recorded from children hospitals and clinics.

(7) WHOOPING COUGH

Nine hundred and sixty-two cases, made up of 482 males and 480 females, received out-patient treatment for this condition during 1954, there being no in-patients treated. Of these cases 247 males and 270 females totalling 517 cases were treated in Accra.

(8) TETANUS

Ten cases received treatment during 1954 in Accra and Kumasi. Of these, five in-patients were treated in Accra, and there were five deaths. Four males and one female received out-patient treatment in Kumasi.

(9) ACUTE POLIOMYELITIS

Seven cases (four males and three females) received out-patient treatment in Accra. There were no in-patient cases, and no cases were reported from other centres.

(10) LATE EFFECTS OF ACUTE POLIOMYELITIS AND ACUTE INFECTIOUS ENCEPHALITIS

Six cases (three males and three females) received out-patient treatment in Accra only. There were no in-patient cases.

(11) MEASLES

Ten in-patient cases (three deaths) and 1,166 out-patient cases received treatment during 1954. Of these, one in-patient and 679 out-patients were treated in Accra.

(12) INFECTIOUS HEPATITIS

Five out-patient cases (two males and three females) received treatment in Accra. There were no in-patient cases, and no cases were reported from other centres.

(13) MALARIA

Ninety-seven cases (19 deaths) received in-patient treatment during 1954, and 6,732 received out-patient treatment. Of these, three in-patients (one death) and 175 out-patients were diagnosed as Malignant Tertian Malaria, the remaining 94 in-patients (18 deaths) and 6,557 out-patients being unclassified malaria. For in-patient cases, the mortality from malaria was 22 per cent, reflecting the serious nature of malaria in young children. Of the total number of cases 85 in-patients (15 deaths) and 3,320 out-patients were treated in Accra.

(14) DISEASES OF THE RESPIRATORY SYSTEM

(a) *Acute Upper Respiratory Infections*

One in-patient case (no death) and 2,429 out-patients were treated for these conditions during 1954 in Accra and Kumasi. The majority of cases (2,318) were reported from Accra. No cases were reported from other clinics.

(b) *Influenza*

Two in-patient cases (no deaths) were treated in Accra, no cases being reported from other centres.

(c) *Lobar Pneumonia*

Eight in-patient cases (two deaths) and 11 out-patients were treated during 1954. Except in Accra, this condition was treated in out-patients.

(d) *Broncho Pneumonia*

Twenty-one in-patients (11 deaths) and 517 out-patients were treated during 1954 for this condition. The in-patient cases were all in Accra. The mortality amongst in-patients was 50 per cent and reflects the serious nature of this condition as a cause of death in young children. Selection of cases for admission is necessitated by the limited number of cots available, and the mortality amongst out-patient cases cannot be computed.

(e) *Primary Atypical, other and Unspecified Pneumonia*

One hundred and nine out-patient cases were classified under this heading during 1954. None were reported from Accra.

(f) *Acute Bronchitis*

Two in-patients (one death) and 218 out-patients were treated during 1954 for this condition.

(g) *Chronic and Unqualified Bronchitis*

Two in-patients (no deaths) and 53 out-patients were treated during 1954.

(h) *Pleurisy*

Three in-patients (one death) were treated in Accra for this condition, no cases being reported from any other centre.

(15) CHICKENPOX

One out-patient case only was seen during 1954, at the Koforidua Clinic. It would not appear to be a disease of very young children in the Gold Coast.

(16) YAWS

Two thousand one hundred and thirty-two cases received out-patient treatment during 1954, 1,562 of these cases being seen at Cape Coast and 505 at Kumasi.

Other Important Diseases

(17) HOOKWORM

This condition was reported from Kumasi only, where 217 cases were treated as out-patients.

(18) TAPEWORM

Three male in-patients (no deaths) and 14 out-patients were treated for this condition during 1954. Two of the in-patient cases and all out-patient cases were reported from Kumasi.

(19) ASCARIASIS

Thirty-four in-patients (five deaths) and 2,188 out-patients were treated for this condition in 1954. Of these cases, 32 in-patients (five deaths) and 1,676 out-patients were reported from Kumasi. The Surgical Specialist in Kumasi in his report commented that *Ascaris* infestation was an important surgical condition, probably accounting for many cases of intestinal obstruction in Africans due to band formation resulting from minute perforations caused by these worms.

(20) GUINEAWORM

The only case of Guineaworm reported was one out-patient case from Koforidua. This condition appears not to be common amongst young children in the areas served by these clinics.

(21) TRACHOMA

One hundred and nineteen out-patient cases were reported from Kumasi but from no other centre. These figures do not give a real indication of the incidence of a condition which is not uncommon even in Accra, as reported by the Specialist Ophthalmologist elsewhere in this Report.

(22) SCABIES

Nine hundred and two cases of this condition received out-patient treatment in the clinics. It is a very widespread infestation, which accounts for a large number of out-patient attendances all over the country and these figures do not provide a real estimate of the incidence.

(23) DEFICIENCY DISEASES

(a) *Beriberi*

Six in-patient cases (no deaths) were treated in Kumasi during 1954. No cases were reported from the other centres.

(b) *Pellagra*

Nineteen in-patient cases (no deaths) and four out-patient cases received treatment during 1954, the in-patient cases being reported from Kumasi.

(c) *Scurvy*

Thirty-nine out-patient cases were treated in Accra during 1954, no cases being reported from Kumasi or the other centres.

(d) *Other Deficiency States*

This heading includes malnutritional states covering a very wide range of degree, from mild nutritional disorders to severe nutritional disease including Kwashiorkor. 144 in-patients (31 deaths) and 1,251 out-patients received treatment during 1954. 108 of the in-patient cases (29 deaths) were reported from Accra.

(24) THE ANAEMIAS

Thirty-six in-patients (10 deaths) and 6,225 out-patients were treated during 1954 suffering from anaemias. A high proportion of the cases reported from Kumasi were listed as hyperchromic anaemias, 18 in-patients (seven deaths) and 1,950 out-patients being so classified. This finding from Kumasi remains the subject of inquiry.

(25) ASTHMA

Two in-patient cases (no deaths) and 518 out-patients were treated during the year. Of the out-patients, 434 cases were reported from Kumasi.

(26) NON-MENINGOCOCCAL MENINGITIS

This condition was reported from Accra only. Three male in-patients (one death) and six out-patients were treated during 1954.

(27) EPILEPSY

Two in-patient cases (two deaths) and four out-patient cases were reported during 1954. Four of the cases were males and two were females.

(28) GASTRO-ENTERITIS BETWEEN FOUR WEEKS AND TWO YEARS

Thirty-five in-patient cases were treated and there were nine deaths. Five hundred and eighteen out-patient cases also received treatment during 1954. Of these cases, 32 in-patients and 244 out-patients received treatment in Kumasi, and the nine deaths were reported from that centre, where, at the beginning of the year 13 in-patient cases remained over from 1953.

(29) GASTRO-ENTERITIS AGES TWO YEARS AND OVER

A total of 252 cases received out-patient treatment for this condition during 1954. No in-patient cases were treated during the year.

(30) CIRRHOSIS OF THE LIVER

This condition was reported from Accra only, where eight cases (two deaths) received in-patient treatment.

(31) CHRONIC ULCER OF SKIN

One female in-patient (one death) and 81 out-patients were classified under this heading during 1954.

(32) DIARRHOEA OF THE NEWBORN

Five in-patients (five deaths) and 76 out-patients were seen and treated during 1954. In severe cases this is a lethal condition. The in-patient cases and 39 out-patient cases were reported from Kumasi.

(33) OPHTHALMIA NEONATORUM

Two hundred and six out-patient cases of this condition were seen during 1954, there being no in-patient cases. The majority were seen at Kumasi (188 cases).

CHAPTER XIII

TRAINING OF MEDICAL AUXILIARIES

(i) OVERSEAS TRAINING SCHEMES

Statistical tables referred to in this chapter will be found in Appendix "J". At the end of 1954, there were 74 Gold Coast Africans training overseas for the medical profession and two training for the dental profession under the auspices of the Gold Coast Government. A number of overseas scholarships for various types of medical auxiliary training were also granted bringing the numbers at the end of 1954 to the following:—

Hospital Administration	..	..	..	4
Laboratory Technology	..	..	..	3
Radiography	..	..	..	6
Physiotherapy	..	..	..	1
Ophthalmics	..	..	..	1
Pharmacy	..	..	..	4
Ward Administration	..	..	..	1
Mental Nursing	..	..	..	7
Librarian	..	..	..	1
Dental Mechanics	..	..	..	1
Institutional Management	..	..	..	1

Of the Medical Scholars, 70 were training in the United Kingdom and four in the United States of America. Also during 1954 the Cocoa Marketing Board sent more medical scholars overseas, bringing the total of such scholars to 50. The greater number of these students are in training at Tübingen, Hamburg, and other German universities. Thus the total number of Gold Coast scholars in training overseas at the end of 1954 to be doctors was 124.

(ii) LOCAL TRAINING

(a) *State Registered Nurses.*

Towards the end of 1954, the first class of nurses undergoing training to State Registered standards was formed at the Kumasi General Hospital, preparatory to the opening of the new Kumasi Central Hospital, scheduled to take place early in 1955.

With the establishment of the Kumasi College of Nursing, there were two such colleges, one in Accra and one in Kumasi, at the end of 1954. The average number of resident students during 1954 was 199, the maximum number of 217 being reached in June, 1954.

With the opening of the Kumasi College of Nursing, the Kumasi Hospital commenced to train two different grades of nurse within the same institution; training to Qualified Registered Nurse has been carried on for some years in Kumasi.

(b) *Qualified Registered Nurses.*

These undergo a training based on the apprenticeship system. This training is carried out in the Gold Coast Hospital, Accra, the Kumasi, Sekondi, Cape Coast, Tamale and Bolgatanga hospitals. Several private hospitals run by Missions and large commercial concerns also train nurses to Qualified Registered Standards. At the end of 1954 there were 316 pupil nurses under training.

(c) *Mental Nurses.*

Mental nurses are trained to qualified registered standards at the Mental Hospital, Accra, where they also receive special Mental nursing training in addition. No qualified Mental Tutor has yet been recruited for the hospital, nor, at the end of 1954 was there a lecture room or any but improvised training facilities. Plans for the construction of a lecture and demonstration room were finalised during the year.

Examination results for Mental Nurses during 1954 were as follows:—

	Number of Candidates	Number of Passes	Number Failed
Preliminary Qualifying Examination	20	13	7
Final Qualifying Examination	31	17	14

(d) *Midwives*

Midwives are trained at the Maternity Hospital, Accra, the Kumasi Midwives Training School, St. Josephs Hospital, Jirapa, Northern Territories, and St. Monica's Hospital, Mampong, Ashanti: both the latter are joint Government/Mission enterprises. The Maternity Hospital Accra trains only girls who are already qualified as nurses whereas the other three take recruits for training solely as midwives.

At the end of 1954 a total of 115 pupil midwives were in training at the various institutions named above.

(e) General comments on Nursing position

The situation reported in the 1953 annual report has become steadily worse during 1954 until the position has nearly been reached where the output of trained nurses scarcely equals the losses due to pregnancy and resignations; added to this, there is increasing difficulty in obtaining suitable girls for training. Tables XCII-XCVII of Appendix "J" indicate the general position in respect of the nursing service. Many resignations of male nurses are due to the fact that they are setting up Nursing Homes in such centres as Kumasi. These establishments are far more lucrative than Government service, which until 1954 has offered to the male nurse no avenue of promotion beyond Grade I Nurse except to Health Centre Superintendent. This position was rectified during 1954 by the creation of the post of Wardmaster for the Male State Registered Nurse and of Nursing Superintendent for the Male Qualified Registered Nurse. The loss of service of female nurses as a result of pregnancy continues to be extremely serious and to hamper the progress of the Nursing Service. During the latter part of 1954 it became apparent that if there was not sufficient recruitment to the service to produce an appreciable improvement in numbers and to cover loss of service due to pregnancy, it would become necessary to close hospitals or hospital wards. By the end of 1954, however, this situation although anticipated had not yet arisen.

*(f) Health Inspectors**(1) Accra*

The three schools of Hygiene at Accra, Kintampo and Tamale continued their training activities during 1954. At the Accra School 35 pupils were in training, 32 for Government, one for the Accra Municipal Council and 2 for the Kumasi Municipal Council. Three Government and one Kumasi Municipal Council Pupil passed the School's qualifying examination in July.

Eleven candidates sat for the examination of the Royal Sanitary Institute (West Africa) in August 1954. The results were still awaited at the end of the year.

(2) Kintampo

The second batch of students finished their training on 17th June 1954; 29 students took the qualifying examination and all were successful. This brings to 58 the total number who have qualified at the School since its opening. The third batch of 30 students arrived and commenced study in September 1954.

(3) Tamale

Due to the difficulty in obtaining a sufficient number of candidates from the Northern Territories a batch of students from other parts of the Gold Coast was sent to Tamale for training.

(g) Health Visitors

Health Visitors are trained at the School of Hygiene, Accra. The year began with the Health Visitors Qualifying Examination held in January. Four students took this examination, and all passed. Two were State Registered Nurses, and two were Qualified Registered Nurses.

During September, eight students commenced training, consisting of six State Registered and two Qualified Registered Nurses. Of these, one Qualified Registered Nurse was returned to general nursing duties, and one State Registered Nurse resigned from the service.

(h) X-Ray Assistants.

Training has continued during the year at the School for pupil X-Ray assistants. There was no new development to report in 1954.

(i) Laboratory Assistants

At the end of 1954 there were 21 pupils undergoing training at the Medical Research Institute.

(j) Pharmacists

At the end of 1954 there were 25 pupils training in the Pharmaceutical Department of the Kumasi College of Technology and Arts under Government auspices. At the examinations held in January and June for which a total of 36 candidates presented themselves, 18 were successful in obtaining the Certificate of Competency issued by the Gold Coast Pharmacy and Poisons Board.

(k) Leprosy Control Service

Ten pupils were in training at the Ankaful Leprosarium as Leprosy Control Assistants at the end of 1954.

(l) Hospital Welfare Service

Two pupils were in training in Accra for the post of Assistant Hospital Welfare Officer.

CHAPTER XIV

STATUTORY BOARDS

(i) PHARMACY AND POISONS BOARD

The Board met eleven times during the year under review. Its duties included the following matters:—

- (i) The examining of candidates for the Board's Certificate of Competency.
- (ii) Consideration of a draft Pharmacy and Poisons Bill.
- (iii) The holding of disciplinary enquiries in the case of Registered Pharmacists, Pupil Pharmacists, and holders of licences under Part II of the Pharmacy and Poisons Ordinance, 1946 who were convicted of illegal practices during 1954. Four Registered Pharmacists were severely reprimanded and judgment withheld for 12 months, One Pupil Pharmacist was severely reprimanded, and seven holders of Part II licences had their licences revoked by the Board.

(ii) MIDWIVES BOARD

The composition and duties of this Board remained unchanged throughout the year. Four meetings were held; one midwife was suspended for professional misconduct and two were severely censured during 1954.

(iii) NURSES BOARD

The composition and duties of this Board remained unchanged during 1954. Three meetings were held. Four disciplinary cases were heard during the year, two names being removed from the Register of Male Nurses, and one male nurse was suspended from practising nursing for 12 months. These cases involved the unlawful possession of dangerous drugs, and in one case the possession also of syringes.

One male nurse was severely censured for the same offence but his name was not struck off the Register because failing eyesight in any case rendered it impossible for him to nurse.

CHAPTER XV

WORK DONE IN RURAL DRESSING STATIONS

During the year, the current method of obtaining returns of work done in rural dressing stations was reviewed. The form of return was considered unsatisfactory, and action was taken, in consultation with Specialists and Medical Officers generally, to draw up a new return in a form more easily understandable by dressers. This, however, was not available during the year under review. Extracts from the returns received are contained in Return "F".

It will be readily appreciated that the figures provided in Return "F" must be accepted with a degree of reserve. Returning Officers are of widely varying calibre; some are Mission Nursing Sisters, others are Qualified Nurses; but the great majority are dressers who received some elementary training in Government Hospitals. Such training varies with the degree of interest shown by Medical Officers, and the amount of time at the disposal of a Medical Officer for teaching purposes. No standardised form of training for dressers yet exists, but plans aimed at improving their training are under consideration at the time of writing this Report.

With regard to the number of cases treated, there are shown in Return "F" on a regional basis. It will be appreciated that the figures given are purely factual, and can bear very little relation to incidence. The Accra region, for example, contains two dressing stations only, at Dodowa and Prampram. The greatest number of dressing stations are in Ashanti and the Northern Territories, and the majority are not only owned by but operate under the auspices of the various local authorities. In consequence the number in operation in any one region during a given year tends to fluctuate.

The figures do, however, show that there is a very considerable attendance at rural dressing stations (bearing in mind that Return "F" gives only selected extracts from the returns received from such dressing stations). A large proportion of this attendance would otherwise be directed to hospital out-patient clinics, thereby further taxing existing hospital facilities and increasing the already heavy burden carried by Medical Officers. Also, many persons in areas remote from hospitals receive essential treatment at dressing stations which, in the absence of such centres, they might not have been able to receive. The ideal to be aimed at, as recommended in the report of the Commission of Enquiry into the Health Needs of the Gold Coast, is the appointment to each out-station hospital of two medical Officers, one of whom would supervise the work of the dressing stations in the district. During the year under review it has not been possible to consider such an arrangement in any station.

CHAPTER XVI

VISITORS

During 1954, the Ministry had the pleasure of welcoming the following distinguished visitors to the Gold Coast:—

- Sir Eric Pridie, K.C.M.G., O.B.E., D.S.O., F.R.C.P., Chief Medical Officer, Colonial Office.
- Countess of Limerick, O.B.E., Vice-Chairman, British Red Cross Society.
- Professor George Macdonald, C.M.G., M.D., Professor of Tropical Hygiene, London University, and Director of the Ross Institute, Public Health Consultant on the Volta River Project.
- Professor Joseph Gillman, D.Sc., M.B., B.Ch., Professor of Physiology, Medical University of Witwatersrand, South Africa.
- Professor F. R. G. Heaf, M.D., F.R.C.P., Department of Tuberculosis, Welsh National School of Medicine, Tuberculosis Adviser to the Ministry of Health and the Colonial Office.
- Professor F. J. C. Cambournac, Director, African Region, World Health Organisation.
- Dr. F. Hawking, M.R.C.P., National Institute for Medical Research, London. Colonial Medical Research Committee.
- Dr. Frank E. Byron, Ph.D., F.R.I.C., Human Nutrition Unit, London School of Tropical Medicine and Hygiene.
- Dr. Cicely D. Williams, F.R.C.P., Senior Lecturer, Human Nutrition Unit, London School of Hygiene and Tropical Medicine.
- Dr. Andrew Topping, C.M.G., M.D., Dean, London School of Hygiene and Tropical Medicine, Public Health Consultant on Volta River Project.
- Dr. John Logan, D.Sc., Rockefeller Foundation, Public Health Engineering Consultant to Volta River Project.
- Dr. W. S. S. Ladell, M.B., B.Ch., Hot Climate Physiological Laboratory, Oshodi, near Lagos, Nigeria.
- Dr. L. J. Bruce-Chwatt, M.D. (Warsaw), Senior Malariologist, Federation of Nigeria.
- Dr. J. L. McLetchie, O.B.E., M.B., B.Ch., Director of Medical Services, Eastern Region, Nigeria.
- Dr. C. J. Hackett, M.D., F.R.C.P., Wellcome Museum, Adviser on Yaws to World Health Organisation.
- Dr. E. B. Worthington, Ph.D., Secretary-General, Scientific Council for Africa South of the Sahara.
- Dr. J. S. Porterfield, M.B., Ch.B., Virus Institute, Yaba, near Lagos, Nigeria.
- Miss M. Houghton, M.B.E., Chief Education Officer, General Nursing Council for England and Wales.
- Mr. Paul Henry, Secretary-General, Commission for Technical Co-operation in Africa.
- Mr. Karl Borch, U.N.I.C.E.F., Representative for Africa.
-

APPENDIX "A"

(To Chapter I., Vital Statistics)

TABLE I

ESTIMATED AFRICAN POPULATION: MID-1954

(a) GOLD COAST (INCLUDING TOGOLAND UNDER U.K. TRUSTEESHIP)

Region	1948 Census	1954 (Estimated)
Accra	221,921	262,200
Eastern	648,978	692,300
Western	869,756	966,200
Trans-Volta/Togoland	476,761	565,600
Ashanti	817,782	927,800
Northern Territories	1,076,482	1,121,900
Total	4,111,680	4,536,000
(b) TOGOLAND UNDER U.K. TRUSTEESHIP		
Togoland	382,717	422,700

TABLE II

NON-AFRICAN POPULATION OF THE GOLD COAST AT 31ST DECEMBER, 1954

(EXCLUDING VISITORS AND STATUS NOT KNOWN)

Origin	MALES			FEMALES			Sex not Stated	Total
	Adults	Children	Age not Stated	Adults	Children	Age not Stated		
European								
British	4,827	948	26	2,481	740	13	4	9,039
Other European	979	84	2	348	68	—	—	1,481
Asiatic								
Indian/Pakistani	343	41	1	69	33	—	—	487
Syrian/Lebanese	845	31	8	494	34	18	—	1,430
Other Asiatic	4	—	1	2	1	—	—	8
American								
United States	107	24	—	90	27	—	—	248
Other American	7	2	—	11	—	—	—	20
Other Nationalities	2	—	—	—	—	—	—	2
Total	7,114	1,130	38	3,495	903	31	4	12,715

TABLE III
IMMIGRATION INTO THE GOLD COAST OF NON-NATIVES OF WEST AFRICA—1954

Origin	ARRIVALS					DEPARTURES					TOTAL IMMIGRATION				
	Males	Females	Children	Others	Total	Males	Females	Children	Others	Total	Males	Females	Children	Others	Total
EUROPEAN															
(a) British	6,193	2,512	1,570	375	10,650	6,479	2,352	1,437	4	10,272	-286	+160	+133	+371	+378
(b) Other European	1,621	408	198	71	2,298	1,531	318	147	3	1,999	+90	+90	+51	+68	+299
(c) Commonwealth including Eire ...	254	85	31	12	382	276	92	38	—	406	-22	-7	-7	+12	-24
ASIATIC															
(a) Syrian	27	7	1	3	38	23	4	2	—	29	+4	3	-1	+3	+9
(b) Lebanese	247	114	26	35	422	238	99	31	—	368	+9	+15	-5	+35	+54
(c) Other Asiatic	48	2	—	—	50	47	3	1	—	51	+1	-1	-1	—	-1
(d) Indian	181	17	32	3	233	171	7	17	6	201	+10	+10	+15	-3	+32
(e) Pakistani	1	—	1	—	2	4	—	—	—	4	-3	—	+1	—	-2
AMERICAN															
(a) United States	708	216	94	132	1,150	806	217	95	4	1,122	-98	-1	-1	+128	+28
(b) Others	6	10	—	1	17	15	3	2	—	20	-9	+7	-2	+1	-3
Other Nationalities including African and Stateless Persons	28	—	—	—	28	27	1	1	—	29	+1	-1	-1	—	-1
Total	9,314	3,371	1,953	632	15,270	9,617	3,096	1,771	17	14,501	-303	+275	+182	+615	+769

N.B.—"Others" includes visitors, etc.

TABLE IV

OCCUPATION AND NATIONALITY OF RESIDENT MALE EXPATRIATES: 1954

Occupation	British	Other European	Levantine (Lebanese and Syrian)	Asiatics	North and Central Americans	Others	Total
Professional Community	348	9	Nil	11	9	Nil	377
Missionary Community	137	149	2	9	64	2	363
Mining Community	843	78	Nil	1	Nil	Nil	922
Civil Service Community	2,048	33	Nil	1	2	Nil	2,084
Merchant Community	1,365	706	844	322	30	6	3,273
Not stated	—	2	2	—	—	1	5
Not gainfully employed	140	4	5	5	2	—	156
Total	4,881	981	853	349	107	9	7,180

TABLE V

THE GENERAL EUROPEAN POPULATION 1950-54

	1950	1951	1952	1953	1954
Number resident at end of year	6,507	6,742	6,751	7,169	10,520
Number invalided	39	41	40	21	25
Number of deaths	10	14	17	19	25
Number of births	No record available	No record available	No record available	No record available	188

TABLE VI

THE EXPATRIATE NON-EUROPEAN POPULATION: 1954

Nationality	Number resident at end of year	Number of Deaths	Number of Births
<i>Asiatic</i>			
Indian/Pakistani	487	2	10
Syrian/Lebanese	1,430	5	78
Other Asiatic	8	—	—
<i>American</i>			
United States	248	—	5
Other Americans	20	—	—
Other Nationalities	2	2 (West Indians)	2
Total	2,195	9	95

TABLE VII

NATIONALITY OF EXPATRIATES BIRTHS: 1954

<i>British Commonwealth</i>							
Great Britain	..	..	..	..	..	..	151
Union of South Africa	..	..	..	..	..	..	4
Cyprus	..	..	..	..	..	..	1
Malta	..	..	..	..	..	..	1
West Indies	..	..	..	..	..	..	2
India and Pakistan	..	..	..	..	..	..	10
<i>Foreign Nationals</i>							
Irish	..	..	..	..	..	..	3
French	..	..	..	..	..	..	8
Swiss	..	..	..	..	..	..	8
Greek	..	..	..	..	..	..	4
Italian	..	..	..	..	..	..	1
German	..	..	..	..	..	..	1
U.S. Americans	..	..	..	..	..	..	5
Dutch	..	..	..	..	..	..	3
Spanish	..	..	..	..	..	..	1
Polish	..	..	..	..	..	..	1
Russian	..	..	..	..	..	..	1
Lebanese	..	..	..	..	..	..	69
Syrian	..	..	..	..	..	..	9
Total Births							283

TABLE VIII

DISTRIBUTION OF REGISTERED BIRTHS AND DEATHS BY REGIONS: 1954

Region		Population of Region	Number of Registration Areas	Population of Registration Areas	Total Number of Births	Total Number of Deaths
Eastern ...	...	692,300	8	204,057	8,564	4,005
Accra } Western }	...	262,200 966,200	14	152,901	5,836	3,122
Trans-Volta/Togoland	...	565,600	3	22,988	801	535
Ashanti ...	...	927,800	8	111,101	3,670	2,358
Northern Territories	...	1,121,900	4	32,608	731	1,005
Total	...	4,536,000	37	523,655	19,602	11,025
Togoland (U.N.)	...	422,700	1	6,052	259	144

TABLE IX

REGISTERED BIRTHS AND DEATHS BY SEX AND RACIAL ORIGIN—1953-54

BIRTHS							DEATHS					
AFRICAN				NON-AFRICAN			AFRICAN			NON-AFRICAN		
Year	Males	Females	Total	Males	Females	Total	Males	Females	Total	Males	Females	Total
1953 ...	9,047	8,864	17,912	132	137	269	6,133	4,543	10,676	34	10	44
1954 ...	9,881	9,436	19,317	140	143	283	6,371	4,620	10,991	24	10	34

TABLE X

BIRTH, STILL-BIRTH, DEATH, NEONATAL, INFANTILE AND MATERNAL MORTALITY RATES
—1950-54

Year	Live Birth Rate per 1,000 living	Still-birth Rate per 1,000 total live and Still-births	Death Rate per 1,000 living	Neonatal Mortality Rate per 1,000 total Births	Infant Mortality Rate per 1,000 related Births	Maternal Mortality Rate per 1,000 total Births
1950	20.3	78.6	20.0	—	122	—
1951	31.5	85.6	19.3	—	117	—
1952	30.3	78.0	20.3	—	125	—
1953	35.3	73.0	20.8	—	113	—
1954	37.4	78.0	21.1	63	119	21

TABLE XI

BIRTH, STILL-BIRTH, DEATH, NEONATAL, INFANTILE AND MATERNAL MORTALITY
RATES BY REGIONS 1954

Region	Live Birth Rate per 1,000 living	Still-birth Rate per 1,000 total live and Still-births	Death Rate per 1,000 living	Neonatal Mortality Rate per 1,000 related Births	Infant Mortality Rate per 1,000 total Births	Maternal Mortality Rate per 1,000 total Births
Eastern	42.0	52	19.6	62	107	16
Western	38.2	72	20.4	54	110	19
Trans-Volta/Togoland	34.8	84	23.3	74	130	21
Ashanti	33.0	145	21.2	75	134	32
Northern Territories	22.4	77	30.8	81	233	37

TABLE XII

DEATHS (ALL CAUSES) BY AGE AND SEX IN 36 REGISTRATION AREAS—1950-1954

Age Group	1950		1951		1952		1953		1954	
	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
Under 24 hours	76	64	50	55	66	50	135	63	141	111
24 hours—	887	777	910	788	1,010	852	953	910	1,129	947
1—	757	703	836	707	928	861	968	789	1,019	830
5—	367	281	348	322	362	326	334	276	376	323
15—	500	437	527	437	445	401	452	429	457	458
25—	1,842	831	1,643	792	1,726	932	1,705	895	1,735	814
45—	856	352	836	359	773	376	794	342	832	388
65+	684	692	706	684	935	737	826	849	706	759
Total	5,969	4,137	5,856	4,144	6,245	4,535	6,167	4,553	6,395	4,630

TABLE XIII

THE OFFICIAL EUROPEAN POPULATION—1950-54

	1950	1951	1952	1953	1954
Number resident	1,135	1,411	1,581	1,691	* 1,350 † 733 ‡ 2,083
Number invalided	19	16	25	17	15
Number of deaths	4	3	3	4	3

* Pensionable

† Contract

‡ Total

Note—The case of an Army Officer who died from Coronary Thrombosis and Heart failure has not been included for the purposes of this return.

TABLE XIV
CAUSES OF INVALIDING OF EUROPEAN OFFICIALS—1950-54

Intermediate List Number	Cause of Invaliding	NUMBER OF CASES					
		1950	1951	1952	1953	1954	Total
A.1	Tuberculosis of Respiratory System	—	1	1	—	1	3
A.4	Tuberculosis of Bones and Joints	—	—	1	—	—	1
A.12	Typhoid Fever	—	2	—	—	—	2
A.16(B)	Amoebiasis	—	1	—	—	—	1
A.26	Tetanus	—	—	1	—	—	1
A.28	Acute Poliomyelitis	—	—	—	—	—	—
A.30	Late effect of acute Poliomyelitis and acute infectious encephalitis	—	—	—	—	3	3
A.34	Infectious Hepatitis	—	—	—	—	1	1
A.37(E)	Other and unspecified forms of malaria ..	—	—	1	1	—	2
A.40(A)	Onchocerciasis	—	—	1	—	—	1
A.44	Malignant neoplasm of buccal cavity and pharynx	—	—	1	—	—	1
A.48	Malignant neoplasm of rectum	—	—	—	1	—	1
A.60	Benign neoplasms and neoplasms of unspecified nature	—	1	—	—	—	1
A.62	Thyrotoxicosis with or without goitre ..	1	—	—	—	—	1
A.65(C)	Other specified and unspecified anaemias ..	—	1	1	—	—	2
A.66(B)	Other allergic disorders, endocrine, metabolic and blood diseases	2	—	—	—	—	2
A.67	Psychoses	—	1	1	—	2	4
A.68	Psychoneuroses and disorders of personality	6	6	4	7	3	26
A.77(C)	Other inflammatory diseases of the ear ..	—	—	—	1	—	1
A.78(A)	All other diseases and conditions of the eye	1	—	2	—	1	4
A.78(B)	All other diseases of the nervous system and sense organs	—	—	1	—	1	2
A.81	Arteriosclerotic and degenerative heart disease	1	—	—	—	—	1
A.83	Hypertension with heart disease	—	—	1	—	—	1
A.86	Other diseases of the circulatory system ..	1	—	—	—	—	1
A.88	Influenza	—	—	—	1	—	1
A.91	Primary atypical, other and unspecified pneumonia	—	—	—	—	1	1
A.93	Bronchitis, chronic and unqualified	—	1	—	—	—	1
A.95	Empyema and abscess of lung	—	—	1	—	—	1
A.96	Pleurisy	1	—	—	—	—	1
A.97(B)	All other respiratory diseases	—	—	—	1	—	1
A.99	Ulcer of stomach	—	—	—	1	1	2
A.100	Ulcer of duodenum	1	—	—	—	—	1
A.102	Appendicitis	—	—	1	1	—	2
A.106	Cholelithiasis and cholecystitis	1	—	1	—	—	2
A.107	Other diseases of digestive system	—	1	1	—	—	2
A.114(C)	All other diseases of the genito-urinary system	2	—	2	—	—	4
A.121	Infections of skin and subcutaneous tissue	—	—	—	1	—	1
A.122	Arthritis and spondylitis	—	—	—	2	—	2
A.137(B)	Observation without need of further medical care	—	1	—	—	—	1
AE.147(E)	All other accidental causes	2	—	3	—	1	6
	Total	19	16	25	17	15	92
<i>Injuries arising from accidental causes</i>							
AN.138	Fracture of skull	—	—	1	—	—	1
AN.140	Fracture of limb	2	—	1	—	1	4
AN.141	Dislocation without fracture	—	—	1	—	—	1
	Total	2	—	3	—	1	6

TABLE XV
CAUSES OF INVALIDING OF EUROPEAN OFFICIALS

Serial	Diagnosis	Number of Cases
1	Reactive Depression	2
2	Depression and mental retardation with suicidal tendencies	1
3	Manic depressive psychosis	1
4	Frequent and severe headaches for which no organic cause can be found	1
5	Respiratory Tuberculosis	1
6	Muscular weakness of both lower limbs—sequel to an acute febrile illness possibly caused by a neurotropic virus	1
7	Placid paralysis of left buttock, thigh, and leg believed to have been caused by an attack of Poliomyelitis	1
8	Post effects of anterior poliomyelitis	1
9	Tic Doloieux, originating from left gasserian ganglion	1
10	Right spical pneumonia	1
11	Peptic ulcer	1
12	Jaundice and loss of weight	1
13	Fracture of right patella	1
14	Retinal haemorrhage, right eye	1

TABLE XVI
INVALIDING OF NON-OFFICIAL EUROPEANS, 1950-54

Occupation	1950	1951	1952	1953	1954	Total
Merchant Community	1	11	—	1	1	14
Missionaries, male	—	—	—	1	—	1
Missionaries, female	—	—	—	—	—	—
Professional Community	—	—	—	—	—	—
Mining Community	19	14	15	1	9	58
Women (non-official)	—	—	—	1	—	1
Children (general)	—	—	—	—	—	—
Males not gainfully employed	—	—	—	—	—	—
Total	20	25	15	4	10	74

TABLE XVII

CAUSES OF INVALIDING OF NON-OFFICIAL EUROPEANS, 1950-54

Intermediate List Number	Diseases	1950	1951	1952	1953	1954	Total
A.1	Tuberculosis of the Respiratory system ..	—	7	2	—	1	10
A.5	Tuberculosis all other forms	1	—	—	—	—	1
A.12	Typhoid Fever	—	—	1	—	—	1
A.13	Paratyphoid Fever and other salmonella infections	2	—	—	—	—	2
A.28	Acute Poliomyelitis	—	—	—	1	—	1
A.46	Malignant neoplasm of stomach	—	1	—	—	—	1
A.50	Malignant neoplasm trachea, and of bronchus and lung not specified as secondary	—	—	—	—	1	1
A.63	Diabetes Mellitus	1	1	—	—	—	2
A.65(A)	Pernicious and other hyperchromic anaemias ..	1	—	—	—	—	1
A.66(A)	Asthma	—	—	—	1	—	1
A.66(B)	All other allergic disorders, endocrine, metabolic and blood diseases	—	1	—	—	—	1
A.67	Psychoses	—	—	—	1	—	1
A.68	Psychoneuroses and disorders of personality ..	1	1	—	—	1	3
A.81	Arteriosclerotic and degenerative heart disease	1	1	1	—	—	3
A.82	Other diseases of the heart	—	—	—	—	1	1
A.83	Hypertension with heart disease	1	—	—	—	—	1
A.84	Hypertension without mention of heart disease	1	—	—	—	—	1
A.86	Other diseases of circulatory system	—	—	—	—	1	1
A.90	Broncho-pneumonia	1	—	—	—	—	1
A.91	Primary atypical, other and unspecified pneumonia	—	—	1	—	—	1
A.97(A)	Pneumoconiosis	1	—	—	—	—	1
A.97(B)	All other respiratory diseases	—	1	1	—	—	2
A.99	Ulcer of stomach	—	1	1	—	1	3
A.100	Ulcer of duodenum	—	1	—	—	—	1
A.101	Gastritis and Duodenitis	—	1	—	—	—	1
A.103	Intestinal obstruction and hernia	—	1	—	—	—	1
A.107	Other diseases of digestive system	1	3	—	—	2	6
A.114(C)	All other diseases of the genito-urinary system	—	—	1	—	—	1
A.121	Infections of skin and subcutaneous tissue ..	—	1	—	—	—	1
A.122	Arthritis and spondylitis	1	—	3	—	—	4
A.126(B)	All other diseases of the skin	—	—	1	—	1	2
A.137(C)	All other ill-defined causes of morbidity ..	1	—	—	1	1	3
AE.147(E)	All other accidental causes	6	3	3	—	—	12
AE.148	Suicide and self-inflicted injury	—	1	—	—	—	1
	Total	20	25	15	4	10	74

Intermediate List Number	Injuries arising from accidental causes	1950	1951	1952	1953	1954	Total
AN.138	Fracture of skull	1	—	—	—	—	1
AN.139	Fracture of spine and trunk	1	1	—	—	—	2
AN.140	Fracture of limbs	1	—	1	—	—	2
AN.141	Dislocation without fracture	—	1	—	—	—	1
AN.142	Sprains and strains of joints and adjacent muscle	1	—	—	—	—	1
AN.145	Laceration and open wounds	—	1	1	—	—	2
AN.150	All other and unspecified effects of external causes	2	1	1	—	—	4
	Total	6	4	3	—	—	13

TABLE XVIII
CAUSES OF INVALIDING NON-OFFICIAL EUROPEANS, 1954

Serial	Diagnosis	Number of Cases
1	Dermatitis	1
2	Recurrent Phlebitis	1
3	Carcinoma of lungs	1
4	Nervous debility and doubtful paroxysmal tachycardia	1
5	Haemetemesis	1
6	Angina Pectoris	1
7	Pulmonary Tuberculosis	1
8	Pyloric Stenosis	1
9	Peptic Ulcer	1
10	Diagnosis unknown	1
	Total	10

TABLE XIX
INVALIDINGS AND DEATHS IN THE PENSIONABLE OFFICIAL AFRICAN POPULATIONS, 1954

	Senior Civil Servants	Junior Civil Servants	Total
Number resident	1,043	11,918	12,961
Number invalided	Nil	45	45
Number of deaths	Nil	19	19

TABLE XX
INVALIDING OF AFRICAN JUNIOR CIVIL SERVANTS BY DEPARTMENTS, 1954

Ministry or Department	No. of Cases
Gold Coast Railways	12
Gold Coast Police	6
Ministry of Health	5
Posts and Telecommunications	5
Public Works	4
Agriculture	3
Electricity	3
Government Printing	1
Rural Water Development	1
Regional Administration, Ashanti	1
Prisons	1
Commerce	1
Customs	1
Ministry of Trade and Labour	1
Total	45

TABLE XXI

CLASSIFIED CAUSES OF INVALIDING OF AFRICAN OFFICIALS, 1950-54

Intermediate List Number	Diseases	1950	1951	1952	1953	1954	Total
A.1	Tuberculosis of Respiratory system	10	6	14	11	4	45
A.10	All other Syphilis	—	3	1	—	2	6
A.11	Gonococcal infections	—	—	1	—	—	1
A.16(B)	Amoebiasis	—	—	—	1	—	1
A.23	Meningococcal infections	—	1	—	—	—	1
A.37(E)	Other and unspecified Malaria	—	1	—	—	1	2
A.43	Yaws	—	—	—	1	—	1
A.43(M)	Trypanosomiasis	—	—	—	1	—	1
A.44	Malignant neoplasm of buccal cavity and pharynx	1	—	—	—	—	1
A.57	Malignant neoplasm of all other unspecified sites	1	1	—	1	1	4
A.59	Lymphosarcoma and other neoplasms of lymphatic and haematopietic system	—	—	—	—	1	1
A.60	Benign neoplasms and neoplasms of unspecified nature	—	1	—	—	1	2
A.63	Diabetes Mellitus	—	1	—	1	—	2
A.65(B)	Iron deficiency anaemias (hypochromic)	—	1	—	—	—	1
A.65(C)	Other specified and unspecified anaemias	1	—	—	—	—	1
A.66	Asthma	—	1	2	1	—	4
A.67	Psychoses	1	2	—	7	3	13
A.68	Psychoneuroses and disorders of personality	5	3	4	7	4	23
A.70	Vascular lesions affecting central nervous system	—	—	—	3	4	7
A.73	Epilepsy	1	—	—	1	—	2
A.75	Cataract	—	—	1	1	1	3
A.76	Glaucoma	—	—	2	—	1	3
A.77(B)	Otitis media and mastoiditis	1	—	—	—	—	1
A.78(A)	All other diseases and conditions of eye	6	2	3	6	5	22
A.78(B)	All other diseases of the nervous system	4	1	—	1	—	6
A.81	Arteriosclerotic and degenerative heart disease	5	2	2	8	1	18
A.82	Other diseases of heart	—	—	—	—	1	1
A.83	Hypertension with heart diseases	1	1	3	4	—	9
A.84	Hypertension without mention of heart	10	2	8	1	4	25
A.85	Diseases of arteries	2	—	—	—	1	3
A.93	Bronchitis, chronic and unqualified	—	—	—	—	1	1
A.95	Empyema and abscess of lung	—	—	—	—	1	1
A.97(B)	All other respiratory diseases	—	2	1	—	1	4
A.99	Ulcer of stomach	—	—	1	—	1	2
A.103	Intestinal obstruction and hernia	—	1	—	—	—	1
A.105	Cirrhosis of liver	2	—	2	—	1	5
A.106	Cholelithiasis and cholecystitis	—	—	1	—	—	1
A.107	Other diseases of digestive system	1	—	1	—	—	2
A.110	Infection of kidney	—	—	—	1	—	1
A.122	Arthritis and spondylitis	—	2	2	5	—	9
A.126(B)	All other diseases of skin	—	—	—	1	—	1
A.126(C)	All other diseases of musculo-skeletal system	—	1	3	—	3	7
A.136	Senility without mention of psychosis	—	1	1	—	—	2
A.137	All other ill-defined causes of morbidity	2	—	1	—	1	4
AE.147(E)	All other accidental causes	2	2	—	3	1	8
	Total	56	38	54	66	45	259

INJURIES ARISING FROM ACCIDENTAL CAUSES

Intermediate List Number	Diseases	1950	1951	1952	1953	1954	Total
AN.138	Fracture of skull	—	—	—	1	—	1
AN.139	Fracture of spine and trunk	—	—	—	1	—	1
AN.140	Fracture of limb	2	1	—	1	1	5
AN.148	Burns	—	1	—	—	—	1
	Total	2	2	—	3	1	8

TABLE XXII
CAUSES OF INVALIDING OF AFRICAN OFFICIALS, 1954

Serial	Diagnosis	Number of Cases
1	Bilateral Pulmonary Tuberculosis	2
2	Pulmonary Tuberculosis	2
3	Diminished visual acuity due to loss of left eye	1
4	Bilateral optic atrophy due to cerebral arteriosclerosis	1
5	Bilateral cataract and defective vision	1
6	Atrophy of both optic discs with diminished visual acuity	1
7	Blindness of left eye with chronic iritis	1
8	Chronic bilateral primary glaucoma	1
9	Atherosclerosis and presbyopia, not fully corrected	1
10	Hemiplegia due to cerebral thrombosis	1
11	Arteriosclerosis and aortitis	1
12	Cerebral haemorrhage due to hypertension	1
13	Cerebral Arteriosclerosis	1
14	Hypertension	2
15	Essential hypertension with cerebral arteriosclerosis	1
16	Essential hypertension	1
17	Left sided hemiplegia	1
18	Aneurysm of the arch of the aorta	1
19	Aortic aneurysm	1
20	Staphylococcal empyema	1
21	Chronic bronchitis and emphysema	1
22	Fibrosis of lungs	1
23	Residual backache, sequel to lumbar intervertebral lesion	1
24	Chronic backache of unknown aetiology	1
25	Schizophrenia	1
26	Acute confusional insanity	1
27	Reactive depression	1
28	Obsessional neurosis	1
29	Neurosis and chronic tonsillitis	1
30	Sarcoma	1
31	Intra-cranial tumour	1
32	Severe progressive muscular wasting of trunk and arm muscles, resulting from febrile illness of unknown aetiology	1
33	Decalcification of left acromion	1
34	Peptic ulcer	1
35	Cirrhosis of liver	1
36	Deformed left ankle sequel to old fracture	1
37	Gastro-jejunostomy and anxiety state	1
38	Chronic malaria	1
39	Oedema of legs and cardiac enlargement	1
40	Uterine fibroids	1
41	General ill-health of uncertain cause and marked anxiety	1
42	Senile myocarditis and old age	1
	Total	45

TABLE XXIII
SECTION (A) PRINCIPAL CAUSES OF MORTALITY IN GOLD COAST HOSPITALS, 1954

Serial No.	Intermediate List Number	Disease or condition	Number of Deaths
1	A.37(a)-(e)	Malaria—all forms	269
2	A.114(c)	Other diseases of the genito-urinary system	207
3	A.120(a)	Other complications of pregnancy, childbirth and the puerperum	180
4	A.1	Tuberculosis of the respiratory system	165
5	A.90	Broncho-pneumonia	164
6	A.26	Tetanus	121
7	A.82	Other diseases of the heart	92
8	A.103	Intestinal obstruction and hernia	90
9	A.104(a)	Gastro-enteritis and colitis between 4 weeks and 2 years	85
10	A.137(c)	All other ill-defined causes of morbidity	82
11	A.16(A)	Bacillary Dysentery	81
12	A.105	Cirrhosis of liver	76

SECTION (B) MORTALITY FROM PRINCIPAL ACCIDENTAL CAUSES IN GOLD COAST
HOSPITALS, 1954

Serial No.	Intermediate List Number	Nature of accident	Number of Deaths
1	AE.138	Motor vehicle accidents	139
2	AE.159	Other transport accidents	35
3	AE.147(c)	Accidents caused by bites and stings of venomous animals and insects	30
4	AE.143	Accidents caused by fire and explosion of combustible material	23
5	AE.142	Accidents caused by machinery	21
6	AE.141	Accidental falls	18

SECTION (C) MORTALITY FROM INJURIES ARISING FROM ACCIDENTS TREATED IN GOLD
COAST HOSPITALS DURING 1954

Serial No.	Intermediate List Number	Nature of injury	Number of Deaths
1	AN.144	Internal injury of chest, abdomen, and pelvis	55
2	AN.140	Fracture of limbs	50
3	AN.138	Fracture of skull	42
4	AN.150	All other and unspecified effects of external causes ..	41
5	AN.145	Laceration and open wounds	41
6	AN.148	Burns'	32

TABLE XXIV

GROUPED CAUSES OF DEATH IN 36 REGISTRATION AREAS, 1950-54

Year	Deaths from respiratory diseases (excluding Respiratory Tuberculosis) per 1,000 Registered deaths	Deaths from intestinal diseases per 1,000 registered deaths	Deaths from malaria per 1,000 registered deaths	Deaths due to neoplasm per 1,000 registered deaths	Number of deaths due to starvation
1950	101	67	123	—	36
1951	97	83	130	—	13
1952	104	75	141	—	6
1953	110	88	121	—	9
1954	109	90	121	10	—

TABLE XXV

CLASSIFIED CAUSES OF DEATHS FOR EUROPEAN OFFICIALS, 1950-54

Intermediate List Number	Condition	1950	1951	1952	1953	1954	Total
A.28	Acute poliomyelitis	—	—	1	—	—	1
A.71	Nonmeningococcal meningitis	—	—	—	1	—	1
A.81	Arteriosclerotic and degenerative heart disease	1	—	—	1	—	2
A.82	Other diseases of the heart	—	1	—	—	1	2
A.89	Lobar pneumonia	—	—	—	—	1	1
A.95	Empyema and abscess of lung	—	—	1	—	—	1
A.103	Intestinal obstruction and hernia	1	—	—	—	—	1
A.105	Cirrhosis of liver	—	—	—	1	—	1
AE.145	Accident caused by firearm	1	—	—	—	—	1
AE.146	Accidental drowning and submersion	—	—	1	1	—	2
AE.147(E)	All other accidental causes	—	2	—	—	—	2
AE.148	Suicide and self-inflicted injury	—	—	—	—	1	1
	Total	3	3	3	4	3	16

DETAILS FROM INJURY ARISING FROM ACCIDENTAL CAUSES

Intermediate List Number	Condition	1950	1951	1952	1953	1954	Total
AN.138	Fracture of skull	—	1	—	—	1	2
AN.148	Burns	1	—	—	—	—	1
AN.149	Effects of poison	—	1	—	—	—	1
AN.150	All other and unspecified effects of external causes	—	—	1	1	—	2
	Total	1	2	1	1	1	6

TABLE XXVI

CAUSES OF DEATH FOR EUROPEAN OFFICIALS, 1954

Diagnosis	Number of Cases
Suicide—gunshot wound of head	1
Heart Failure	1
Oedema of Lungs after Lobar Pneumonia	1

TABLE XXVII

DEATHS OF NON-OFFICIAL EUROPEANS, 1950-54

Occupation	1950	1951	1952	1953	1954	Total
Merchant Community	2	6	10	12	4	34
Missionaries, male	—	—	—	—	—	—
Professional Community	—	—	—	—	5	5
Mining Community	8	3	4	1	2	18
Women (non-official)	—	—	—	—	1	1
Children (general)	—	2	—	4	9	15
Males not gainfully employed	—	—	—	—	—	—
Total	10	11	14	17	21	73

TABLE XXVIII

CLASSIFIED CAUSES OF DEATH OF NON-OFFICIAL EUROPEANS, 1950-54

Intermediate List Number	Disease	1950	1951	1952	1953	1954	Total
A.21	Diphtheria	—	—	—	—	1	1
A.28	Acute poliomyelitis	—	—	2	—	1	3
A.37 (C)	Falciparum malaria (Malignant tertian) ..	1	—	1	—	1	3
A.37 (D)	Blackwater fever	—	1	—	—	—	1
A.37 (E)	Other and unspecified forms of malaria ..	—	3	1	3	3	10
A.50	Malignant neoplasm of trachea, and of bronchus and lung not specified as secondary ..	—	—	1	—	—	1
A.57	Malignant neoplasm of all other and unspecified sites.	—	—	—	1	—	1
A.65 (A)	Pernicious and other hyperchromic anaemias	—	1	—	—	—	1
A.65 (C)	Other specified and unspecified anaemias ..	—	—	—	1	—	1
A.71	Nonmeningococcal meningitis	—	—	1	—	—	1
A.81	Arteriosclerotic and degenerative heart disease	1	—	2	—	2	5
A.82	Other diseases of heart	—	—	—	—	2	2
A.85	Diseases of arteries	2	1	—	—	—	3
A.90	Broncho-pneumonia	1	—	1	3	—	5
A.91	Primary, atypical, other and unspecified pneumonia	—	1	—	—	1	2
A.93	Bronchitis, chronic and unqualified	—	—	—	1	—	1
A.99	Ulcer of stomach	—	—	1	—	—	1
A.102	Appendicitis	—	—	—	1	—	1
A.104 (A)	Gastro-enteritis and colitis, between four weeks and two years	—	—	—	—	1	1
A.104 (B)	Gastro-enteritis and colitis, ages two years and over	—	—	1	—	—	1
A.105	Cirrhosis of liver	—	—	—	1	—	1
A.107	Other diseases of the digestive system ..	—	—	—	1	1	2
A.112	Hyperplasia of prostate	—	—	—	1	—	1
A.114 (C)	All other diseases of the genito-urinary system	—	—	—	1	—	1
A.131	Post-natal asphyxia and atelectasis	—	—	—	—	1	1
A.135	Ill-defined diseases peculiar to early infancy and immaturity unqualified	—	—	—	—	2	2
A.137 (C)	All other ill-defined causes of morbidity ..	—	—	—	—	4	4
AE.138	Motor vehicle accidents	2	—	—	—	—	2
AE.145	Accidents caused by firearms	—	—	—	1	—	1
AE.147 (E)	All other accidental causes	1	—	1	—	2	4
	Total	8	7	12	15	22	64

NATURE OF INJURY ARISING FROM ACCIDENTAL CAUSES

AN.139	Fracture of spine and trunk	—	2	—	1	—	3
AN.148	Burns	—	—	—	—	2	2
AN.149	Effects of poison	—	1	—	1	—	2
AN.150	All other unspecified effects of external causes	1	1	—	—	—	2
	Total	1	4	—	2	2	9

TABLE XXIX

CAUSES OF DEATH OF NON-OFFICIAL EUROPEANS, 1954

Serial	Diagnosis	Number of Cases
1	Second degree burns, acute toxæmia	1
2	Diagnosis unknown (coroner cases)	3
3	Cerebral malaria	3
4	Asphyxia pallida	1
5	Acute pneumonia, with cardiac failure	1
6	Haematemesis	1
7	Prematurity	2
8	Malignant tertian malaria: cardiac failure	1
9	Acute anterior poliomyelitis	1
10	Laryngo-tracheal diphtheria	1
11	Coronary thrombosis Heart failure	2
12	Congestive heart failure	1
13	Acute right sided dilatation of heart	1
14	Gastro-enteritis	1
15	Shock, and burns	1

TABLE XXX

DEATHS OF OTHER EXPATRIATES, 1954

Occupation	LEVANTINE		ASIATIC		AMERICAN		OTHERS	
	Lebanese	Syrian	Indian/ Pakis- tani	Others	United States	Others	West Indian	Total
Merchant Community	—	—	1	—	—	—	1	2
Professional Community	—	—	—	—	—	—	—	—
Women	1	—	—	—	—	—	—	1
Children	3	1	1	—	—	—	1	6
Total	4	1	2	—	—	—	2	9

TABLE XXXI

CLASSIFIED CAUSES OF DEATH OF NON-EUROPEAN EXPATRIATES, 1954

Intermediate List Number Section A.	Diseases	1953	1954	Total
A.37	Blackwater fever	—	1	1
A.37 (e)	Other and unspecified forms of malaria	1	1	2
A.65 (c)	Other specified and unspecified anaemias	—	1	1
A.70	Vascular lesions affecting central nervous system	1	1	2
A.82	Other diseases of heart	—	2	2
A.104 (a)	Gastro-enteritis and colitis between 4 weeks and 2 years	—	1	1
A.131	Post-natal asphyxia and atelectasis	—	1	1
A.135	Ill-defined diseases peculiar to early infancy and immaturity unqualified	—	1	1
A.117	Haemorrhage of pregnancy and childbirth	1	—	1
A.130	Birth injuries	1	—	1
A.134	All other defined diseases of early infancy	2	—	2
AE.147(e)	All other accidental causes	1	—	1
	Total	7	9	16

Section B.	Nature of Injury arising from accidental cause	1953	1954	Total
A.N.138	Fracture of skull	1	—	1
	Total	1	—	1

TABLE XXXII

CAUSES OF DEATH OF NON-EUROPEAN EXPATRIATES, 1954

Serial	Diagnosis	Number of Cases
1	Malaria	1
2	Cardiac failure	1
3	Severe anaemia, enteritis	1
4	Cerebral haemorrhage; broncho pneumonia	1
5	Blackwater fever	1
6	Gastro-enteritis	1
7	Atelectasis of lungs	1
8	Cardiac failure, emphysema, old age	1
9	Unknown (infant, 6 months)	1

TABLE XXXIII

CAUSES OF DEATH IN EXPATRIATE CHILDREN, 1954

Nationality	Age	Cause of Death
British	1 year 11 months	Second degree burns: acute toxæmia
British	1 year 2 months	Cerebral malaria
British	3 months	Cerebral malaria
British	4 hours	Asphyxia pallida
British	10 months	Acute pneumonia, cardiac failure
British	1 hour	Prematurity
British	6 days	Prematurity
British	2 years	Laryngo-tracheal diphtheria, heart failure
British	10 months	Gastro-enteritis
Syrian	6 months	Unknown
Lebanese	6 months	Malaria
Lebanese	3 months	Cardiac failure
Lebanese	1 year	Severe anaemia, enteritis
West Indian	3 months	Gastro-enteritis
Indian	5 days	Atelectasis of lungs

TABLE XXXIV

CLASSIFIED CAUSES OF DEATH OF AFRICAN OFFICIALS, 1950-54

Intermediate List Number	Diseases	1950	1951	1952	1953	1954	Total
A.1	Tuberculosis of respiratory system	2	—	3	3	1	9
A.12	Typhoid fever	2	—	2	—	1	5
A.13	Paratyphoid fever and other salmonella infections	—	—	—	1	—	1
A.16(B)	Amoebiasis	—	1	—	—	—	1
A.20	Septicaemia and pyaemia	—	—	—	3	—	3
A.26	Tetanus	—	2	1	2	—	5
A.29	Acute infectious encephalitis	—	—	—	2	—	2
A.33	Yellow fever	—	1	1	—	—	2
A.37(C)	Falciparum malaria (malignant tertian) ..	—	—	—	1	—	1
A.37(D)	Blackwater fever	—	—	—	—	1	1
A.37(E)	Other and unspecified malaria	—	—	—	1	—	1
A.43(M)	Trypanosomiasis gambiense	—	—	—	2	—	2
A.45	Malignant neoplasm of oesophagus	—	—	—	1	—	1
A.47	Malignant neoplasm of intestines except rectum	—	—	—	—	1	1
A.57	Malignant neoplasm of all other and unspecified sites	1	—	—	1	2	4
A.63	Diabetes mellitus	2	1	—	1	—	4
A.64(D)	Other deficiency states	1	—	—	—	—	1
A.65(B)	Iron deficiency anaemias (hypochromic) ..	—	—	1	—	—	1
A.65(C)	Other specified and unspecified anaemias ..	—	—	1	—	—	1
A.66	Asthma	—	—	1	—	—	1
(A.66B)	All other allergic disorders, endocrine, metabolic and blood diseases	—	—	—	—	1	1
A.70	Vascular lesions affecting central nervous system	2	1	4	4	3	14
A.71	Nonmeningococcal meningitis	—	—	—	1	—	1
A.81	Arteriosclerotic and degenerative heart disease	—	3	2	1	—	6
A.83	Hypertension with heart disease	—	—	—	1	1	2
A.84	Hypertension without mention of heart ..	1	2	—	—	1	4
A.89	Lobar pneumonia	2	—	1	—	—	3
A.91	Primary, atypical, other and unspecified pneumonia	1	—	—	1	—	2
A.96	Pleurisy	—	—	—	1	—	1
A.97(B)	All other respiratory diseases	—	—	—	1	—	1
A.102	Appendicitis	—	—	—	1	—	1
A.103	Intestinal obstruction and hernia	—	1	—	—	—	1
A.105	Cirrhosis of liver	—	—	—	1	—	1
A.107	Other diseases of digestive system	4	1	—	—	3	8
A.109	Chronic, other, and unspecified nephritis ..	2	—	2	1	1	6
A.112	Hyperplasia of prostate	1	—	—	—	—	1
A.114(C)	All other diseases of genito-urinary system ..	—	—	—	1	1	2
A.120(A)	Other complications of pregnancy, childbirth and puerperium	—	—	1	—	—	1
AE.138	Motor vehicle accidents	—	—	3	—	—	3
AE.147(C)	All other accidental causes	3	—	—	2	1	6
AE.148	Suicide and self inflicted injury	—	—	—	—	1	1
	Total	24	13	23	34	19	116

SECTION B—DEATHS FROM INJURY ARISING FROM ACCIDENTAL CAUSES

Intermediate List Number	Diseases	1950	1951	1952	1953	1954	Total
AN.138	Fracture of skull	—	—	—	1	—	1
AN.140	Fracture of limbs	—	—	—	—	1	1
AN.144	Internal injury of chest, abdomen and pelvis ..	1	—	2	1	1	5
AN.149	Effect of poisons	—	—	1	—	—	1
AN.150	All other and unspecified effects of external causes	2	—	—	—	—	2
	Total	3	—	3	2	2	10

TABLE XXXV

CAUSES OF DEATH OF AFRICAN OFFICIALS, 1954

Serial	Diagnosis	Number of Cases
1	Compound fracture of left leg with suppurative arthritis of ankle and knee joints	1
2	Toxaemia following stab wounds of abdomen (self-inflicted)	1
3	Malignant endothelioma of pleura	1
4	Carcinomatosis	1
5	Malignant neoplasm of colon	1
6	Malignant hypertension	1
7	Hypertension and cardiac failure	1
8	Chronic nephritis	1
9	Uraemia and myocardial failure	1
10	General peritonitis	1
11	Stomach trouble (died in bush, not seen by doctor)	1
12	Hepatitis	1
13	Pulmonary tuberculosis	1
14	Sickle-cell disease	1
15	Enteric fever	1
16	Blackwater fever	1
17	Cerebral haemorrhage	3

TABLE XXXVI

MATERNAL MORTALITY RATES, GOLD COAST, 1950-54

Year	Registered Maternal Deaths	Maternal Mortality per 1,000 Total Births
1950	356	22.1
1951	397	23.1
1952	315	18.0
1953	372	19.0
1954	439	21.0

TABLE XXXVII

MATERNAL MORTALITY RATES BY REGIONS COMPARED WITH THE GOLD COAST RATE, 1954

Gold Coast	21.0
Eastern Region	16.0
Western Region	19.0
Ashanti	32.0
Trans-Volta/Togoland	21.0
Northern Territories	37.0
Togoland (U.N.)	27.0

TABLE XXXVIII

RETURNS OF NOTIFIABLE DISEASES

Disease	Cases	Deaths
Trypanosomiasis	5	2
Plague	0	0
Cholera	0	0
Yellow Fever	2	1
Typhus Fever	0	0
Smallpox	36	2
Dysentery (All)	1,527	119
Cerebro-spinal meningitis	117	48
Acute poliomyelitis	14	1
Influenza	83	0
Pneumonia (All forms)	1,661	271
Typhoid fever	357	14
Pulmonary tuberculosis	1,190	175

TABLE XXXIX

SECTION A: CLASSIFIED PRINCIPAL CAUSES OF MORBIDITY IN GOLD COAST HOSPITAL:
1954

Serial No.	Intermediate List Number	Disease or condition	Number of Cases
1	A 37(a) to (e)	Malaria—all forms	7,004
2	A 120(a)	Other complications of pregnancy, childbirth and puerperium	3,198
3	AN 145	Laceration and open wounds	2,772
4	A 103	Intestinal obstruction and hernia	2,423
5	A 118	Abortion without mention of sepsis	2,141
6	A 114(c)	All other diseases of the genito-urinary system	1,894
7	A N 140	Fracture of limbs	1,766
8	A N 146	Superficial injury, contusion and crushing with intact skin surface	1,755
9	A 126(a)	Chronic ulcer of skin (including tropical ulcer)	1,431
10	A 126(b)	All other diseases of skin	1,400
11	A 44-57	Malignant neoplasms	1,261
12	A 1	Tuberculosis of respiratory system	1,213
13	A 107	Other diseases of the digestive system	1,083
14	A 121	Infections of skin and subcutaneous tissue	1,055
15	A 91	Primary atypical, other, and unspecified pneumonia	1,044

SECTION B: MORBIDITY FROM VARIOUS CAUSES ATTRIBUTABLE TO EXTERNAL
VIOLENCE: 1954

Serial No.	Intermediate List Number	Accidental or violent cause	Number of Cases
1	A E 138	Motor vehicle accidents	2,867
2	A E 147(e)	All other accidental causes	1,548
3	A E 139	Other transport accidents	1,171
4	A E.141	Accidental falls	859
5	A.E.149	Homicide and injury purposely inflicted by other persons	826
6	A.E.147(c)	Accidents caused by bites and stings of venomous animals and insects	575
7	A.E.142	Accidents caused by machinery	513
8	A.E.144	Accidents caused by hot substance, corrosive liquid, steam and radiation	368
9	A.E.145	Accidents caused by firearm	339

APPENDIX "B"

(To Chapter II—General Epidemiology)

TABLE XL

REGISTERED DEATHS DUE TO RESPIRATORY TUBERCULOSIS—1950-54

Year	Number of Deaths	Death rate per 1,000 deaths registered
1950	747	73·0
1951	759	72·0
1952	694	64·0
1953	674	63·0
1954	665	60·0

TABLE XLI
HOSPITAL DEATHS DUE TO RESPIRATORY TUBERCULOSIS PER 1,000 TOTAL HOSPITAL
DEATHS 1950-54

Year	Total number of deaths occurring	Number of deaths from Pulmonary Tuberculosis	Proportional Mortality Rate
1950	3,150	203	64·4
1951	3,068	149	48·6
1952	2,947	189	64·1
1953	3,153	132	41·9
1954	3,423	165	48·2

TABLE XLII
RESPIRATORY TUBERCULOSIS BY OCCUPATION: 1954

[illegible]

TABLE XLIII

TYPES OF NON-RESPIRATORY TUBERCULOSIS TREATED IN 1954

Types of Tuberculosis	IN-PATIENTS						OUT-PATIENTS		
	Male		Female		Total		Male	Female	Total
	Cases	Death	Cases	Death	Cases	Death			
Meninges and Central Nervous System	18	5	13	4	31	9	40	16	56
Intestines, Peritoneum and mesenteric glands	38	11	27	6	65	17	35	21	56
Bones and joints	66	—	28	—	94	—	140	82	222
All other forms	84	11	53	5	137	16	634	338	972
Total	206	27	121	15	327	42	849	457	1,306

TABLE XLIV

SPECIAL DISEASES CLINIC—TAKORADI: 1954

RETURN OF WORK DONE

Disease	Male	Female	CHILDREN		Total
			Male	Female	
Gonorrhoea	4,561	14	8	6	4,589
Syphilis	18	4	—	—	22
Soft Sore	42	1	—	—	43
Lymphogranuloma	55	—	—	—	55
Urinary diseases	229	13	26	10	278
Yaws	26	18	97	74	215
Skin diseases	13	—	—	—	13
Bilharzia	19	—	—	—	19
Total	4,963	50	131	90	5,234

New cases seen 5,404

Daily attendance 7,497

Total attendance 12,901

TABLE XLV

INCIDENCE OF MALARIA DIAGNOSED AT GOLD COAST HOSPITAL, 1954

Type of Malaria	IN-PATIENTS		Out-Patients
	Cases	Deaths	
Benign Tertian	555	26	2,546
Malignant Tertian	2,145	82	11,488
Quartan	430	2	1,389
Unclassified	3,729	156	42,638
Total	6,859	266	58,061
Blackwater Fever	45	3	17

TABLE XLVI

INCIDENCE OF RESPIRATORY INFECTIONS DIAGNOSED AT
GOLD COAST HOSPITALS, 1954

Diseases	IN-PATIENTS		Out-patients
	Cases	Deaths	
Lobar Pneumonia	940	56	629
Broncho Pneumonia	748	164	1,170
Primary Atypical, other and Unspecified Pneumonia ..	1,044	70	1,124
Acute Bronchitis	616	9	5,721
Bronchitis Chronic and Unqualified	467	3	5,623
Empyema and Lung Abscess	62	13	51
Pleurisy	234	9	291
Pneumoconiosis	144	5	172

TABLE XLVII

REGIONAL DISTRIBUTION OF YAWS CASES SEEN AT HOSPITALS: 1954

	Region	1954
Accra		978
Eastern		12,260
Western		16,056
Trans-Volta/Togoland		3,314
Ashanti		6,112
Northern Territories		12,359
Total		51,079

TABLE XLVIII

HOSPITALS RETURNING THE GREATEST NUMBER OF YAWS CASES TREATED,
IN-PATIENT AND OUT-PATIENT TOGETHER: 1954

Hospital	Number of Cases
Oda	5,800
Yendi	4,566
Saltpond	3,758
Dunkwa	3,037
Cape Coast	2,650
Sekondi	2,628
Nsawam	2,415
Tamale	2,104

TABLE XLIX
SITES OF MALIGNANT NEOPLASMS—1953-54

Nature and site of Malignant neoplasms	1953		1954	
	Number of Cases	Number of Deaths	Number of Cases	Number of Deaths
Buccal cavity and pharynx	10	0	12	3
Oesophagus	6	2	5	0
Stomach	53	7	68	14
Intestines, except rectum	14	0	29	1
Rectum	28	1	121	2
Larynx	1	0	4	0
Trachea, Bronchus, and lung not specified as secondary	8	1	27	3
Breast	19	0	31	2
Cervix Uteri	94	2	254	4
Other and unspecified parts of uterus	115	5	199	18
Prostate	49	0	36	3
Bone and connective tissue	51	0	81	2
Skin	47	2	186	1
All other and unspecified sites	212	15	177	18
Total	707	35	1,230	71

TABLE L

INCIDENCE OF NUTRITIONAL DISEASES TREATED AS IN-PATIENTS IN HOSPITALS, 1953-54

	Beriberi		Pellagra		Scurvy		Others		Total	
	1953	1954	1953	1954	1953	1954	1953	1954	1953	1954
Number of cases treated	24	29	112	68	8	7	477	425	621	529
Number of deaths	3	5	15	2	0	0	44	40	62	47

TABLE LI

SEX DISTRIBUTION OF ANAEMIAS TREATED (IN-PATIENT AND OUT-PATIENT) 1954

Type of Anaemia	MALES		FEMALES		TOTAL	
	Cases	Deaths	Cases	Deaths	Cases	Deaths
Hyperchromic anaemia	110	3	79	5	189	8
Hypochromic anaemia	320	5	561	20	881	25
Other and unspecified anaemia	1,320	32	1,434	27	2,754	59
Total	1,750	40	2,074	52	3,824	92

APPENDIX "C"

(To Chapter III—General Hospital Services)

TABLE LII

ANALYSIS OF HOSPITAL RETURNS BY REGIONS—1954

Region	IN-PATIENTS						OUT-PATIENTS			
	ADMISSIONS		DISCHARGES		DEATHS		NEW CASES		TOTAL ATTENDANCE	
	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
Accra ...	4,922	6,432	4,203	6,245	398	196	45,002	36,144	78,964	66,247
Eastern ...	3,700	3,521	3,399	3,280	91	93	40,203	25,375	78,014	59,686
Western ...	7,940	6,129	7,525	5,853	331	261	62,033	31,566	157,423	103,084
Trans-Volta/ Togoland ...	2,069	2,239	2,018	2,162	90	76	16,008	16,241	28,100	33,041
Ashanti ...	4,877	5,949	4,760	5,625	235	215	56,918	33,065	144,622	80,062
Northern Territories ...	5,528	3,484	5,166	3,205	342	228	40,513	26,715	187,743	153,151
Total ...	29,036	27,754	27,071	26,370	1,487	1,069	198,674	169,106	674,866	495,271

TABLE LIII

ATTENDANCES AT HOSPITALS OF CHILDREN UNDER 16, 1954

Region	IN-PATIENTS			NEW OUT-PATIENTS		
	Total number	Children under 16 years	% age of children to total in-patients	Total number	Children under 16 years	% age of children to total out-patients
Accra ...	6,525	1,309	20.06	52,873	10,401	19.67
Eastern ...	6,055	1,033	17.06	60,989	9,129	14.97
Western ...	9,837	1,337	13.59	59,707	12,685	21.24
Trans-Volta/Togoland ...	4,804	1,264	26.31	29,026	9,353	32.22
Ashanti ...	11,394	1,382	12.13	61,022	12,207	20.00
Northern Territories ...	4,855	1,896	39.05	36,455	16,074	44.09
Total ...	43,470	8,221	18.91 (G.C.)	300,072	69,849	23.28 (G.C.)

TABLE LIV

BED-STRENGTH OF GOVERNMENT HOSPITALS BY REGIONS: 1953-54

Region	Male Beds		Female Beds		Cots		Isolation Beds		Estimated Population
	1953	1954	1953	1954	1953	1954	1953	1954	
Accra ..	196	196	197	197	130	148	8	8	262,200
Eastern ..	114	120	62	87	39	41	—	—	692,300
Western ..	310	308	186	184	64	76	—	—	966,200
Trans-Volta/Togoland ..	65	65	62	62	32	32	—	—	565,600
Ashanti ..	153	105	111	112	66	54	—	—	927,800
Northern Territories ..	171	268	126	125	42	56	12	4	1,121,900
Total ..	1,009	1,059	760	767	373	407	20	12	4,536,000

TABLE LV

BEDS AVAILABLE FOR HIGHER SOCIAL GRADES IN GOVERNMENT HOSPITALS 1953-54

Hospitals	MALE BEDS		FEMALE BEDS		COTS		ISOLATION BEDS	
	1953	1954	1953	1954	1953	1954	1953	1954
Ridge, Accra	20	19	17	19	6	7	0	2
Ridge, Takoradi	33	33	12	11	7	7	0	0
North Wing, Kumasi	7	8	7	8	4	4	0	0
West Tamale	4	4	4	4	1	1	0	0

APPENDIX "D"

(to Chapter V, General Public Health)

TABLE LVI

TOTAL ANNUALLY RECURRENT EXPENDITURE OF MINISTRY OF HEALTH COMPARED WITH TOTAL ANNUALLY RECURRENT GOVERNMENT EXPENDITURE: 1950-54

Year	GOVERNMENT EXPENDITURE		MINISTRY OF HEALTH EXPENDITURE		Ministry of Health as percentage of Total
	Ordinary	Extraordinary	Ordinary	Extraordinary	
1950	£ 10,902,214	£ 3,110,391	£ 936,927	£ 28,093	6.9
1951	30,383,419	2,520,604	1,027,166	10,628	3.15
1952	36,121,713	1,008,756	1,585,219	22,325	4.2
1953	40,816,020	2,620,472	1,801,596	17,001	4.2
1954	75,861,847	1,516,986	1,856,127	59,971	2.47

TABLE LVII

SLAUGHTER-HOUSE RETURNS—1954

Region	NUMBER AND TYPE OF ANIMAL SLAUGHTERED			
	Cattle	Sheep	Goats	Pigs
Accra	8,308	12,152	4,593	6,299
Eastern	7,018	8,726	19,826	2,628
Western	5,446	11,574	18,799	3,811
Trans-Volta/Togoland	4,826	10,752	10,061	5,601
Ashanti	27,987	20,009	22,332	1,467
Northern Territories	9,181	13,662	16,612	449
Total	72,766	76,875	92,223	20,255

TABLE LVIII

NUMBER OF CASES OF CEREBRO-SPINAL MENINGITIS NOTIFIED MONTHLY, 1953-54

Month	Total number notified in 1953	NOTIFICATIONS IN 1954			
		Total number	Northern Territories	Ashanti	Eastern/Western T.V.T./Region
January	67	11	9	2	—
February	97	31	30	1	—
March	27	45	20	3	22
April	7	11	3	6	2
May	3	6	4	1	1
June	—	5	1	3	1
July	—	2	—	1	1
August	6	7	2	1	4
September	3	3	1	1	1
October	—	4	1	1	2
November	5	1	—	—	1
December	20	8	5	—	3
Total	235	134	76	20	38

TABLE LIX

RAINFALL RETURNS, 1954

Meteorological Station	Jan.	Feb.	Mar.	April	May	June
Navrongo	0.00	0.05	2.06	1.91	5.43	5.48
Tamale	0.00	0.69	0.15	6.13	5.94	5.39
Yendi	0.05	0.00	2.40	3.48	6.83	5.68
Wa	0.00	0.76	0.98	2.37	4.81	3.73
Bawku	0.00	0.00	0.85	1.11	3.80	4.08
Wenchi	0.20	1.98	3.99	6.13	7.12	6.19
Kete Krachi	1.10	0.99	0.89	4.13	2.61	8.85
Hohoe	0.60	3.96	9.25	5.82	7.72	7.89
Bekwai	2.65	0.95	7.67	7.53	7.86	11.15

	July	August	Sept.	October	Nov.	Dec.	Total	Remarks
Navrongo	8.30	10.36	4.90	2.72	0.46	0.00	41.67	N.Ts.
Tamale	3.46	2.76	6.48	4.51	0.39	0.00	36.59	N.Ts.
Yendi	2.18	6.69	13.26	7.38	0.64	0.00	48.59	N.Ts.
Wa	4.07	6.46	7.54	4.85	0.92	0.00	36.49	N.Ts.
Bawku	4.86	6.16	2.85	3.00	0.14	0.65	27.60	N.Ts.
Wenchi	7.15	0.96	6.34	13.59	2.20	0.04	55.86	North-West Ashanti.
Kete Krachi	4.83	5.54	3.45	7.22	25.5	0.01	42.27	Togoland.
Hohoe	2.22	5.25	9.06	10.02	5.03	2.35	70.17	Togoland.
Bekwai	0.70	0.37	7.30	14.84	4.37	1.40	60.22	South Ashanti.

TABLE LX

MAIN INFECTED DISTRICTS—CEREBRO-SPINAL MENINGITIS, 1954

District	Region	Cases
Eastern Dagomba	Northern Territories	27
Kusasi	Northern Territories	19
Hohoe	Togoland (U.N.)	19
Navrongo	Northern Territories	13
Bekwai	Ashanti	10

TABLE LXI

NOTIFICATION OF CASES AND DEATHS FOR CEREBRO-SPINAL MENINGITIS BY AGE, 1954

Age Group	NUMBER OF CASES			NUMBER OF DEATHS			Total No. of Cases	Total No. of Deaths
	N.Ts.	Ashanti	Western Eastern T.V.T.	N.Ts.	Ashanti	Western Eastern T.V.T.		
0—	1	1	1	—	—	—	3	—
1—	6	3	1	—	—	—	10	—
5—	12	6	3	2	2	1	21	5
10—	10	2	7	1	—	5	19	6
15—	8	4	4	—	2	2	16	4
20—	11	1	—	1	—	—	12	1
25—	6	1	1	2	—	1	8	3
30—	5	—	1	2	—	—	6	2
35—	5	—	1	—	—	1	6	1
40—	2	—	—	1	—	—	2	1
45—	4	—	1	—	—	—	5	—
50+	1	1	—	—	1	—	2	1
Unknown	5	1	18	2	—	—	24	2
Total	76	20	38	11	5	10	134	26

TABLE LXII

MONTHLY NOTIFICATIONS OF SMALLPOX BY REGIONS, 1954

Month	Western	Eastern	Trans-Volta/ Togoland	Ashanti	Northern Territories	Accra	Total
January	1	—	2	7	—	—	10
February	6	—	—	2	1	1	10
March	—	2	—	4	—	1	7
April	—	—	—	4	—	—	4
May	—	—	2	—	—	—	2
June	1	—	—	—	3	6	10
July	3	4	—	1	2	—	10
August	7	—	—	11	—	1	19
September	—	2	—	1	—	—	3
October	1	2	—	1	—	—	4
November	—	—	—	—	—	—	—
December	—	—	—	—	—	—	—
Total	19	10	4	31	6	9	79

TABLE LXIII

MAIN INFECTED CENTRES—SMALLPOX, 1954

Centre	Number of Cases	Number of Deaths
Accra	9	2
Kumasi	7	1

TABLE LXIV
INCIDENCE OF SMALLPOX, 1954, BY POLITICAL REGIONS AND DISTRICTS

Month	ACCRA			EASTERN			WESTERN					ASHANTI				T.V.T.			NORTHERN TERRITORIES				Total
	Accra	Oda	Mpraeso	Nsawam	Dunkwa	Wiaso	Axim	Tarkwa	Cape Coast	Wenchi	Ashanti Akim	Kumasi	Bekwai	Obuasi	Hohoe	Keta	Wa	Tamale	Nanumba	Salaga			
January	—	—	—	—	1	—	—	—	—	2	2	3	—	—	2	—	—	—	—	—	10		
February	1	—	—	—	—	1	5	—	—	—	—	—	2	—	—	—	1	—	—	—	10		
March	1	2	—	—	—	—	—	—	—	—	—	2	2	—	—	—	—	—	—	—	7		
April	—	—	—	—	—	—	—	—	—	—	2	2	—	—	—	—	—	—	—	—	4		
May	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	—	—	—	—	2		
June	6	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	2	1	—	10		
July	—	2	2	—	—	—	—	3	—	—	—	1	—	—	—	—	—	—	—	2	10		
August	1	—	—	—	1	—	5	—	1	—	—	11	—	—	—	—	—	—	—	—	19		
September	—	—	—	2	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	3		
October	—	2	—	—	—	—	—	1	—	—	—	—	—	1	—	—	—	—	—	—	4		
November	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
December	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
Total	9	6	2	2	3	1	10	4	1	2	4	19	5	1	2	2	1	2	1	2	79		

APPENDIX "E"

(To Chapter VI, Medical Field Units)

TABLE LXV

TRYPANOSOMIASIS DIAGNOSED IN FIELD SURVEYS BY MEDICAL FIELD UNITS, 1954

M.F.U. Region	Persons seen	No. of Cases	Percentage	Deaths
North-West	36,699	13	0·03	—
North-East	96,252	8	0·0083	—
Ashanti	79,590	173	0·22	2
Southern Togoland	23,593	19	0·081	—
Grand Total	236,134	213	0·092	2

TABLE LXVI

TRYPANOSOMIASIS DIAGNOSED AT FIXED CENTRES BY MEDICAL FIELD UNITS, 1954

M.F.U. Region	Cases in which Trypanosomiasis was found	Cases in which Trypanosomiasis was not found	Total	Deaths
North-West	57	70	127	—
North-East	97	38	135	3
Ashanti	105	412	517	12
Southern Togoland	—	—	—	—
Grand Total	259	520	779	15

TABLE LXVII

DIAGNOSIS OF TRYPANOSOMIASIS BY ALL SECTIONS OF MEDICAL FIELD UNITS, 1954

Sections	TRYPANOSOMES FOUND IN				Cases diagnosed in the absence of Trypanosomes
	Blood and glands	Blood only	Glands only	Cerebro-spinal fluid	
Ashanti Field Survey	75	69	30	—	8
North-East Field Survey	3	2	3	—	—
North-West Field Survey	7	3	1	—	—
Southern Togoland	13	—	6	—	—
Ashanti Fixed Centres	13	33	53	33	412
North-East Fixed Centres	—	69	39	8	7
North-West Fixed Centres	—	49	35	6	28
Southern Togoland	—	—	—	—	—
Total	111	225	167	47	455

TABLE LXVIII

YAWS CASES DIAGNOSED IN FIELD SURVEYS BY MEDICAL FIELD UNITS, 1954

M.F.U. Region	No. Examined	No. of Yaws Cases	Percentage
North-west	36,699	1,584	4.32
North-east	138,838	9,387	6.76
Ashanti	77,658	2,466	3.18
Southern Togoland	23,593	3,882	16.45
Total	276,788	17,319	6.26

TABLE LXIX

YAWS CASES IN FOLLOW UP OF FIELD SURVEYS BY MEDICAL FIELD UNITS, 1954

Region	Population on Survey *	CASES ON SURVEY			CASES ON FOLLOW UP		
		1 and 2	3	Total	1 and 2	3	Total
North-west	—	—	—	—	—	—	—
North-east	9,974	—	—	123	—	—	95
Yaws Campaign	24,751	2,131	1,158	3,289	967	1,016	1,983
† Ashanti	18,442	392	172	564	222	47	269
Togoland	10,173	—	—	—	—	—	155
Total	63,340	2,523	1,330	3,976	1,189	1,063	2,502

* 1, 2, and 3 refer to Primary, Secondary and Tertiary Yaws.

† Treatment of cases only, for most of the year.

TABLE LXX

YAWS IN EASTERN DAGOMBA (YAWS CAMPAIGN) 1954

No. of villages	No. of names written	No. examined	No. of absentees	No. of cases	No. of cases treated	Number I and II	Number III	Number Latent and Contact
358	42,596	41,845	751	7,708	7,706	3,637	4,069	5,640

The following Local Councils were surveyed:
Mion, Nanumba and part of Yendi.

TABLE LXXI

YAWS IN EASTERN DAGOMBA (YAWS CAMPAIGN) FOLLOW UP, 1954

No. of villages	No. of Survey Populace	DATE AND 1ST TREATMENT			Total	DATE AND 1ST FOLLOW-UP AND TREATMENT			Total
			I and II	III			I and II	III	
175	24,751	11th Nov. 53 to 30th April, 54	2,131	1,158	3,289	8th June to 31st Dec., 54	967	1,016	1,983

The follow-up was done in part of Nanumba and part of Mion Local Councils.

TABLE LXXII

LEPROSY CASES DIAGNOSED ON SURVEY BY THE MEDICAL FIELD UNITS, 1954

Region	Numbers Examined	Number of Cases	Percentage
North-west	36,699	1,138	3.1
North-east	96,252	1,372	1.42
Ashanti	77,658	591	0.76
Southern Togoland	23,593	481	2.03
Total	234,202	3,582	1.53

TABLE LXXIII

LEPROSY CASES TREATED AT FIXED CENTRES BY THE MEDICAL FIELD UNITS, 1954

M.F.U. Region	Cases at 1st Jan., 1954	New cases enrolled in 1954	Cases discharged	Deaths	Cases left transferred or dismissed	Cases under treatment at 31st Dec., 1954
North-west excluding Wa ..	153	89	—	—	25	217
North-east excluding Yendi	73	120	—	—	—	193
Ashanti	348	222	19	3	34	514
Southern Togoland	Clinic opened Jan., 1954	49	—	—	6	43
Total	574	480	19	3	65	967

TABLE LXXIV

ONCHOCERCIASIS FOUND ON FIELD SURVEY BY THE MEDICAL FIELD UNITS, 1954

Region	Examined	Cases	Percentage
North-west	25,945	6,012	23.2
North-east	15,809	3,430	21.7
Ashanti	7,507	1,209	16.1
Togoland	2,608	388	14.9
Total	51,869	11,039	21.3

TABLE LXXV

GUINEAWORM FOUND ON FIELD SURVEY BY THE MEDICAL
FIELD UNITS, 1954

Region						Examined	Cases
North-west	..	..	..	..	..	36,699	636
North-east	..	..	..	..	..	96,252	1,225
Ashanti	..	..	..	..	..	77,658	179
Togoland	..	..	..	..	..	23,593	181
Total	..	..	..	..	..	234,202	2,221

TABLE LXXVI

BILHARZIA FOUND ON FIELD SURVEY BY THE MEDICAL
FIELD UNITS, 1954

S. HAEMATOBIMUM INFECTIONS

Region						Examined	Positive	Percentage
North-west	..	..	..	..	..	951	145	15.2
North-east	..	..	..	..	..	3,990	3	0.08
Ashanti	..	..	..	..	..	2,840	274	9.65
Togoland	..	..	..	..	..	783	259	33.1

TABLE LXXVII

BILHARZIA FOUND IN SCHOOL SURVEYS, CONDUCTED BY
MEDICAL FIELD UNITS, 1954

Region						Examined	S. haematobium		S. mansoni	
							(Urine)		Stool	Urine
North-west	..	..	..	..	..	1,002	354		0*	0
North-east	..	..	..	..	..	1,864	346		42	3
Total	..	..	..	..	..	2,866	700		42	3

* A nil return. Stool examinations were done in all cases.

TABLE LXXVIII

VACCINATION BY MEDICAL FIELD UNITS, 1954

Region						* Vaccinations performed	Known successful
North-west	..	..	..	..	..	27,231	18,477
North-east	..	..	..	..	..	76,929	38,726
Ashanti	..	..	..	..	..	77,658	9,098 *
Togoland	..	..	..	..	..	24,564	†
Total	..	..	..	..	..	206,382	66,301

* A system of recording simply primary or revaccination was used for part of the year.

† Results not assessed.

APPENDIX " F "

(to Chapter VII, Laboratory Services)

(i) BIOCHEMISTRY DIVISION

TOTAL TESTS PERFORMED IN 1954

Blood

Sugar	261
Urea	331
Bilirubin	198
Cholesterol	37
Chlorides	11
Sodium	4
Calcium	23
Proteins	229
Alkaline phosphates	108
Acid phosphates	5
Inorganic phosphate	3
Thymol turbidity	188
Iodine test	42
Amylase	6
Formol Gel	5
Keto acid	2
Alkali reserve	1
	1,454

Function tests

Glucose tolerance	24
Urea clearance	27
Urea Concentration	26
Bromsulphthalein	53
Gastric analysis	43
	173

C.S.F.

Cells	
Chlorides	
Proteins	
Sugar	314

Urine

Chlorides	11
Glucose	79
Diastase	2
Urea	2
Acetone	78
Urobilin	47
Bilirubin	5
Proteins	2
Porphyrins	4
Spectroscopic exams	4
Other tests	6
	240

Faeces

Fats	5
Bilirubin	1
	6

Pleural and Ascitic

Fluids	60
----------------	----

<i>Pregnancy tests</i>	928
--------------------------------	-----

Total Examinations 3,175

(ii) PARASITOLOGY DIVISION

TOTAL TESTS PERFORMED IN 1954

Blood

Total examined	..	..	..	..	..	..	..	10,147
Malarial parasites	..	..	..	..	..	..	..	2,463
Trypanosomes	..	..	..	..	..	..	..	9
Microfilariae	..	..	..	..	..	..	..	2

Urine

Total examined	..	..	..	..	..	..	..	6,515
<i>Schistosoma haematobium</i> ova		..	..	..	..	..	..	430
<i>Trichomonas vaginalis</i>	..	..	..	..	..	..	..	35

Faeces

Total examined	..	..	..	..	..	..	..	5,656
<i>S. mansoni</i> ova	..	..	..	..	..	..	..	4
Hookworm ova	..	..	..	..	..	..	..	489
<i>Ascaris</i> ova	..	..	..	..	..	..	..	1,462
<i>Taenia</i> ova	..	..	..	..	..	..	..	29
<i>Trichuris trichiura</i> ova	..	..	..	..	..	..	..	31
<i>Entamoeba histolytica</i>	..	..	..	..	..	..	..	83
<i>Strongyloides</i> larvae	..	..	..	..	..	..	..	204

Total Examinations 22,318

(iii) CAUSES OF DEATH IN 437 POST MORTEM EXAMINATIONS

Newborn	24
Diseases of the cardiovascular system	44
<i>Diseases of the Respiratory system</i>	
Pneumonia (including bronchopneumonia)	28
Tuberculosis	22
Carcinoma of lung	1
Whooping cough	1
Total	52
<i>Diseases of the central nervous system</i>	
Meningitis (pneumococcus 7, unclassified 3, staphylococcus 2, one each by meningococcus, tubercle bacillus, H. influenzae and salmonella)	16
Cerebral malaria	3
Encephalitis	9
Rabies	3
Trypanosomiasis	2
Total	33
<i>Diseases of the Genito-urinary system</i>	
Nephritis (all types)	6
Phelonephritis	6
Carcinoma of ovary	2
Carcinoma of kidney	1
Carcinoma of prostate	1
Total	16
<i>Diseases of the Liver</i>	
Cirrhosis	4
Carcinoma of liver	2
Hepatitis	11
Total	17

Diseases of the Gastro-intestinal tract

Gastroenteritis	8
Carcinoma	2
Perforation	6
Obstruction	8
Appendicitis	2

Total 26

Infectious and parasitic diseases

Anthrax	1
Amoebiasis	4
Diphtheria	1
Lymphogranuloma inguinale	1
Pyæmia and septicaemia	17
Tetanus	2
Typhoid	13

Total 39

Miscellaneous Diseases

Malnutrition	16
Sickle-cell disease	13
Complications of child birth	5
<i>Reticuloses</i>	7
Others	10
Unclassified	13

Total 64

Unnatural causes 122

Total Post mortem examinations analysed .. 437

SUMMARY OF EXAMINATIONS DONE AT MEDICAL RESEARCH INSTITUTE IN 1954

Haematology	6,718
Pathology	724
Post-mortems	467
Biochemistry	3,175
Bacteriology	14,475
Yellow fever vaccinations	527
Parasitology	22,318
Total	48,404

APPENDIX "G"

(to Chapter IX—*Schistosomiasis*)

SECTION (1)

THE IDENTIFICATION OF THE SNAIL VECTORS OF HUMAN SCHISTOSOME PARASITES
IN THE GOLD COAST

The discrimination of the snail vectors of schistosome parasites from harmless fresh-water species of molluscs is no more difficult than distinguishing culicine from anopheline mosquitoes.

In general, there are in the Gold Coast ten distinct types of fresh-water snails which are commonly recorded. Only three of these ten types have been proved to be capable of transmitting schistosomiasis. The common fresh-water snails including the potential vectors are briefly described below in order to facilitate the proper identification of the snail-hosts.

(1) *Physa* sp. (Non-vector).

Shell sinistral (i.e., when the shell is held with the apex uppermost and with the aperture facing the examiner, it will be seen that the aperture is to the left—*cp.*, dextral). Shell is smooth, thin and transparent with sharply pointed spire. No operculum (i.e. a cap which fits into the aperture and protects the soft tissues of the snail when its body is retracted within the shell) present. Prefers standing water; wide distribution but less common than *Physopsis* sp. Size of adult specimens seldom exceeds 12 mm. in length. Does not transmit human schistosomes.

(2) *Lanistes* sp.—(Non-vector).

Shell sinistral; operculum present. Can grow to large size; often broader than long. Fully grown specimens may measure 50 mm. Young specimens can be distinguished from the snail-hosts of *Schistosoma haematobium* by noting the presence of the operculum. Found in both still and flowing water. Edible and does not transmit schistosomiasis.

(3) *Bulinus* sp.—(Vector of *S. haematobium*).

Shell sinistral; without operculum. Very similar in shape to *Physopsis* sp. but smaller in size. Largest specimens recorded locally are 6.0 mm. long by 4.5 mm. broad. The snails are restricted in distribution occurring only in the Northern Territories and in the Accra plains. Can readily transmit urinary schistosomiasis.

(4) *Physopsis* sp.—(Principal vector of *S. haematobium*).

Shell sinistral; without operculum. Seldom exceeds 15 mm. long by 10 mm. broad. Prefers standing or slow-flowing water and cannot survive satisfactorily in large rivers. Widely distributed in the Colony and Northern Territories. Can readily transmit urinary schistosomiasis.

(5) *Bulinus* (*Pyrgophysa*) sp.—(Potential vector of *S. haematobium*).

Shell sinistral; without operculum. Shell much longer than broad with three or more distinct whorls. Usually found in small ponds; widely distributed. Maximum size equals 14 mm. long and 5 mm. broad. Snails similar to this species have been shown to transmit *S. haematobium* in Mauritius and in the Gambia. They are suspected, but not yet proved, to be capable of transmitting the infection in the Gold Coast.

(6) *Pila* sp.—(Non-vector).

Shell dextral; operculum present. Otherwise very similar to *Lanistes* sp. both in size and shape. Edible.

(7) *Limnaea* sp.—(Non-vector).

Shell dextral; without operculum. Body whorl large, spical whorls small, giving shell a sharply pointed spire. Seldom exceeds in size 17 mm. long by 10 mm. broad. Prefers clean and still water in large ponds, dams, etc. This snail is the vector of *Fasciola gigantica*, the liver fluke parasite of cattle, sheep and goats. Widespread distribution in the Gold Coast. Often spelt *Lymnaea*.

(8) *Melanoides* sp.—(Non-vector).

Shell dextral; operculum present. Shell much longer than broad with five or more distinct whorls. Prefers running water and only accidentally found in standing water. Common throughout the Gold Coast. May grow to a size of 45 mm. long by 15 mm. broad. Edible.

(9) *Biomphalaria* sp.—(Vector of *S. mansoni*).

Shell discoidal (flat and spiral). Maximum size equals 15 mm. by 3 mm. Not very common in the Gold Coast but is recorded at Bogoso, Tarkwa, Owabi, Wa, Bawku, etc).

(10) *Cyraululus* sp.—(Non-vector)

Shell discoidal but much smaller in size than *Biomphalaria* sp. Adult specimens seldom exceed 3 mm. in diameter by 1 mm. in depth. Common throughout the Gold Coast.

Thus to distinguish the harmless non-vector snails from those that transmit schistosomiasis the following criteria may be noted:—

- (1) Any snail that lives on land or in salt water is NOT a vector of schistosomiasis.
- (2) Any snail that is larger than the thumb-nail of a man is NOT a vector.
- (3) Any snail that possesses an operculum is NOT a vector.
- (4) Any snail with a dextral shell (that is the aperture or opening of the shell is to the right when it is held with the apex uppermost and with the aperture facing the person who is holding the shell) is NOT a vector.

- (5) The above items differentiate all non-vector species, except *Physa*, from the species which transmit schistosomiasis. *Physa* sp. can be readily distinguished from *Bulinus* and *Physopsis* by its sharp pointed spire and its very thin and transparent shell.
- (6) Any snail with a discoidal shell larger than 4 mm. in diameter is likely to be *Biomphalaria*, vector of *S. mansoni* in the Gold Coast.

REFERENCES

- ALVES, W. and CLARKE, V DE V (1953). A key to the families of some African gastropods. *J. Trop. Med. Hyg.*, 56, 84.
- MOZLEY, A. The snail hosts of Bilharzia in Africa. H. K. Lewis & Co., Ltd., London, Pp. VIII 76 Demy. 8vo.
- SECTION (2)
- Publications and Reports relating to Schistosomiasis in the Gold Coast*
- BERNER, L. (1951).—Entomological reports on development of the River Volta basin. London: Wightman Mountain.
- BERRY, E. G.—Intermediate hosts of bilharziasis in West Africa; their distribution and methods of control (Unpublished Report).
- BLAIR, D. M. (1952).—Bilharziasis survey of British Africa. (October, 1950–February, 1951). World Health Organisation Report. WHO/Bilharz./2 11th March, 1952.
- EDWARDS, E. E., and McCULLOUGH, F. S. (1954).—Studies on the Life-Cycles of *Schistosoma haematobium* and *S. mansoni* in the Gold Coast. *Ann. Trop. Med. Parasit.*, 48, 164.
- GAMBLE, M. E. (1954).—Vesical carcinoma associated with widespread schistosomiasis. *W. Afr. Med. J.* (New Series), III, 48.
- HARRIS, F. C. (1952).—A field trial of Miracil D. for the mass treatment of Bilharzia in the Gold Coast. *W. Afr. Med. J.* (New Series), I 79.
- HUGHES, M. H. (1949).—A case of Bilharzia of the appendix, with strangulation of the ileum. *Brit. J. Surg.* 36, 428.
- INGRAM, A. (1924).—Note on a possible intermediate host of *Schistosoma haematobium* in the Gold Coast. *Ann. Trop. Med. Parasit.*, 18, 265.
- MACFIE, J. W. S. (1920).—The occurrence of the lateral-spined Bilharzia eggs (*Schistosoma mansoni*) in urine. *J. Trop. Med. Hyg.*, 23, 45.
- MACDONALD, G. (1955).—Medical implications of the Volta River Project. *Trans. R. Soc. Trop. Med. Hyg.* 49, 13.
- McCULLOUGH, F. S. (1955b).—Some aspects of the investigation on schistosomiasis and its snail hosts in the Gold Coast. Report of the Proceedings of a Conference of Health Inspectors and Health Superintendents, held at Accra, Gold Coast. Government Printer, Accra.
- McCULLOUGH, F. S. (1955b).—Observations on *Schistosoma haematobium* infection and on the vector snails at Tema in the Gold Coast. *W. Afr. Med. J.* (New Series), IV, 18.
- McCULLOUGH, F. S. (1955c).—On a focus of *Schistosoma haematobium* infection transmitted by *Bulinus truncatus* in the Gold Coast. (In press).
- McCULLOUGH, F. S. (1955d).—Apparent resistance of *Bulinus* (*Pyrgophysa*) *forshalii* to *Schistosoma haematobium* infection in the Gold Coast. (In Press).
- McCULLOUGH, F. S.—Schistosomiasis investigation in the Gold Coast. (Unpublished reports, Ministry of Health, Accra, Gold Coast).
- MESSENT, J. J. (1951).—Treatment of urinary schistosomiasis with Nilodin. *Trans. R. Soc. Trop. Med. Hyg.*, 45, 127.
- MESSENT, J. J. (1954).—Triostam in schistosomiasis. *Ibid.*, 48, 351.
- OWEN, G. A. (1950).—The incidence of urinary Bilharzia in school children in villages of southern Togoland. Annual Medical and Health Report for the year 1950. Government Printing Department, Accra, Gold Coast.
- BILHARZIA—how bilharzia goes from one person to another (An illustrated booklet for educational use). Information Services Department of the Gold Coast Government, Accra, Gold Coast.

SECTION (3)

Data on the distribution of the snail vectors of S. haematobium and S. mansoni in the Gold Coast and in British Mandated Togoland. The occurrence of some other species of fresh-water snails is also shown.

- Part (a) Distribution of the snails in Gold Coast Colony, Eastern Province.
- Part (b) Distribution of the snails in Gold Coast Colony, Western Province.
- Part (c) Distribution of the snails in Ashanti.
- Part (d) Distribution of the snails in the Northern Territories.

PART (A)

GOLD COAST COLONY—EASTERN PROVINCE

Date	Locality	Snails Found	Remarks
Jan., 1954	Accra	<i>Physopsis</i> sp.	Vectors found in pond at west side of Alajo village on the Nsawam Road. Pond used for fishing and washing.
Jan., 1954	Mile 15, Accra-Nsawam Road.	<i>Physopsis</i> sp. <i>Pila</i> sp.	Swampy ponds on both sides of the pond. Vectors were common among aquatic vegetation in the habitat on the north side of the road.
At frequent intervals during 1952, 1953 and 1954.	Pokoasi and Maieyera	<i>Physopsis</i> sp. <i>Pyrgophysa</i> sp. <i>Lanistes</i> sp. <i>Physa</i> sp. <i>Melanoides</i> sp. <i>Pila</i> sp. <i>Limnaea</i> sp.	In the River Nsaki and its associated ponds, channels, etc., the snail-hosts are common. <i>S. haematobium</i> is hyperendemic. <i>Limnaea</i> sp. is mostly confined to the dam belonging to the Pig Farm.
As above	Papao, Abbogba, Ashongman and Ablayee and Haatso.	<i>Physopsis</i> sp. <i>Pyrgophysa</i> sp. <i>Limnaea</i> sp.	Near each of the villages are ponds which are used for drinking, washing, etc., in which the vectors are abundant. <i>S. haematobium</i> is endemic in the area.
Feb., 1952	Ajenkotoku	<i>Physopsis</i> sp.	Snails found in habitat near railway line.
Feb., 1952	Medea	<i>Physopsis</i> sp.	Snails found in large, extensive ditch bordering the road from Medea to the railway station at Ajenkotoku. Water used for swimming, washing and fishing.
Feb., 1952 and at subsequent visits.	Nsawam and Akwamu-mangro Village (two miles from Nsawam).	<i>Physopsis</i> sp.	Snails occur in ponds bordering the River Densu. Hyperendemic area.
Feb., 1952	Doboro	<i>Physopsis</i> sp.	
April, 1952	Mangoasi	<i>Physopsis</i> sp. <i>Melanoides</i> sp.	A few snails found in River Densu.
	Asuboi	<i>Physopsis</i> sp.	Vector Snails common in the small stream beside the town. <i>S. Haematobium</i> endemic.
	Kpakpasu Village ...	<i>Physopsis</i> sp.	Vectors found in Avato Stream. Stream dries up but water remains in a few ponds.
	Suhum	<i>Physopsis</i> sp.	Snails occur in the stream flowing through the town. 100 per cent of the school children infected with <i>S. haematobium</i> .
	New Tafo	<i>Physopsis</i> sp. <i>Pyrgophysa</i> sp. <i>Lanistes</i> sp. <i>Melanoides</i> sp.	Vector Snails common in the Beyera Stream. <i>S. haematobium</i> endemic.
June to September, 1952	Nungua, Tema, Kpone, Prampram, Dodowa districts.	<i>Physopsis</i> sp. <i>Pyrgophysa</i> sp. <i>Melanoides</i> sp. <i>Pila</i> sp. <i>Lanistes</i> sp.	For a description of the habitat and distribution of the snails in this area (see McCullough, 1952).
12-4-54	Doyum	<i>Physopsis</i> sp.	A few snails were found in a small pond beside the stream about 2 miles from Doyum to Larteh Junction.
At frequent intervals between June, 1952 and June, 1953.	Dawa, mile 42, from Accra to Ada.	<i>Physopsis</i> sp. <i>Physopsis</i> sp. (albino type) <i>Bulinus</i> sp. <i>Lanistes</i> sp.	During the dry season the snail-hosts are common in the extensive T-shaped drainage ditch bordering the main road and about $\frac{1}{2}$ mile to the West of Dawa village. Water used for swimming and washing. Local children infected with <i>S. haematobium</i> . During the wet season the vectors were difficult to find. A typical and ideal habitat.
5-9-52	Sege (old town) ...	<i>Physopsis</i> sp.	Snails occur in river Mi which lies to the West of the village. <i>Physopsis</i> sp. common on dead leaves in the bed of the stream. Eggs and juvenile snails noted. Stream bed is sandy parts.
2-9-52	Mile 48, from Accra to Ada.	<i>Physopsis</i> sp. <i>Pila</i> sp.	A few snails were found in a large pond bordering the main road.
2-9-52	Koloidaw	<i>Physopsis</i> sp. <i>Bulinus</i> sp.	A few snails occur in the large pond at the South border of the village. Water used for drinking.
2-9-52	Tamatuku	<i>Pyrgophysa</i> sp.	A small number of snails were found in a pond (40 yds. x 30 yds.). Water used for washing. Little aquatic vegetation.
2-9-54	Kaja	<i>Pyrgophysa</i> sp.	Snails were collected in several small ponds in the district.
2-9-52	Amlakpo, Bedeku, Kuyeyina, Kpotame, Dogobom, Vume and Tefe.	<i>Pyrgophysa</i> sp. <i>Pila</i> sp.	In the neighbourhood of these villages and bordering the road-side from Ada to Tefe there are numerous ponds, ditches and swamps in many of which small numbers of snails were found. Towards Ada the water is blackish and does not contain fresh-water snails.

PART (A)—contd.

GOLD COAST COLONY—EASTERN PROVINCE—contd

Date	Locality	Snails Found	Remarks
20-9-54	Mile 91.9 on Anyirawasi-Ho road.	<i>Physopsis</i> sp. ... <i>Pila</i> sp.	The snails were found in a small pond in the bed of a stream which crosses the road at mile 91.9. The pond is visited by nearby villagers. Cercariae emerging from some of the vector snails.
20-9-54	River Alabo at Togoland-Colony boundary sign board.	<i>Physopsis</i> sp. ... <i>Pila</i> sp. <i>Melanoides</i> sp. <i>Pyrgophysa</i> sp.	The vectors were recorded in a small ox-bow pond leading into the river. Water very muddy; vegetated with rotting leaves; shaded. The vectors were not found in the river itself, the rate of flow being too fast. Water apparently not visited.
20-9-54	Ho	<i>Physopsis</i> sp. ... <i>Pila</i> sp.	The vectors were numerous in the Gadakyi (?) stream beside Ho Leper Settlement. The stream, where it crosses the road, is clogged with vegetation. It is not known whether the stream is much used by the local populace.
20-9-54	Kpetoe	<i>Physopsis</i> sp. ...	A few snails were collected in the Porepore stream which was almost dry except under the road bridge where the vectors were found. Transmission is believed to be incurred in this stream and not in the Todzie river.
20-9-54	Vumenu village ...	<i>Physopsis</i> sp. ...	A few snails were found in small ponds in the bed of the Vumenu stream. Transmission probable.
20-9-54	Wayanu village ...	<i>Physopsis</i> sp. ... <i>Pila</i> sp.	The snail-hosts occurred in ponds in the bed of the Waya stream which had ceased flowing.
21-9-54	Takla village	<i>Physopsis</i> sp. ... <i>Pila</i> sp.	The vectors were common in one very small pond (1 yd. in diameter x 2 ft. deep) in the dry bed of the Waya stream. The muddy water is used by the villagers for drinking.
24-9-54	Kpetsu village ...	<i>Physopsis</i> sp. ... <i>Pila</i> sp.	A few vector snails were found in shallow water (Avato stream) under road bridge north of the village. Except for a few isolated ponds the stream was dry.
3-9-52	Ke Lagoon	<i>Bulinus</i> sp. ... <i>Pyrgophysa</i> sp. <i>Bila</i> sp. <i>Gyraulus</i> sp.	The vectors were found adhering to <i>Ceratophyllum</i> sp. The extensive Lagoon is much used for fishing and "blood in the urine" was reported to be very common. It is probable that the Lagoon is the most important focus of schistosomiasis in the whole of the region. Guinea worm is very common.
3-9-54	Dabala and district ...	<i>Pyrgophysa</i> sp. <i>Pila</i> sp. <i>Gyraulus</i> sp.	The district abounds in swamps containing fresh-water. Although schistosomiasis is common among the local school children (M.O. Keta), I was unable to find the natural vectors, i.e. <i>Physopsis</i> and <i>Bulinus</i> .
3rd, 4th and 5th Sept., 1952.	Between mile 83 and 84, Tefe to Keta Road	<i>Pyrgophysa</i> sp.	A few snails found in the large swamp that lies on both sides of the road.
As above	Between mile 84 and 85	<i>Melanoides</i> sp. <i>Pila</i> sp.	No snail-hosts were found in the river Todzie (?). The rate of flow of the river was fast. Little aquatic vegetation. Women carrying water from river.
As above	Afife mile 99	<i>Pyrgophysa</i> sp.	A few snails were found in the swamp. <i>Pista</i> abundant. Water used for washing and drinking.
As above	Keta, Denu, Dzodze, Ehi, Weta, etc. Districts.	<i>Pyrgophysa</i> sp.	In these districts a search was made for snails but few habitats were seen bordering the roads.
Feb., 1952 and 18th Sept., 1953.	Mile 53 from Accra to Akuse.	<i>Physopsis</i> sp. ...	Snails found in a small stream or ditch which intersects the main road.
As above	Area round Akuse ...	<i>Physopsis</i> sp. ... <i>Pyrgophysa</i> sp. <i>Pila</i> sp. <i>Lanistes</i> sp.	<i>Physopsis</i> africana was found in only one large ditch about $\frac{1}{2}$ mile to the South of Akuse. Between Kpong and Akuse and South of Osudoku there occur many ponds and swamps bordering the Volta in which <i>Pyrgophysa</i> was not uncommon. Schistosomiasis is known to be endemic in the area and is believed to be specially common in the Osudoku area.
22nd Sept., 1954 ...	Kpedze (Awlime) ...	<i>Physopsis</i> sp. ... <i>Pila</i> sp. <i>Melanoides</i> sp.	The vectors were found in a very small ditch or stream in the Zongo part of the town to the North of the Kpedze-Kpadafe road. The water is used by the Zongo people. The habitat was clogged with emergent vegetation and the snails were numerous. The vectors were not found in the main stream of the town although it is considered that this is the main sources of transmission.
23rd Sept., 1954 ...	Akrofu villages ...	<i>Physopsis</i> sp. ... <i>Pila</i> sp.	The vectors were abundant in swampy habitats bordering the road at both Big Akrofu and Small Akrofu villages. A few were collected in the Alabo river. Transmission occurs.
18th Sept., 1954 ...	Tosaing village near Anum.	<i>Pyrgophysa</i> ... <i>forshali</i>	This species was collected in large numbers in ponds near the village.
30-8-54	Akwatia town and C.A.S.T. Diamond Mines.	<i>Physopsis</i> sp. ... <i>Limnaea</i> sp.	Snails common in streams and borrow-pits in the area. Infection endemic.

PART (A)—contd.

GOLD COAST COLONY—EASTERN PROVINCE—contd.

Date	Locality	Snails Found	Remarks
	River Tiankama at Kototintin.	<i>Physopsis</i> sp. ... <i>Physa</i> sp.	Snails very common where stream crosses Akwatia-Oda Road. Water from stream used for drinking, washing, bathing, etc. Infection endemic.
31-8-54	Akim-Oda town ... (Apetesu stream Awumfena Stream Bangora Stream and Nyankumasi Stream)	<i>Physopsis</i> sp. ... <i>Physa</i> sp. <i>Limnaea</i> sp. <i>Lanistes</i> sp. <i>Melanoides</i> sp.	<i>R. Apetesu</i> : Vectors found in deep pond beside stream at Junior Government Quarters. None found where stream crosses the main road near hospital. <i>R. Awumfena</i> : Vectors numerous at upstream side of bridge near the hospital. This is an important transmission site. Snails infected. <i>R. Bangora</i> : Snails found at the road bridge and also where the same stream crosses the Akim-Swedru-Oda Road. Important source of transmission. <i>R. Nyankumasi</i> : A few snails were collected from this slow-flowing stream which borders Oda.
	Nkawkaw	<i>Physopsis</i> sp. ...	
	Moraso	<i>Physopsis</i> sp. ...	
Feb., 1952 and at subsequent intervals.	Adaiso	<i>Physopsis</i> sp. ... <i>Pyrgophysa</i> sp. <i>Melanoides</i> sp. <i>Pila</i> sp.	Snails are abundant in swampy habitat connected with river which flows beside the west border of the town. Hyperendemic focus of <i>S. haematobium</i> .
17-2-52	Mepom or Sunkrong ...	<i>Physopsis</i> sp. ...	Snails found in small water-logged depression in farm clearing (on L.H.S. of road facing Adaiso). Snails were abundant including many juveniles.
17-2-52	Asoukaw	<i>Physopsis</i> sp. ...	Snails abundant in deep pond beside road culvert. Typical habitat. Water used for washing and swimming.
21-2-52	Achiasi	<i>Physopsis</i> sp. ...	Snails found in typical habitat near village.
30-8-54	Okorasi village (near Adaiso).	<i>Physopsis</i> sp. ...	Snails occur in slow-flowing stream beside the village. <i>S. haematobium</i> endemic.
22-2-52	Akroso Village ...	<i>Physopsis</i> sp. ...	Snails common in suitable habitat near village.
31-8-54	Akim-Swedru and Ewusa	<i>Physopsis</i> sp. ... <i>Physa</i> sp.	<i>R. Kyirhyirepu</i> : Vectors common in this very dirty stream into which the street drains flow.
		<i>Physopsis</i> sp. ... <i>Pyrgophysa</i> sp. <i>Lanistes</i> sp.	<i>R. Kweteng</i> : Vectors at road bridge. Snails infected.
		<i>Melanoides</i> sp. <i>Lanistes</i> sp.	<i>R. Kosiko</i> : Vectors not found although the river may favour their survival in certain places.
31-8-54	Aduasa Village near Akim-Swedru.	<i>Physopsis</i> sp. ... <i>Lanistes</i> sp. <i>Melanoides</i> sp.	A few vector snails were found in the Akontain Stream which is the water supply of the villagers. Infection, if it occurs, is likely to be only moderate.

PART (B)

GOLD COAST COLONY—WESTERN PROVINCE

Date	Locality	Snails Found	Remarks
13-2-52	Kwami Quaye village near Obrachere Road No. 225.	<i>Physopsis</i> sp. ...	Snails found in a shallow, shaded stream which crosses the road.
13-2-52	Jahazi village Road No. 208.	<i>Physopsis</i> sp. <i>Limnaea</i> sp.	Snails found in large swamp used for fishing, washing and drinking. It is probable that the swamp forms part of the river Ayensu which provides habitats for the snail-hosts at many points throughout its course in the Agona State and elsewhere.
25-2-52	Abodom Road No. 200	<i>Physopsis</i> sp.	Near each of these towns there are suitable habitats in which the vector snails readily survive.
25-2-52	Ochiso Road No. 200	<i>Physopsis</i> sp.	
26-2-52	Asebu Road No. 203	<i>Physopsis</i> sp.	
26-2-52	Akong Road No. 200	<i>Physopsis</i> sp.	

PART (B)—contd.

GOLD COAST COLONY—WESTERN PROVINCE—contd.

Date	Locality	Snails Found	Remarks
5-3-52	About 2 miles west of Beposo.	<i>Physopsis</i> sp. ... <i>Pyrgophysa</i> sp.	Snails found in deep swamps on both sides of the road. Probably the swamps are connected to the river Nhwin, tributary of the Pra. Vectors numerous.
	Asikuma	<i>Physopsis</i> sp.	
	Brisu village near Odoben.	<i>Physopsis</i> sp.	
	Odoben and Kuntanasi	<i>Physopsis</i> sp. ...	At each of these towns and villages the snail vectors were found in slow-flowing streams and ponds where transmission of <i>S. haematobium</i> is incurred.
22-2-52	Nyakrom	<i>Physopsis</i> sp.	
22-2-52	Nsaba	<i>Physopsis</i> sp.	
22-2-52	Akroso village ...	<i>Physopsis</i> sp.	The vector snails were recorded in ponds and slow-flowing streams near each of these towns. <i>S. haematobium</i> endemic.
22-2-52	Swedru	<i>Physopsis</i> sp.	
22-2-52	Mankrong	<i>Physopsis</i> sp.	
12-1-55	Daboasi Junction, Sekondi-Cape Coast road.	<i>Physopsis</i> sp. ... <i>Physa</i> sp.	Snails fairly common in densely vegetated swamps on either side of road to Daboasi. <i>S. haematobium</i> endemic.
	Jamra	<i>Physopsis</i> sp. ...	
	Asin-Nyankumasi ...	<i>Physopsis</i> sp. ...	
6-1-55	Mile 22.9 Agona Axim road; River Awurow.	<i>Physopsis</i> sp. ... <i>Limnaea</i> sp. <i>Lanistes</i> sp.	Snails fairly common (also egg masses) among water-lilies and other emergent vegetation at the road bridge. Ideal habitat, slow-flowing, used for fishing washing, etc., by nearby villagers.
6-1-55	Banso village, River Sewuni.	<i>Physopsis</i> sp. ... <i>Lanistes</i> sp.	Snails found in small residual (side) ponds but not in stream itself. Water used for washing and fishing, etc.
6-1-55	Between mile 28 and 29, Agona-Axim road.	<i>Physopsis</i> sp. ... <i>Lanistes</i> sp.	A few snails found in a pond bordering South side of road near Ajumako village. The pond is part of a swampy stream.
11-1-55	Half mile from Impohaw.	<i>Physopsis</i> sp. ... <i>Limnaea</i> sp.	Snails few in small stream beside road.
11-1-55	Apowa-Impohaw road; River Aboabo, three miles from Apowa at Pekia village.	<i>Physopsis</i> sp. ... <i>Lanistes</i> sp.	Snails common among water-lily leaves and debris. Ideal habitat, shaded. <i>S. haematobium</i> endemic.
10-1-55	Agona-Apowa road ...	<i>Pyrgophysa</i> sp. <i>Lanistes</i> sp.	Snails common in recently made pond at road side.
4-3-52	Simpa Road No. 314	<i>Physopsis</i> sp. ...	Snails found in typical habitat near town and beside road.
4-3-52	Nsuaem Road No. 320	<i>Physopsis</i> sp. ...	Vectors occur in habitat bordering the main road.
3-3-52	Tarkwa	<i>Physopsis</i> sp. ... <i>Biomphalaria</i> sp. <i>Pyrgophysa</i> sp.	The vectors were numerous in a small stream situated near the hospital and towards the Eastern side of the town. This locality is probably the most important focus of <i>S. mansoni</i> in the Gold Coast.
-52	Bogoso and Kofigyan Krom.	<i>Biomphalaria</i> sp. <i>Pyrgophysa</i> sp.	Snails common in stream which is probably a tributary of the Mansi. It seems possible that local transmission of <i>S. mansoni</i> may occur in this locality.
2-3-52	Akropong Road No. 304.	<i>Physopsis</i> sp. ...	Vectors very numerous in stream (Ahiri river) and in small pond beside the stream. Water used by the villagers and infection (<i>S. haematobium</i>) is reported to be common.
23-2-54	River Dieso at Dieso, near Maudaso.	<i>Physopsis</i> sp. ... <i>Pyrgophysa</i> sp.	A few snails were found in the temporarily impounded stream (bridge being built).
1-3-52	Maudaso village, Road No. 303.	<i>Physopsis</i> sp. ...	Vectors found in large stream near railway crossing. Water fairly fast flowing and used by the villagers. Local transmission occurs. The stream is a tributary of the Ankobra river.
23-2-54	Road 303 Stream at mile 30.4 (Between Dieso and Ayenfuri).	<i>Physopsis</i> sp. ...	A few snails were found. Stream used for fishing. No village close to habitat.
21-2-54	River Ankobra at Asanwinso road junction to Wiawso.	<i>Physopsis</i> sp. ...	Snails were numerous in a pond bordering the river and in borrow-pits further away (about 200 yards) from the river. Control: By molluscicides and filling in borrow-pits. This is yet another example of the "borrow-pit" menace.
29-2-52	Bibiani Road No. A9 (Mile 52.3).	<i>Physopsis</i> sp. ...	Snails found in concealed swampy ditch on R.H.S. of road from Kumasi to Bibiani at mile 52.3. Habitat not close to any village and seldom used. In the dam at Bibiani only <i>Limnaea</i> sp. were found.

PART (C)
ASHANTI

Date	Locality	Snails Found	Remarks
27-2-52	Akrokeri	<i>Physopsis</i> sp. ...	A few vectors were found in the stream that flows through the town.
28-2-54	Awabi reservoir at Akropong, near Kumasi.	<i>Physopsis</i> sp. ... <i>Biomphalaria</i> sp. <i>Pyrgophya</i> s.p. <i>Limnaea</i> s.p.	The vectors were abundant in the reservoir which provides ideal conditions for their survival. <i>Biomphalaria</i> sp. especially common.
26-2-52	Obuasi	<i>Physopsis</i> sp. ...	The vectors were found in a stream (tributary of the Jimi) which crosses the road to Obuasi. No villages could be seen in the locality.
20-2-54	River Ofin at Adiembra mile 31.9 Road A.9	<i>Physopsis</i> sp. ...	Snails found in deep borrow-pits on west side of bridge. Probably introduced from river. Transmission may occur but water rarely used.
10-2-54	River Fia Road A4 9 miles to Nkoranza.	<i>Biomphalaria</i> sp. ...	Snails fairly common and egg masses found. Water used occasionally for washing, etc., but no villages are near the habitat. Transmission uncertain.
12-2-54	River Mampa Road A26 10 miles from Sampa-Wenchi road.	<i>Physopsis</i> sp. ...	Snails fairly common in long, deep pond on North side of road culvert. Transmission uncertain as no villages are close to habitat. Control by drainage, weed clearing and molluscicides.
12-2-54	Small swampy stream at Sampa 1/4-1 mile on road A26 to Bere-kum.	<i>Physopsis</i> sp. ...	Snails fairly common in small ponds at road culvert. Water used by Sampa inhabitants for washing and drinking. Transmission likely to occur. Control as above.
13-2-54	River Mampa 7 miles from Nsawkaw to Sekwa.	<i>Physopsis</i> sp. ...	Snails very few in isolated pond in stream bed. Although habitat is not close to any village, the water was used for washing. Control: Molluscicides.
Dec. 1954	River Kumkum at Asamang.	<i>Physopsis</i> sp. ... <i>Pyrgophya</i> sp. <i>Physa</i> sp.	Snails found among emergent vegetation where the populace wash and swim. The incidence of <i>S. haematobium</i> is high among the school children at the village.
15-2-54 16-2-54	At Bere-kum reservoir	<i>Pyrgophya</i> sp.	Snails very common in small outlet pools below the dam. Breeding. The same species was also found at mile 102 (Road A.7) where the stream from the reservoir crosses the road. Transmission possible but unlikely.
15-2-54	At Dormaa-Ahenkro, River Pamu.	<i>Physopsis</i> sp. ...	Snails quite common in ideal habitat at road culvert near Customs barrier. Transmission certain and seasonal. Water used for all purposes.
16-2-54	River Tano at Tanaso	<i>Physopsis</i> sp. ...	Snails very common in numerous borrow-pits beside river at road bridge. Transmission probably seasonal. Fish in river are sacred, therefore, molluscicides could only be used with discretion.
16-2-54	River Abu near Nsuta mile 43. Road A.7.	<i>Physopsis</i> sp. ...	Snails common among debris in stream at South side of road culvert. Water used by inhabitants of Nsuta. Transmission is probably seasonal.
16-2-54	River Bua Mile 52 Road A.27.	<i>Physopsis</i> sp. ...	Snails quite common in sluggish rocky stream. Transmission uncertain and if it occurs is seasonal (dry season).
17-2-54	River Kwasi mile 63 on Bechem-Gwaso Road A.6.	<i>Biomphalaria</i> sp. <i>Physopsis</i> sp.	Snails found in small pool in stream bed. Transmission seasonal but uncertain.
17-2-54	River Cherebua Mile 66.9 road A.6.	<i>Biomphalaria</i> sp.	Snails very common among vegetation. Transmission possible but uncertain. Control: Weed clearing and molluscicides. The same species was also found in a swampy pond at roadside at mile 67.6.
17-2-54	River Subri mile 69.3 road A.6.	<i>Physopsis</i> sp. ...	Snails common in shallow stream. Transmission possible but uncertain, no villages near habitat. Control: as above.
17-2-54	River Subin mile 75 road A.6.	<i>Physopsis</i> sp. ...	Snails fairly common among dead leaves in stream-bed. Small village near habitat. Transmission likely and seasonal. Control: Education and molluscicides.
7-2-54	Mile 85.6 road A.6 at entrance to Gawso.	<i>Physopsis</i> sp. ...	A few snails found in very deep pond beside river Gaw. Transmission occurs in river Gaw and is likely to be seasonal (dry season). Control: Education, better water supply; molluscicides would be expensive and only temporarily effective.
18-2-54	River Fete at Mim ...	<i>Physopsis</i> sp. ...	Snails numerous. Transmission likely to occur mostly in the dry season. Control: Education, and all means to reduce the snail population i.e. better drainage molluscicides, better water supply for town.
Nov. 1951	Weila	<i>Physopsis</i> sp. ... <i>Pyrgophya</i> sp.	Snails found in an extensive swamp. (Recorded by Dr. Berry).

PART (D)
NORTHERN TERRITORIES

Time of Survey	Region and Native State	Locality	Snails Found	Remarks
22-11-53	Northern Territories (West) Gonja State.	Between Jentilpe and Grupe, Road No. N.T. 25.	<i>Physopsis</i> sp. ...	Vectors found in the Sankadelima tributary of the Mole river where it intersects the road at approximately 3 miles to the West of Grupe village.
22-11-53	Gonja State ...	Tuna Road No. N.T. 23.	<i>Biomphalaria</i> sp. ... <i>Limnaea</i> sp. ...	The snails occur in the dam and its outlet stream which is a tributary of the Bananyini and Gbalon rivers.
22-11-53	do.	Gndabo village Road No. N.T. 23.	<i>Physopsis</i> sp. ... <i>Pyrgophysa</i> sp. ... <i>Pila</i> sp. ... <i>Lanistes</i> sp. ...	The snails were abundant in the small dam, beside the village, which is used as a water supply.
22-11-53	Wala State ...	Ga Road No. N.T. 23	<i>Segmentina</i> sp. ... <i>Lanistes</i> sp. ...	The vectors were not found in the dam which looks ideal for their survival.
22-11-53	Wala State ...	Kangolo village Road No. N.T. 23.	<i>Physopsis</i> sp. ... <i>Pyrgophysa</i> sp. ... <i>Lanistes</i> sp. ...	The snails occur in the stream which intersects the road approximately 1½ miles North of the village.
22-11-53	Wala State ...	Kunfabela village Road No. N.T. 23.	<i>Physopsis</i> sp. ...	The vectors occur in the Kunfabela stream which intersects the road at mile 6½ from Wa.
7-11-53	do.	Wa	<i>Biomphalaria</i> sp. ...	Vectors were numerous in the "sacred crocodile" pond situated ½ mile West of Wa on the R.H.S. of the road to Dorimon. Women carrying water from the pond. Dense aquatic vegetation, mainly <i>Pistis</i> sp.
9-11-53	do.	Wa	<i>Biomphalaria</i> sp. ... <i>Bulinus</i> sp. ... <i>Pyrgophysa</i> sp. ...	The vectors were found in a pond and large dam situated about ½ mile from Wa on the R.H.S. of the road to Lawra. Seems an ideal habitat for the snails. Water used for domestic purposes and for fishing and swimming. It is believed that the vectors may have only recently been introduced to the habitat and the locality may become an important focus of both <i>S. mansoni</i> and <i>S. haematobium</i> in later years.
7-11-53	do.	Dorimon	<i>Physopsis</i> sp. ... <i>Pyrgophysa</i> sp. ... <i>Biomphalaria</i> sp. ...	The vectors were numerous in a stream (tributary of the Dagere?) between Boro and Dorimon. Three out of 30 boys attending Dorimon school complained of haematuria. No vectors were found in Dorimon dam. Little aquatic vegetation. <i>Biomphalaria</i> found in outlet stream.
7-11-53	Wala State ...	Dorimon	<i>Pyrgophysa</i> sp. ... <i>Limnaea</i> sp. ... <i>Biomphalaria</i> sp. ...	A few snails were found in the stream flowing from Dorimon dam.
7-11-53	do.	Between Dobo and Wenchia.	—	In several habitats between these two localities no snail-hosts were found. In Wenchia dam <i>Pyrgophysa</i> sp. were noted. This habitat seems suitable for the known vectors of schistosomiasis which may later be introduced.
21-11-53	do.	Near Wa, Road No. N.T. 23.	<i>Physopsis</i> sp. ...	Only a single specimen was collected in the large swamp that intersects the road approximately 1 mile from Wa.
21-11-53	do.	Gworiri Road No. N.T. 23.	<i>Physopsis</i> sp. ... <i>Limnaea</i> sp. ... <i>Lanistes</i> sp. ...	A few snails were found in the Velere stream which intersects the road.
10-11-53	do.	Issa	<i>Biomphalaria</i> sp. ... <i>Limnaea</i> sp. ...	Vectors were collected in the stream (name?) at mile 13 from Fian. The same species were again found in a stream at mile 14.
18-11-53	Lawra Division ...	Zambor Road No. N.T. 23.	<i>Physopsis</i> sp. ...	The vectors were found in shallow cattle-watering ponds near road on the R.H.S. at mile three from Lawra.
18-11-53	do.	Donweni Road No. N.T. 23.	<i>Physopsis</i> sp. ...	Snails found in impounded stream about half mile to the south of the town. Water used for drinking, no swimming allowed. Little aquatic vegetation. Snails (egg masses and juveniles) abundant.

PART (D)—contd.
NORTHERN TERRITORIES—contd.

Time of Survey	Region and Native State	Locality	Snails Found	Remarks
19-11-53	Lawra Division—contd.	Tori	<i>Biomphalaria sp.</i> ... <i>Limnaea sp.</i>	Snails found in impounded stream 2½ miles from Lawra, road to Jirapa.
19-11-53	do.	Kalsara	<i>Physopsis sp.</i> ...	Snails occur in impounded stream 3½ miles from Lawra.
19-11-53	do.	Mile 6½ from Lawra to Jirapa.	<i>Physopsis sp.</i> ...	Snails occur in stream which intersects the road at approximately 6½ miles from Lawra to Jirapa.
19-11-53	do.	Duri, 8½ miles from Lawra.	<i>Physopsis sp.</i> ... <i>Lanistes sp.</i>	A few snails were noted in the large dam. Ideal habitat. Seventeen of 56 local school children complained of haematuria. The same species of snails were also found in a stream that crosses the road at 9·3 miles from Lawra.
17-11-53	do.	Hamale, Road No. N.T. 21.	<i>Physopsis sp.</i> ...	The vector species occur in a large pond on the R.H.S. of the road and about 3 miles from Hamale.
17-11-53	Tumu Division ...	Wido Village ...	<i>Physopsis sp.</i> ... <i>Lanistes sp.</i> ... <i>Pyrgophysa sp.</i>	A few snails were found in a large pond at mile 42 on the R.H.S. of road from Tumu. Ideal habitat.
11-11-53	do.	Jefisi Road No. N.T.13.	<i>Physopsis sp.</i> ... <i>Limnaea sp.</i>	The snails were found in a swamp near (east of) the village on the R.H.S. of the road to Tumu. Water used for washing.
16-11-53	do.	Tumu	<i>Biomphalaria sp.</i> ... <i>Pyrgophysa sp.</i> ... <i>Limnaea sp.</i> ... <i>Lanistes sp.</i>	The snails were common below the spill-way of the dam at Tumu. The water is used for washing and fishing. May become a focus of <i>S. mansoni</i> .
15-11-53	Tumu Division ...	Frontier Post Road No. N.T.19.	<i>Physopsis sp.</i> ... <i>Lanistes sp.</i>	Only a single specimen of <i>Physopsis</i> was found in a fast-flowing stream at the frontier.
12-11-53	Tumu Division ...	Tumu, Road No. N.T.13.	<i>Physopsis sp.</i> ...	A few snails were found in a fast-flowing stream intersecting the road at mile 3 from Tumu.
16-11-53	Tumu Division ...	Sakulo	<i>Physopsis sp.</i> ... <i>Biomphalaria sp.</i> ... <i>Limnaea sp.</i> ... <i>Pyrgophysa sp.</i> ... <i>Lanistes sp.</i>	The snails were found in a stream intersecting the road near but south of Sakulo. Typical stream-habitat. Water used for fishing, etc. It is probable that the vectors also occur at Sentia.
16-11-53	Tumu Division ...	Between Sakulo and Sekai.	<i>Physopsis sp.</i> ... <i>Pyrgophysa sp.</i>	Several swamps and ponds occur in this area and in two such habitats the vectors were found. No snail-hosts were seen in the dam between Tumu and Nakpabia.
12-11-53	Tumu Division ...	Pina, Road No. N.T. 13.	<i>Physopsis sp.</i> ...	A few vectors were found in the stream between mile 89 and 90 and crossing the road to the east of Pina Village.
12-11-53	Kassena Nankani ...	Nakong Road No. N.T.13.	<i>Physopsis sp.</i> ...	The snails were noted in the stream and dam near the village.
12-11-53	Kassena Nankani ...	Katiu Road No. N.T.13.	<i>Physopsis sp.</i> ...	A few snails were found in dam—an ideal habitat for the snails. No swimming allowed.
12-11-53	Kassena Nankani ...	Chana Road [No. N.T.13.	<i>Pyrgophysa sp.</i> ... <i>Physopsis sp.</i>	Snails found in dam.
13-11-53	Builsa	Chuchiliga Road No. N.T.13.	<i>Physopsis sp.</i> ...	Vectors found in a stream that crosses the road about two miles south-west of Chuchiliga. The same species was also found in another stream two and a half miles from Chuchiliga. The streams were beginning to dry up.
13-11-53	Builsa	Bilinsa village, Road No. N.T.13.	<i>Physopsis sp.</i> ...	Snails found in a stream which crosses the road at mile 7 from Chuchiliga. At mile 5 there is a large swamp on the R.H.S. of the road probably connected to the Pisinsim river in which <i>Pyrgophysa sp.</i> was found in small numbers.
13-11-53	Builsa	Sandema	<i>Bulinus sp.</i> ... <i>Lanistes sp.</i>	The snails occur in the dam. Only marginal vegetation.

PART (D)—*cont'd.*NORTHERN TERRITORIES—*cont'd.*

Time of Survey	Region and Native State	Locality	Snails found	Remarks
13-11-53	Builsa	Sandema and District	<i>Physopsis sp.</i> ...	The vectors occur in cattle ponds near roadside about 2½ miles from Sandema to Doninga. No vectors were found in three streams at miles 5, 7 and 9 crossing road to Doninga.
13-11-53	Builsa	Doninga	<i>Physopsis sp.</i> <i>Pyrgophysa sp.</i> ...	A few snails occur in the stream that flows beside the village. The water is used for all purposes.
13-11-53	Builsa	Kanjaga	<i>Lanistes sp.</i> ...	No vectors were found in the Kanjaga dam (swamp). The conditions seem favourable for the snails if they are later introduced.
13-11-53	Builsa	Bidema	<i>Bulinus sp.</i> <i>Biomphalaria sp.</i> <i>Pyrgophysa sp.</i> <i>Lanistes sp.</i> ...	The dam seems an ideal habitat for the snails which occur quite commonly among the rich growth of aquatic plants.
14-11-53	Builsa	Fumbisi	<i>Physopsis sp.</i> ...	The vectors were found in a slow-flowing stream near (and to the East of) Fumbisi.
14-11-53	Builsa	Wiaga	<i>Biomphalaria sp.</i> ...	The vectors were found in a stream (the Valabeli?) intersecting the road to the South of Wiaga.
14-11-53	Builsa	Between Wiaga and Sandema.	<i>Physopsis sp.</i> ...	The streams occur and in middle stream (two culverts close together) the snail-hosts were found.
Time of Survey	Locality	Snails found	Remarks	
12-11-53	Bwania village ...	<i>Physopsis sp.</i> ... <i>Lanistes sp.</i> ...	The vectors occur in a small swamp situated about 50 yards on the Chuchiliga side of the Tano river.	
Nov., 1951	Navrongo	<i>Physopsis sp.</i> ...		
Nov., 1951	Sambrungo Road No. N.T. 13.	<i>Bulinus sp.</i> ...		
Nov., 1951	Zaurungu	<i>Physopsis sp.</i> ...	The vectors occur in a pond near the school that is used by the children for swimming.	
Nov., 1951	Nangodi Road No. N.T. 13.	<i>Physopsis sp.</i> ... <i>Biomphalaria sp.</i> ...		
Nov., 1951	Tili village Road No. N.T. 13.	<i>Physopsis sp.</i> ...		
Nov., 1951	Zebila Road No. N.T. 13.	<i>Physopsis sp.</i> ... <i>Biomphalaria sp.</i> ...		
Nov., 1951	Bawku	<i>Physopsis sp.</i> ...		
Nov., 1951	Binduri near Bawku	<i>Biomphalaria sp.</i> ...		
Nov., 1951	Pusiga	<i>Physopsis sp.</i> ... <i>Biomphalaria sp.</i> ...		
Nov., 1951	Tamale	<i>Physopsis sp.</i> ...	The vectors occur in the reservoir supplying water to Tamale. No swimming allowed. Also large crocodiles.	

"APPENDIX H"

(To Chapter X—The Mental Health Service)

TABLE LXXIX

ADMISSIONS, DISCHARGES, DEATHS AND ESCAPES OF PATIENTS AT THE ACCRA MENTAL HOSPITAL

Year	End of period year	Admissions (New and re-admissions)	Discharges	Deaths	Escapes	Resident Criminals
1952	692	354	126	168	20	111
1953	736	486	196	128	33	122
1954	869	585	208	139	54	134 males 11 females

TABLE LXXX

ORIGIN OF PATIENTS ADMITTED TO ACCRA MENTAL HOSPITAL

Year	East, West and Trans- Volta/ Togoland Regions	Ashanti	North- ern Terri- tories	Nigeria	Liberia	British Togoland	Euro- peans	Asiatics
1952 ..	100	118	132	4	—	—	—	—
1953 ..	175	82	151	30	5	33	1	—
1954 ..	221	75	191	23	3	29	1	2

TABLE LXXXI

ELEVEN IMPORTANT CAUSES OF MORTALITY AT THE ACCRA MENTAL HOSPITAL 1954

Serial No.	Intermediate List Number	Condition	Number of cases	Number of deaths
1	A.137 (c)	All other ill-defined causes of morbidity	388	56
2	A.1	Tuberculosis of the Respiratory System	24	13
3	A.37	Malaria (all types)	190	8
4	A.65 (c)	Other specified and unspecified anaemias	33	8
5	A.126	All other diseases of the skin	63	8
6	A.73	Epilepsy	15	6
7	A.90	Broncho-pneumonia	15	5
8	A.42 (d)	Other diseases due to Helminths	16	3
9	A.83	Other diseases of the Heart	5	3
10	A.91	Primary, atypical, other and unspecified pneumonia ..	20	3
11	A.109	Chronic, other and unspecified nephritis	6	3

APPENDIX I

(To Chapter XII, Maternity and Child Welfare Services)

TABLE LXXXII

MATERNITY: SOME CONDITIONS ARISING FROM THE PREGNANT STATE TREATED IN HOSPITAL: 1954

Region	ANTENATAL CONDITIONS										INTRAPARTUM				POST-PARTUM		
	ABORTION										Placenta Praevia	Eclampsia	Retained Placenta	Post- partum Haemorrhage	Puerperal Pyrexia		
	Threa- tened	Incom- plete	Complete	Septic	Ectopic Preg- nancy	Pre- Eclam- ptic Toxaemia	Hyper- emesis Gravida- rum	Mastitis	Concealed accidental Haem- orrhage	Hydram- nios							
Accra ...	72	283	173	36	79	83	16	17	5	5	23	13	63	89	11		
Eastern ...	115	73	100	21	26	27	17	13	2	3	15	27	77	36	42		
Western ...	74	90	135	27	27	27	17	19	—	2	21	13	149	26	100		
Trans-Volta/Togoland ...	28	42	49	5	9	11	1	—	1	2	9	4	43	6	49		
Ashanti ...	156	526	146	73	45	59	20	66	4	—	46	32	157	31	74		
Northern Territories ...	94	43	68	2	3	8	1	11	—	3	7	2	19	4	27		
Total ...	539	1,057	671	164	189	215	72	126	12	15	121	91	508	192	303		

TABLE LXXXIII

MATERNAL DEATHS IN HOSPITALS ATTRIBUTABLE TO CERTAIN CONDITIONS OF THE PREGNANT STATE: 1954

Region	ANTENATAL					INTRA-PARTUM				POST-PARTUM			
	All Abortion	Ectopic Pregnancy	Pre-eclamptic Toxaemia	Concealed Accidental Haemorrhage	Other antnatal conditions	Placenta Praevia	Eclampsia	Retained placenta	Post partum haemorrhage	Puerperal fever	Total		
Accra ...	1	6	—	1	4	2	—	1	1	—	16		
Eastern ...	—	2	3	—	1	—	—	—	—	—	8		
Western ...	—	5	1	—	1	2	5	—	4	2	42		
Trans-Volta/Togoland ...	—	—	—	—	5	2	3	5	2	4	16		
Ashanti ...	1	5	—	—	2	2	—	—	—	1	14		
Northern Territories ...	2	—	—	—	—	2	2	—	1	1	8		
Total ...	4	18	4	1	13	8	12	28	8	8	104		

TABLE LXXXIV

MATERNITY: HOSPITAL DELIVERIES BY REGIONS, 1954

Region	Normal	Forceps	Breech	Classical Caesarean Section	Lower Segment Caesarean Section	Destruction	Others	Total
Accra	1,776	110	120	12	319	41	59	2,437
Eastern	879	50	43	19	40	48	34	1,113
Western	1,236	129	41	81	31	13	105	1,636
Trans-Volta/Togoland	360	19	15	77	28	7	66	572
Ashanti	1,103	254	18	19	165	60	117	1,736
Northern Territories	1,152	44	56	31	11	24	15	1,333
Total	6506	606	293	239	594	193	396	8,827

TABLE LXXXV

MATERNITY: MATERNAL DEATHS DURING HOSPITAL DELIVERY BY REGIONS, 1954

Region	Normal	Forceps	Breech	Classical Caesarean Section	Lower Segment Caesarean Section	Destruction	Others	Total
Accra	1	2	0	0	0	0	2	5
Eastern	9	2	0	2	0	0	0	13
Western	4	18	2	24	3	3	9	63
Trans-Volta/Togoland	1	1	0	5	2	2	2	13
Ashanti	6	12	0	13	1	0	0	32
Northern Territories	3	4	1	9	0	2	1	20
Total	24	39	3	53	6	7	14	146

TABLE LXXXVI

MATERNITY: INFANT DEATHS DURING HOSPITAL DELIVERY BY REGIONS: 1954

Region	Normal	Forceps	Breech	Classical Caesarean	L. Seg- ment Caesarean	Destruc- tion	Others	Total
Accra	144	See "Others"	21	See "Others"	See "Others"	41	133	339
Eastern	93	19	20	2	3	48	2	187
Western	118	33	15	29	6	13	39	253
Trans-Volta/Togoland	35	10	8	15	13	7	2	90
Ashanti	166	141	—	41	1	60	0	409
Northern Territories	38	15	3	10	0	24	22	112
Total	594	218	67	97	23	193	198	1,390

TABLE LXXXVII

MATERNITY: INFANTS BORN IN HOSPITALS BY REGIONS: 1954

Region	LIVE BIRTHS		STILL BIRTHS		TOTAL BIRTHS		Grand Totals of Births
	Male	Female	Male	Female	Live	Still	
Accra	1,049	1,065	180	159	2,114	339	2,453
Eastern	458	466	92	68	924	160	1,084
Western	671	641	142	111	1,312	253	1,565
Trans-Volta/Togoland	289	191	52	38	480	90	570
Ashanti	711	536	217	132	1,247	349	1,606
Northern Territories	625	551	57	55	1,176	112	1,288
Total	3,803	3,450	740	573	7,253	1,303	8,556

TABLE LXXXVIII
DISTRICT MATERNITY WORK, 1954

Region	ANTENATALS		DELIVERIES		Live Babies born	Still Births	Abortions	Maternal Deaths
	New	Total	Normal	Abnormal				
Accra			Statistics not available for 1954					
Eastern	623	2,061	280	4	405	10	2	1
Western*	10,005	35,848	4,277	129	4,411	103	45	2
Trans-Volta/Togoland ...	—	—	—	—	—	—	—	—
Ashanti	26,531	89,128	7,287	419	7,875	225	188	17
Northern Territories ...	185	976	29	—	30	—	1	—

*Figures from Sekondi not available for 1954.

TABLE LXXXIX
RED CROSS CLINICS, EASTERN AND WESTERN REGIONS—1954

Region				Centre	Total Antenatal Attendance	Remarks
Eastern Region				Koforidua	9,200	
				Huhunya	200	
				Otrokp.	160	
Western Region				Fanti Nyankumasi	434	(Mobile Clinics visits).
				Jukwa	108	do.
				Komenda	152	do.
				Abakrampa	58	do.
				Anomabu	48	do.
				Moree	56	
				Mankessim	32	
				Anto-Esuekyir	11	
Total					10,459	

Total Eastern Region 9,560

Total Western Region 899

TABLE XC
WESTERN REGION RED CROSS CLINIC ANTENATAL ATTENDANCES
1952-1954

District Centre				1952	1953	1954
Fanti Nyankumasi				461	685	434
Jukwa				181	167	108
Komenda				242	244	152
Abakrampa				172	97	58
Anomabu				52	59	48
Moree*				—	—	56
Mankessim*				—	—	32
Anto-Esuekyir*				—	—	11
Total				1,108	1,252	899

*Opened during 1954.

TABLE XCI
CHILD WELFARE SERVICES

Region	Total Attendances at Clinics	Total number of home visits
Accra	74,843	27,179
Eastern	12,176	4,630
Western	4,357	Nil
Trans-Volta/Togoland	5,310	Nil
Ashanti	49,787	11,029
Northern Territories	7,040	Nil
Total	153,513	42,838

APPENDIX "J"

(To Chapter xiii Training of Medical Auxiliaries)

TABLE XCII
STATISTICS OF TRAINED NURSES, 1954

Establishment	1,127
Number on strength at beginning of year	813
Number who qualified S.R.N. or Q.R.N. during year	107
Number who left the service during the year	71
Total number at 31st December, 1954	849

TABLE XCIII
CAUSES OF TRAINED NURSES LEAVING THE SERVICE, 1954

	1953	1954
Died	2	1
Invalided	9	8
Retired	7	5
Dismissed	18	18
Resigned	40	39
Total	76	71

TABLE XCIV
ANALYSIS OF TRAINED NURSES AND MIDWIVES, 1954

Establishment	1,197
Number on the strength	898
Number of Mental Nurses	147
Number of Health Visitors	9
Number of Midwives	70
Number who are not general nurses	226
Total number of general nurses at 31st December	672

TABLE XCV
MATERNITY LEAVE NURSES AND MIDWIVES, 1954

Number of trained female staff	420
Number of applications made during year	73
Number on leave during year	98

TABLE XCVI
STATISTICS OF NURSES IN TRAINING, 1954

Number in training at 1st January	277
Number who commenced hospital training	105
Number who ceased training	40
Number in training at 31st December	342

TABLE XCVII
CAUSES OF NURSES IN TRAINING CEASING TRAINING DURING 1954

	Males	Females	Total
Died	—	—	Nil
Invalided	—	1	1
Dismissed	6	5	11
Resigned	1	27	28
Total number of ceased training	7	33	40

APPENDIX "K"

SCIENTIFIC PUBLICATIONS DURING 1954 BY STAFF OF THE MINISTRY OF HEALTH

- ASHWORTH F. and EDINGTON G. M. *W. Afr. Med. J.* 3 (n.s.) 150—"Mycosis fungoides in a Gold Coast African".
- COLBOURNE M. J. and EDINGTON G. M. *J. Trop. Med. Hyg.* 57 203—"The Mortality from malaria in Accra".
- COLBOURNE M. J. and EDINGTON G. M. *Proc. internal Blood Transfusion Congress. Paris*—"Sickling and malaria in the Gold Coast".
- EDINGTON G. M. *Brit. Med. J.* 1 871—"Sickle cell trait and sickle cell anaemia".
- EDINGTON G. M. "Malnutrition in African mothers, infants and young children". London. H.M.S.O. 1954 p. 115—"Haemosiderosis in the Gold Coast African".
- EDINGTON G. M. *W. Afr. Med. J.* 3 n.s. 66—"Haemosiderosis and anaemia in the Gold Coast African".
- EDINGTON G. M. *Trans R. Soc. Trop. Med. Hyg.* 48 419—"Cardiovascular disease as a cause of death in the Gold Coast African".
- EDINGTON G. M. *Proc. internal Blood Transfusion Congress. Paris*—"The pathology of sickle-cell disease in West Africa".
- EDINGTON G. M. and LEHMANN H. *Trans R. Soc. Trop. Med. Hyg.* 48 332—"A case of sickle-cell haemoglobin C. disease and a survey of haemoglobin C. incidence in West Africa".
- EDINGTON G. M. and LEHMANN H. *J. Clin. Path.* 7 171—"Haemoglobin S and haemoglobin C".
- EDINGTON G. M. and LEHMANN H. *Lancet* 2 173—"Haemoglobin G. A new haemoglobin found in a West African".
- HARRIS F. C. and LOMAX C. D. *W. Afr. Med. J.* 3 n.s. 53—"Thalassaemia minor in an African in the Gold Coast".
- HAWES A. J. and HUGHES, M. H. *Brit. Med. J.* 1 968—"Bacterial endocarditis due to *Chronic bacterium prodigiosum*".
- HUGHES M. H. *W. Afr. Med. J.* 3 n.s. 29—"Salmonella dublin infections in the Gold Coast".
- HUGHES M. H. *W. Afr. Med. J.* 3 n.s. 157—"Some observations on the pathology of Onchocerciasis".
- SCOTT D. *Trans R. Soc. trop. Med. Hyg.* 47 405—"Sleeping Sickness Control in North-West Ashanti".
- WADDY B. B. and GREENE J. D. *Trans. R. Soc. trop. Med. Hyg.* 48 64—"A cycle of Cerebro-spinal meningitis in the Gold Coast".
- WADDY B. B. *W. Afr. Med. J.* 2 n.s. 71—"The spread of Cerebro-spinal meningitis across Africa".
- WADDY B. B. "Cerebro-spinal meningitis in the Gold Coast 1900-1950". (awarded the Langley Memorial Prize).
- NUGENT D. A. W., SCOTT D. and WADDY B. B. "The effect on incidence of Guinea worm infection of water plant treatment with D.D.T.". (accepted for publication).

APPENDIX "L"

SPECIAL CONTRIBUTORS TO THE ANNUAL REPORT, 1954

Name	Qualification	Rank	Reference
Dr. A. J. Hawes, O.B.E.	M.D., F.R.C.P., D.T.M. & H. ..	Physician Specialist	Chapter IV (i).
Mr. C. Bowesman ..	B.A., M.D., B.Ch., B.A.O., D.T.M. & H., F.R.C.S.(Ed).	Surgical Specialist	Chapter IV (iii).
Mr. S. W. Cooper ..	F.R.C.S.(Ed), D.T.M., D.T.H.	Surgical Specialist	Chapter IV (ii).
Dr. A. B. Brereton ..	M.B., B.Ch., D.M.R. & E. ..	Specialist Radiologist	Chapter IV (viii).
Dr. A. McKelvie ..	M.B., Ch.B., D.T.M. & H. ..	Specialist Leprologist	Chapter XI.
Dr. E. B. Forster ..	M.A., M.D., D.P.H.	Specialist Psychiatrist	Chapter X.
Dr. B. B. Waddy ..	B.M., B.Ch., D.P.H.	Specialist Epidemiologist	Chapter VI.
Dr. H. P. Graham ..	M.B., B.S., D.A.	Specialist Anaesthetist	Chapter IV (vii).
Dr. J. R. G. Spicer ..	M.B., B.S., D.T.M. & H., D.O.M.S.	Specialist Ophthalmologist ..	Chapter IV (iv).
Dr. J. B. Baird ..	M.B., Ch.B., F.R.C.S., D.L.O.	Ear, Nose, and Throat Specialist.	Chapter IV (vi).
Dr. J. G. Cameron ..	M.B., Ch.D., M.R.C.O.O. ..	Specialist Gynaecologist and Obstetrician.	Chapter XII.
Dr. M. H. Hughes ..	M.A., D.M., B.Ch. Dip. Bact., D.T.M. & H.	Specialist Pathologist	Chapter VII (i).
Dr. G. M. Edington ..	M.D., Ch.B., Dip. Clin. Path., D.T.M. & H.	Specialist Pathologist	Chapter VII (i).
Dr. C. B. Huppenbauer	M.D. (Tubingen)	Ophthalmologist	Chapter IV (v).
Dr. M. J. Colbourne ..	M.D., Ch.D., D.P.H., D.T.M. & H.	Officer in Charge Malaria Investigation.	Chapter VIII.
F. S. McCullough, Esq.	M.Sc.	Medical Biologist	Chapter IX.
L. F. U. Wix, Esq. ..	B.Sc., A.R.I.C.	Government Chemist	Chapter VII (ii).
Miss M. E. Gregory ..	S.R.N., S.C.M., H.V.(Cert.) ..	Senior Superintendent of Health Visitors.	Chapter XII (ii).
Miss A. M. Trembath	B.A.S.S.(Cert.), I.A.(Cert.) ..	Chief Hospital Welfare Officer	Chapter IV (x).

RETURN "A"

HOSPITALS

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND DISEASES (OUT-PATIENTS)
FOR THE YEAR 1954

Inter- mediate List Number	Diseases	IN-PATIENTS						OUT-PATIENTS		
		Remaining in hospital on 31st Dec., 1953	Yearly Total				Total cases treated	Remaining in hospital on 31st Dec., 1954	Males	Females
			Admissions		Deaths					
			Males	Females	Males	Females				
A. 1	T.B. of respiratory system ...	136	763	314	126	39	1,213	315	1,595	831
A. 2	T.B. of meninges and central nervous system ...	1	22	14	5	5	37	1	38	15
A. 3	T.B. of intestines peritoneum and mesenteric glands ...	5	46	33	15	7	84	1	35	21
A. 4	T.B. of bones and joints ...	20	67	30	—	—	117	33	141	82
A. 5	T.B. all other forms ...	6	89	55	11	5	150	8	633	337
A. 6	Congenital Syphilis ...	—	22	19	—	1	41	1	69	45
A. 7	Early Syphilis ...	—	22	11	—	—	33	1	93	23
A. 8	Tabes dorsalis ...	—	3	1	—	—	4	—	—	—
A. 9	General paralysis of insane ...	—	9	—	1	—	9	—	3	—
A.10	All other Syphilis ...	6	69	29	2	—	104	1	771	582
A.11	Gonococcal infections ...	15	460	264	8	4	739	14	5,872	1,998
A.12	Typhoid fever ...	15	299	187	24	8	501	20	59	29
A.13	Paratyphoid fever and other salmonella infections ...	2	85	51	4	4	138	4	9	3
A.14	Cholera ...	—	—	—	—	—	—	—	—	—
A.15	Brucellosis (undulant fever) ...	—	3	—	—	—	3	1	—	—
A.16 (a)	Bacillary dysentery ...	21	497	280	43	38	798	19	575	452
(b)	Amoebiasis ...	15	292	207	8	9	514	7	488	321
(c)	Other unspecified forms of dysentery ...	10	301	258	12	17	569	9	2,191	1,791
A.17	Scarlet fever ...	—	41	13	—	—	54	1	138	90
A.18	Streptococcal sore throat ...	1	100	70	—	1	171	1	192	132
A.19	Erysipelas ...	1	6	7	—	—	14	—	12	4
A.20	Septicaemia and pyaemia ...	—	51	32	13	8	103	1	5	2
A.21	Diphtheria ...	—	5	5	1	1	10	—	11	12
A.22	Whooping Cough ...	3	42	44	3	3	89	1	889	742
A.23	Meningococcal infections ...	7	109	69	34	21	185	20	53	20
A.24	Plague ...	—	—	—	—	—	—	—	—	—
A.25	Leprosy ...	3	22	3	3	—	28	4	1,114	978
A.26	Tetanus ...	8	247	126	78	43	381	8	102	71
A.27	Anthrax ...	1	10	4	1	—	15	—	2	3
A.28	Acute poliomyelitis ...	—	24	2	2	—	26	1	13	6
A.29	Acute infectious encephalitis ...	—	8	6	1	1	14	—	—	2
A.30	Late effect of acute poliomye- litis and acute infectious encephalitis ...	2	9	4	—	—	15	1	34	16
A.31	Smallpox ...	—	15	1	—	—	16	—	18	1
A.32	Measles ...	4	170	134	8	6	308	3	1,256	923
A.33	Yellow Fever ...	—	—	1	—	1	1	—	—	—
A.34	Infectious hepatitis ...	12	214	124	20	6	350	2	212	106
A.35	Rabies ...	—	10	3	8	3	13	—	4	—
A.36 (a)	Louse-borne epidemic typhus ...	—	—	—	—	—	—	—	—	—
(b)	Flea-borne endemic typhus (murine) ...	—	—	1	—	—	1	—	—	—
(c)	Tick-borne epidemic typhus ...	—	—	—	—	—	—	—	—	—
(d)	Mite-borne typhus ...	—	—	—	—	—	—	—	—	—
(e)	Other and unspecified typhus ...	1	1	—	—	—	2	—	—	—
A.37 (a)	Vivax malaria (benign tertian) ...	4	354	201	12	14	559	10	1,560	986
(b)	Malariae malaria (quartan) ...	—	332	98	2	—	430	1	914	475
(c)	Falciparum malaria (malignant terian) ...	39	1,410	735	38	44	2,184	27	6,700	4,788
(d)	Blackwater fever ...	2	31	14	2	1	47	—	10	—
(e)	Other and unspecified forms of malaria ...	55	2,269	1,460	94	62	3,784	73	25,789	16,849
A.38 (a)	Schistosomiasis vesical (s. haematobium) ...	12	245	112	6	1	369	5	2,086	1,231
(b)	Schistosomiasis intestinal (s. mansoni) ...	—	26	20	—	—	46	2	79	160
(c)	Schistosomiasis pulmonary (s. japonicum) ...	—	—	—	—	—	—	—	—	—
(d)	Other and unspecified Schisto- somiasis ...	—	59	33	—	—	92	—	1,243	470
A.39	Hydatid disease ...	—	—	—	—	—	—	—	—	—
A.40 (a)	Onchocerciasis ...	2	76	10	1	—	88	5	408	218
(b)	Loiasis ...	—	5	1	—	—	6	—	5	1
(c)	Filaria (bancrofti) ...	1	31	10	—	—	42	3	107	71
(d)	Other filariae ...	1	41	9	1	—	51	3	91	29
A.41	Ankylostomiasis ...	19	606	295	6	2	920	18	3,394	2,080
A.42 (a)	Tapeworm (infestation) and other cestode infestations ...	3	193	155	1	—	351	2	382	234
(b)	Ascariasis ...	11	419	312	13	6	742	12	4,554	2,602
(c)	Guinea worm (dracunculosis) ...	3	293	77	—	—	373	9	947	429
(d)	Other diseases due to helminths ...	5	102	73	7	2	180	1	814	631
A.43 (a)	Lymphogranuloma venereum ...	1	41	8	—	—	50	—	145	15
(b)	Granuloma inguinale, venereal ...	1	57	18	—	—	76	—	185	25
(c)	Other and unspecified venereal diseases ...	5	146	47	6	4	198	12	1,066	430
(d)	Food poisoning infection and intoxication ...	1	118	31	6	1	150	2	122	25
(e)	Relapsing Fever ...	—	1	—	—	—	1	—	—	—
(f)	Leptospirosis icterohaemorrha- gica (Weil's disease) ...	—	3	1	—	—	4	—	167	118

RETURN "A"—*contd.*

HOSPITALS

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND DISEASES (OUT-PATIENTS)
FOR THE YEAR 1954

Inter- mediate List Number	Diseases	IN-PATIENTS							OUT-PATIENTS	
		Remaining in hospital on 31st Dec., 1953	Yearly Total				Total cases treated	Remaining in hospital on 31st Dec., 1954	Males	Females
			Admissions		Deaths					
			Males	Females	Males	Females				
(g)	Yaws	8	101	47	—	—	156	3	28,204	19,635
(h)	Chickenpox	2	123	37	—	—	162	1	506	225
(i)	Dengue	—	22	10	—	—	32	—	80	59
(j)	Trachoma	1	17	34	—	—	52	4	204	163
(k)	Sandfly fever	—	—	6	—	—	6	—	10	3
(l)	Leishmaniasis	—	—	—	—	—	—	—	—	—
A.43 (m)	Trypanosomiasis gambiensis ...	13	32	12	11	2	57	11	41	18
	Trypanosomiasis rhodesiensis ...	—	—	—	—	—	—	—	—	—
	Other and unspecified Trypano- somiasis	4	52	18	2	1	74	5	81	52
(n)	Dermatophytosis	3	88	40	—	—	131	—	452	342
(o)	Scabies	6	71	30	—	—	107	4	3,420	2,239
(p)	All other diseases classified as infective and parasitic ...	—	122	53	6	6	175	2	509	293
A.44	Malignant neoplasm of buccal cavity and pharynx	1	8	4	2	1	—	—	12	6
A.45	Malignant neoplasm of oeso- phagus	—	5	—	—	—	13	—	—	—
A.46	Malignant neoplasm of Stomach ...	1	48	20	10	4	69	10	34	29
A.47	Malignant neoplasm of intestines except rectum ...	2	23	6	1	—	31	—	1	—
A.48	Malignant neoplasm of rectum ...	1	90	31	1	1	122	7	70	29
A.49	Malignant neoplasm of larynx ...	—	2	2	—	—	4	—	—	—
A.50	Malignant neoplasm of trachea, and of bronchus and lung not specified as secondary ...	—	21	6	2	1	27	—	6	6
A.51	Malignant neoplasm of breast ...	—	—	31	—	2	31	3	1	15
A.52	Malignant neoplasm of cervix uteri	3	—	254	—	4	257	4	—	252
A.53	Malignant neoplasm of other and unspecified parts of uterus ...	6	—	199	—	18	205	4	—	284
A.54	Malignant neoplasm of prostate ...	4	36	—	3	—	40	2	21	1
A.55	Malignant neoplasm of skin ...	1	123	63	—	1	187	7	138	83
A.56	Malignant neoplasm of bone and connective tissue ...	—	60	21	2	—	81	1	82	46
A.57	Malignant neoplasm of all other and unspecified sites ...	15	104	73	12	6	192	5	84	91
A.58	Leukaemia and aleukaemia ...	—	11	3	6	2	14	—	2	2
A.59	Lymphosarcoma and other neo- plasms of lymphatic and hae- matopoietic system ...	—	18	9	4	3	27	—	10	7
A.60	Benign neoplasms and neoplasms of unspecified nature ...	7	69	113	—	1	189	3	116	108
A.61	Nontoxic goitre	—	11	36	—	—	47	—	24	24
A.62	Thyrototoxicosis with or without goitre	1	4	16	—	—	21	1	—	10
A.63	Diabetes mellitus	9	150	56	5	3	215	21	115	56
A.64 (a)	Beriberi	—	21	8	3	2	29	3	37	19
(b)	Pellagra	—	29	39	—	2	68	4	126	98
(c)	Scurvy	—	5	2	—	—	7	—	152	121
(d)	Other deficiency states ...	13	225	187	5	35	425	20	623	533
A.65(a)	Pernicious and other hyper- chromic anaemias	1	44	32	3	5	77	3	63	47
(b)	Iron deficiency anaemias (hypochromic)	1	101	174	5	20	276	22	219	387
(c)	Other specified and unspecified anaemias	18	266	335	32	27	619	21	1,054	1,099
A.66 (a)	Asthma	6	204	99	7	1	309	2	435	296
A.66 (b)	All other allergic disorders, endocrine, metabolic and blood diseases	10	171	103	12	5	284	9	1,454	512
A.67	Psychoses	—	22	32	2	3	54	1	23	35
A.68	Psychoneuroses and disorders of personality	2	47	30	—	—	79	—	55	35
A.69	Mental deficiency	—	38	12	2	2	50	1	83	43
A.70	Vascular lesions affecting central nervous system	3	58	14	2	2	75	7	664	233
A.71	Nonmeningococcal meningitis ...	1	68	42	23	21	111	4	16	13
A.72	Multiple sclerosis	—	2	—	—	—	2	—	3	—
A.73	Epilepsy,	2	69	44	9	—	115	2	158	75
A.74	Inflammatory diseases of eye ...	2	257	135	1	—	394	5	2,532	2,099
A.75	Cataract	4	49	32	6	—	85	2	221	107
A.76	Glaucoma	—	20	3	—	—	23	—	34	21
A.77 (a)	Otitis externa	1	62	25	—	—	88	2	937	519
(b)	Otitis media and mastoiditis ...	6	180	133	—	—	319	3	1,447	960
(c)	Other inflammatory diseases of the ear	—	74	58	—	—	132	1	2,070	1,164
A.78 (a)	All other diseases and conditions of eye	19	328	251	1	1	598	10	6,641	4,181
(b)	All other diseases of the nervous system and sense organs ...	6	156	88	9	5	250	7	762	437
A.79	Rheumatic fever	—	27	43	—	—	70	—	1,536	830
A.80	Chronic rheumatic heart disease	4	23	29	1	1	56	—	116	94

RETURN "A"—*contd.*

HOSPITALS

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND DISEASES (OUT-PATIENTS)
FOR THE YEAR 1954

Inter- mediate List Number	Diseases	IN-PATIENTS						OUT-PATIENTS		
		Remaining in hospital on 31st Dec., 1953	Yearly Total				Total cases treated	Remaining in hospital on 31st Dec., 1954	Males	Females
			Admissions		Deaths					
			Males	Females	Males	Females				
A.81	Arteriosclerotic and degenerative heart disease ...	4	76	30	24	9	110	4	54	28
A.82	Other diseases of heart ...	20	236	151	49	43	407	19	547	407
A.83	Hypertension with heart disease ...	4	133	66	26	5	203	4	164	105
A.84	Hypertension without mention of heart ...	9	88	41	7	2	138	9	193	101
A.85	Diseases of arteries ...	4	51	6	8	1	61	3	42	19
A.86	Other diseases of circulatory system ...	8	189	67	6	1	264	4	404	202
A.87	Acute upper respiratory infections ...	4	57	73	5	4	134	3	1,993	834
A.88	Influenza ...	2	50	41	—	—	93	3	646	633
A.89	Lobar pneumonia ...	35	566	339	29	27	940	22	404	225
A.90	Broncho-pneumonia ...	21	511	216	90	74	742	26	704	463
A.91	Primary atypical, other and unspecified pneumonia ...	38	713	293	42	28	1,044	25	720	404
A.92	Acute Bronchitis ...	9	377	230	6	3	616	3	3,272	2,449
A.93	Bronchitis, chronic and unqualified ...	17	262	188	3	—	467	6	3,548	2,075
A.94	Hypertrophy of tonsils and adenoids ...	5	157	76	—	—	238	1	325	170
A.95	Empyema and abscess of lung ...	4	49	9	10	3	62	1	38	13
A.96	Pleurisy ...	12	138	84	7	2	234	1	202	89
A.97 (a)	Pneumoconiosis ...	2	83	59	3	2	144	—	107	65
A.97 (b)	All other respiratory diseases ...	5	72	70	—	1	147	1	1,585	981
A.98 (a)	Dental Caries ...	1	113	56	—	—	170	5	2,852	1,814
(b)	All other diseases of teeth and supporting structures ...	3	95	52	2	—	150	2	2,638	1,491
A.99	Ulcer of Stomach ...	3	52	17	3	—	72	3	27	11
A.100	Ulcer of duodenum ...	5	59	12	5	3	76	3	29	7
A.101	Gastritis and duodenitis ...	2	140	63	—	—	205	2	939	547
A.102	Appendicitis ...	9	240	92	10	—	341	8	50	22
A.103	Intestinal obstruction and hernia ...	74	2,196	153	75	15	2,423	73	1,113	274
A.104 (a)	Gastro-enteritis and colitis between 4 weeks and 2 years ...	1	288	201	69	16	490	10	2,971	2,656
(b)	Gastro-enteritis and colitis, ages 2 years and over ...	5	244	210	13	14	459	4	3,464	2,454
(c)	Chronic enteritis and ulcerative colitis ...	1	126	65	4	3	192	2	220	140
A.105	Cirrhosis of liver ...	11	177	63	58	18	251	5	158	67
A.106	Cholelithiasis and cholecystitis ...	2	6	10	1	1	18	—	73	24
A.107	Other diseases of digestive system ...	27	638	418	27	16	1,083	27	11,677	6,633
A.108	Acute nephritis ...	9	104	49	10	7	162	5	181	134
A.109	Chronic, other and unspecified nephritis ...	9	171	111	26	9	291	6	198	113
A.110	Infections of kidney ...	14	75	77	8	2	166	—	291	399
A.111	Calculi of urinary system ...	2	34	15	—	—	51	2	569	2
A.112	Hyperplasia of prostate ...	1	129	—	8	—	130	10	94	—
A.113	Diseases of Breast ...	3	3	176	4	3	182	1	13	353
A.114 (a)	Hydrocele ...	13	285	—	—	—	298	8	547	—
(b)	Disorders of menstruation ...	3	—	427	—	1	430	11	—	3,558
(c)	All other diseases of the genito-urinary system ...	63	927	904	194	13	1,894	79	2,155	2,154
A.115	Sepsis of pregnancy, childbirth and the puerperium ...	11	—	784	—	19	795	3	—	1,869
A.116	Toxaemias of pregnancy and the puerperium ...	21	—	441	—	35	462	3	—	152
A.117	Haemorrhage of pregnancy and childbirth ...	2	—	487	—	25	489	4	—	354
A.118	Abortion without mention of sepsis or toxæmia ...	23	—	2,118	—	7	2,141	15	—	1,113
A.119	Abortion with sepsis ...	4	—	222	—	7	226	2	—	170
A.120(a)	Other complications of pregnancy, childbirth and the puerperium ...	63	—	3,135	—	180	3,198	79	—	6,401
(b)	Delivery without complications ...	54	—	5,210	—	4	5,264	85	—	3,936
A.121	Infections of skin and sub-cutaneous tissue ...	16	765	274	4	2	1,055	52	6,542	3,113
A.122	Arthritis and spondylitis ...	15	313	94	5	1	422	8	1,130	1,711
A.123	Muscular rheumatism and rheumatism, unspecified ...	7	164	127	—	—	298	7	4,578	2,772
A.124	Osteomyelitis and periostitis ...	21	209	109	3	3	339	21	626	286
A.125	Ankylosis and acquired musculo-skeletal deformities ...	—	18	8	—	—	26	1	141	67
A.126(a)	Chronic Ulcer of Skin (including tropical ulcer) ...	96	961	374	3	1	1,431	72	13,720	8,396
A.126(b)	All other diseases of skin ...	36	920	444	13	2	1,400	24	7,603	3,322
(c)	All other diseases of musculo-skeletal system ...	28	464	234	8	4	726	16	3,294	1,186
A.127	Spina bifida and meningocele ...	2	7	3	2	—	12	—	5	11
A.128	Congenital malformations of circulatory system ...	—	17	26	—	—	43	2	33	26

RETURN "A"—*contd.*

HOSPITALS

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND DISEASES (OUT-PATIENTS)
FOR THE YEAR 1954

Inter- mediate List Number	Diseases	IN-PATIENTS							OUT-PATIENTS	
		Remaining in hospital on 31st Dec., 1953	Yearly Total				Total cases treated	Remaining in hospital on 31st Dec., 1954	Males	Female
			Admissions		Deaths					
			Males	Females	Males	Females				
A.129	All other congenital malforma- tions	6	53	53	1	—	112	7	86	70
A.130	Birth injuries	1	8	15	3	4	24	—	12	44
A.131	Postnatal asphyxia and atelec- tasis	—	37	64	15	18	101	—	3	38
A.132(a)	Diarrhoea of newborn (under 4 weeks)	—	48	29	8	4	77	4	325	321
(b)	Ophthalmia neonatorum	—	36	32	2	2	68	—	196	132
(c)	Other infections of newborn	1	80	88	6	5	149	4	278	201
A.133	Haemolytic disease of newborn	—	62	60	—	1	122	8	2	2
A.134	All other defined diseases of early infancy	2	62	62	8	11	126	13	391	429
A.135	Ill-defined diseases peculiar to early infancy, and immaturity unqualified	16	81	79	13	15	176	20	395	269
A.136	Senility without mention of psychosis	2	23	9	3	3	34	1	86	52
A.137(a)	Pyrexia of unknown origin	20	211	123	6	3	354	5	14,607	5,054
(b)	Observation without need for further medical care	12	224	211	6	—	447	7	1,165	919
(c)	All other ill-defined causes of morbidity	85	482	228	59	24	795	48	14,203	11,826
	Total	16,55	30,103	29,656	1,816	1,262	61,414	1,803	237,710	166,029

Inter- mediate List Number	Accidents, Poisonings and Violence (External cause)	IN-PATIENTS							OUT-PATIENTS	
		Remaining in hospital on 31st Dec., 1953	Yearly Total				Total cases treated	Remaining in hospital on 31st Dec., 1954	Males	Females
			Admissions		Deaths					
			Males	Females	Males	Females				
AE.138	Motor vehicle accidents ...	87	2,105	675	105	34	2,867	91	8,216	3,125
AE.139	Other transport accidents ...	68	845	258	26	9	1,171	27	3,290	691
AE.140	Accidental poisoning	3	55	28	8	1	86	8	59	32
AE.141	Accidental falls	25	666	168	16	2	859	38	3,262	807
AE.142	Accidents caused by machinery	18	390	105	14	7	513	9	3,555	368
AE.143	Accidents caused by fire and explosion of combustible material	16	150	89	8	15	255	19	890	229
AE.144	Accidents caused by hot sub- stance, corrosive liquid, steam and radiation ...	15	203	150	3	3	368	19	692	306
AE.145	Accident caused by firearm ...	15	278	46	15	1	339	17	210	32
AE.146	Accidental drowning and sub- mersion	—	16	5	3	1	21	—	98	42
AE.147										
(a)	Foreign body entering eye and adnexa	5	65	20	—	—	90	2	657	404
(b)	Foreign body entering other orifice	1	83	29	1	—	113	2	615	315
(c)	Accidents caused by bites and stings of venomous animals and insects	9	374	192	23	7	575	17	1,602	966
(d)	Other accidents caused by animals	—	71	33	—	—	104	2	413	203
(e)	All other accidental causes ...	37	1,207	304	13	5	1,548	60	15,766	4,776
AE.148	Suicide and self-inflicted injury	3	107	35	15	2	145	—	339	306
AE.149	Homicide and injury purposely inflicted by other persons (not in war)	4	567	255	5	3	826	4	257	1,317
AE.150	Injury resulting from operations of war	—	—	—	—	—	—	—	—	—
	Total	306	7,182	2,392	255	90	9,880	315	39,921	13,920

RETURN "A"—*contd.*

HOSPITALS

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND DISEASES (OUT-PATIENTS)
FOR THE YEAR 1954

Inter- mediate List Number	Accidents, Poisonings and Violence (Nature of injury)	IN-PATIENTS							OUT-PATIENT	
		Remaining in hospital on 31st Dec., 1953	Yearly Total				Total cases treated	Remaining in hospital on 31st Dec., 1954	Males	Females
			Admissions		Deaths					
			Males	Females	Males	Females				
AN.138	Fracture of skull	6	81	32	33	9	119	5	83	32
AN.139	Fracture of spine and trunk ...	9	253	44	23	2	306	37	107	40
AN.140	Fracture of limbs	96	1,352	318	37	13	1,766	64	1,430	627
AN.141	Dislocation without fracture ...	19	243	102	1	1	364	11	985	769
AN.142	Sprains and strains of joints and adjacent muscle	4	282	107	—	1	393	2	2,262	961
AN.143	Head injury (excluding skull fracture)	15	270	135	7	9	420	12	821	349
AN.144	Internal injury of chest, abdo- men, and pelvis	9	196	49	39	16	254	6	257	185
AN.145	Laceration and open wounds ...	59	2,139	574	35	6	2,772	99	20,146	5,166
AN.146	Superficial injury, contusion and crushing with intact skin surface	24	1,268	463	13	1	1,755	20	9,546	2,553
AN.147	Effects of foreign body entering through orifice	7	88	36	1	1	131	2	738	1,641
AN.148	Burns	23	311	196	15	17	530	37	1,043	469
AN.149	Effects of poisons	4	191	96	18	6	291	5	337	143
AN.150	All other and unspecified effects of external causes	31	508	240	33	8	779	15	2,166	985
	Total ...	306	7,182	2,392	255	90	9,880	315	39,921	13,920
	Grand Total ...	1,961	37,285	32,048	2,071	1,352	71,294	2,118	277,631	179,949

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND DISEASES (OUT-PATIENTS)
FOR THE YEAR 1954

Intermediate List Number	Diseases	IN-PATIENTS							OUT-PATIENTS	
		Remaining in hospital on 31st Dec., 1953	Yearly Total				Total cases treated	Remaining in hospital on 31st Dec., 1954	Males	Females
			Admissions		Deaths					
			Males	Females	Males	Females				
A.1	T.B. of respiratory system ...	4	12	7	2	—	23	8	7	4
A.2	T.B. of meninges and central nervous system ...	—	1	3	1	2	4	—	2	1
A.3	T.B. of intestines peritoneum and mesenteric glands ...	—	—	1	—	1	1	—	—	—
A.4	T.B. of bones and joints ...	—	2	—	—	—	2	2	—	—
A.5	T.B. all other forms ...	—	—	—	—	—	—	—	—	—
A.6	Congenital Syphilis ...	—	—	2	—	1	2	—	—	—
A.7	Early Syphilis ...	—	—	—	—	—	—	—	—	—
A.8	Tabes dorsalis ...	—	—	—	—	—	—	—	—	—
A.9	General paralysis of insane ...	—	—	—	—	—	—	—	—	—
A.10	All other Syphilis ...	—	—	—	—	—	—	—	—	—
A.11	Gonococcal infections ...	—	—	—	—	—	—	—	3	10
A.12	Typhoid fever ...	—	1	—	—	—	1	—	1	—
A.13	Paratyphoid fever and other salmonella infections ...	—	3	3	—	—	6	—	3	2
A.14	Cholera ...	—	—	—	—	—	—	—	—	—
A.15	Brucellosis (undulant fever) ...	—	—	—	—	—	—	—	—	—
A.16 (a)	Bacillary dysentery ...	—	—	—	—	—	—	—	157	150
(b)	Amoebiasis ...	—	—	—	—	—	—	—	18	24
(c)	Other unspecified forms of dysentery ...	—	4	1	2	1	5	2	1,769	1,663
A.17	Scarlet fever ...	—	—	—	—	—	—	—	—	—
A.18	Streptococcal sore throat ...	—	—	—	—	—	—	—	23	10
A.19	Erysipelas ...	—	—	—	—	—	—	—	—	—
A.20	Septicaemia and pyaemia ...	—	—	1	—	1	1	—	—	—
A.21	Diphtheria ...	—	—	1	—	—	1	—	—	—
A.22	Whooping Cough ...	—	—	—	—	—	—	—	482	490
A.23	Meningococcal infections ...	—	—	—	—	—	—	—	—	—
A.24	Plague ...	—	—	—	—	—	—	—	—	—
A.25	Leprosy ...	—	—	—	—	—	—	—	—	—
A.26	Tetanus ...	1	4	1	4	1	6	—	—	—
A.27	Anthrax ...	—	—	—	—	—	—	—	—	—
A.28	Acute poliomyelitis ...	—	—	—	—	—	—	—	4	3
A.29	Acute infectious encephalitis ...	—	—	—	—	—	—	—	—	—
A.30	Late effect of acute poliomyelitis and acute infectious encephalitis ...	—	—	—	—	—	—	—	21	15
A.31	Smallpox ...	—	5	4	2	1	9	—	224	264
A.32	Measles ...	—	1	—	—	—	1	—	318	361
A.33	Yellow Fever ...	—	—	—	—	—	—	—	—	—
A.34	Infectious hepatitis ...	—	—	—	—	—	—	—	2	3
A.35	Rabies ...	—	—	—	—	—	—	—	—	—
A.36 (a)	Louse-borne epidemic typhus ...	—	—	—	—	—	—	—	—	—
(b)	Flea-borne endemic typhus (murine) ...	—	—	—	—	—	—	—	—	—
(c)	Tick-borne epidemic typhus ...	—	—	—	—	—	—	—	—	—
(d)	Mite-borne typhus ...	—	—	—	—	—	—	—	—	—
(e)	Other and unspecified typhus ...	—	—	—	—	—	—	—	—	—
A.37 (a)	Vivax malaria (benign tertian) ...	—	—	—	—	—	—	—	—	—
(b)	Malariae malaria (quartan) ...	—	—	—	—	—	—	—	—	—
(c)	Falciparum malaria (malignant tertian) ...	—	2	2	2	2	4	—	96	79
(d)	Blackwater fever ...	—	—	—	—	—	—	—	—	—
(e)	Other and unspecified forms of malaria ...	—	52	42	15	3	94	—	3,358	3,199
A.38 (a)	Schistosomiasis vesical (s. haematobium) ...	—	—	—	—	—	—	—	1	—
(b)	Schistosomiasis intestinal (s. mansoni) ...	—	—	—	—	—	—	—	—	—
(c)	Schistosomiasis pulmonary (s. japonicum) ...	—	—	—	—	—	—	—	—	—
(d)	Other and unspecified Schistosomiasis ...	—	—	—	—	—	—	—	—	—
A.39	Hydatid disease ...	—	—	—	—	—	—	—	—	—
A.40 (a)	Onchocerciasis ...	—	—	—	—	—	—	—	—	—
(b)	Loiasis ...	—	—	—	—	—	—	—	—	—
(c)	Filariasis (bancrofti) ...	—	—	—	—	—	—	—	—	—
(d)	Other filariasis ...	—	—	—	—	—	—	—	—	—
A.41	Ankylostomiasis ...	1	—	—	—	—	1	—	119	98
A.42 (a)	Tapeworm (infestation) and other cestode infestations ...	—	3	—	—	—	3	2	6	8
(b)	Ascariasis ...	—	12	22	—	5	34	—	1,083	1,105
(c)	Guinea worm (dracunculosis) ...	—	—	—	—	—	—	—	8	10
(d)	Other diseases due to helminths ...	—	—	—	—	—	—	—	—	—
A.43 (a)	Lymphogranuloma venereum ...	—	—	—	—	—	—	—	—	—
(b)	Granuloma inguinale, venereal ...	—	—	—	—	—	—	—	—	—
(c)	Other and unspecified venereal diseases ...	—	—	—	—	—	—	—	—	—
(d)	Food poisoning infection and intoxication ...	—	—	—	—	—	—	—	—	—
(e)	Relapsing Fever ...	—	—	—	—	—	—	—	—	—
(f)	Leptospirosis icterohaemorrhagica (Weil's disease) ...	—	—	—	—	—	—	—	—	—

Intermediate List Number	Diseases	IN-PATIENTS							OUT-PATIENTS	
		Remaining in hospital on 31st Dec., 1953	Yearly Total				Total cases treated	Remaining in hospital on 31st Dec., 1954	Males	Females
			Admissions		Deaths					
			Males	Females	Males	Females				
A.43(g)	Yaws	—	—	2	—	—	2	—	1,138	994
(h)	Chickenpox	—	—	—	—	—	—	—	1	—
(i)	Dengue	—	—	—	—	—	—	—	51	68
(j)	Trachoma	—	—	—	—	—	—	—	—	—
(k)	Sandfly fever	—	—	—	—	—	—	—	—	—
(l)	Leishmaniasis	—	—	—	—	—	—	—	—	—
(m)	Trypanosomiasis gambiensis ...	—	—	—	—	—	—	—	—	—
	Trypanosomiasis rhodesiensis ...	—	—	—	—	—	—	—	—	—
	Other and unspecified Trypanosomiasis	—	—	—	—	—	—	—	—	—
(n)	Dermatophytosis	—	—	—	—	—	—	—	—	—
(o)	Scabies	—	—	—	—	—	—	—	706	696
(p)	All other diseases classified as infective and parasitic ...	—	—	—	—	—	—	—	17	18
A.44	Malignant neoplasm of buccal cavity and pharynx	—	—	—	—	—	—	—	—	—
A.45	Malignant neoplasm of oesophagus	—	—	—	—	—	—	—	—	—
A.46	Malignant neoplasm of stomach ...	—	—	—	—	—	—	—	—	—
A.47	Malignant neoplasm of intestines except rectum ...	—	—	—	—	—	—	—	—	—
A.48	Malignant neoplasm of rectum ...	—	—	—	—	—	—	—	—	—
A.49	Malignant neoplasm of larynx ...	—	—	—	—	—	—	—	—	—
A.50	Malignant neoplasm of trachea, and of bronchus and lung not specified as secondary ...	—	—	—	—	—	—	—	—	—
A.51	Malignant neoplasm of breast ...	—	—	—	—	—	—	—	—	—
A.52	Malignant neoplasm of cervix uteri	—	—	—	—	—	—	—	—	—
A.53	Malignant neoplasm of other and unspecified parts of uterus ...	—	—	—	—	—	—	—	—	—
A.54	Malignant neoplasm of prostate ...	—	—	—	—	—	—	—	—	—
A.55	Malignant neoplasm of skin ...	—	—	—	—	—	—	—	—	—
A.56	Malignant neoplasm of bone and connective tissue ...	—	—	—	—	—	—	—	—	—
A.57	Malignant neoplasm of all other and unspecified sites ...	—	—	—	—	—	—	—	—	—
A.58	Leukaemia and aleukaemia ...	—	—	—	—	—	—	—	—	—
A.59	Lymphosarcoma and other neoplasms of lymphatic and haematopoietic system ...	—	—	—	—	—	—	—	—	—
A.60	Benign neoplasms and neoplasms of unspecified nature ...	—	—	—	—	—	—	—	—	—
A.61	Nontoxic goitre	—	—	—	—	—	—	—	—	—
A.62	Thyrototoxicosis with or without goitre	—	—	—	—	—	—	—	—	—
A.63	Diabetes mellitus	—	—	—	—	—	—	—	—	—
A.64(a)	Beriberi	—	2	4	—	—	6	—	—	—
(b)	Pellagra	—	9	10	—	—	19	—	—	4
(c)	Scurvy	—	—	—	—	—	—	—	25	16
(d)	Other deficiency states ...	2	70	74	20	11	146	15	626	626
A.65(a)	Pernicious and other hyperchromic anaemias	—	5	13	—	7	18	1	986	96
(b)	Iron deficiency anaemias (hypochromic)	—	2	11	—	3	13	5	958	943
(c)	Other specified and unspecified anaemias	—	2	3	—	—	5	1	1,220	1,144
A.66(a)	Asthma	—	1	1	—	—	2	—	274	244
A.66(b)	All other allergic disorders, endocrine, metabolic and blood diseases	—	1	—	1	—	1	—	9	6
A.67	Psychoses	—	—	—	—	—	—	—	—	—
A.68	Psychoneuroses and disorders of personality	—	—	—	—	—	—	—	—	—
A.69	Mental deficiency	—	—	—	—	—	—	—	5	9
A.70	Vascular lesions affecting central nervous system	—	—	—	—	—	—	—	—	—
A.71	Nonmeningococcal meningitis ...	—	3	—	1	—	3	2	3	3
A.72	Multiple sclerosis	—	—	—	—	—	—	—	—	—
A.73	Epilepsy	2	1	—	1	1	3	—	3	1
A.74	Inflammatory diseases of eye ...	—	2	—	—	—	2	—	233	231
A.75	Cataract	—	—	—	—	—	—	—	—	3
A.76	Glaucoma	—	—	—	—	—	—	—	48	51
A.77(a)	Otitis externa	—	—	—	—	—	—	—	74	57
(b)	Otitis media and mastoiditis ...	—	—	—	—	—	—	—	102	112
(c)	Other inflammatory diseases of the ear	—	—	—	—	—	—	—	44	39
A.78(a)	All other diseases and conditions of eye	—	—	—	—	—	—	—	56	61
(b)	All other diseases of the nervous system and sense organs ...	—	—	—	—	—	—	—	—	—
A.79	Rheumatic fever	—	—	—	—	—	—	—	1	—
A.80	Chronic rheumatic heart disease ...	—	—	—	—	—	—	—	—	—

RETURN "B"—*contd.*

INFANT CLINICS ONLY

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND DISEASES (OUT-PATIENTS)
FOR THE YEAR 1954

Inter- mediate List Number	Diseases	IN-PATIENTS						OUT-PATIENTS		
		Remaining in hospital on 31st Dec., 1953	Yearly Total				Total cases treated	Remaining in hospital on 31st Dec., 1954	Males	Females
			Admissions		Deaths					
			Males	Females	Males	Females				
A.81	Arteriosclerotic and degenerative heart disease	—	—	—	—	—	—	—	—	—
A.82	Other diseases of heart	—	—	—	—	—	—	—	—	1
A.83	Hypertension with heart disease	—	—	—	—	—	—	—	—	—
A.84	Hypertension without mention of heart	—	—	—	—	—	—	—	—	—
A.85	Diseases of arteries	—	—	—	—	—	—	—	—	—
A.86	Other diseases of circulatory system	—	—	—	—	—	—	—	—	—
A.87	Acute upper respiratory infections	—	1	—	—	—	1	1	1,176	1,263
A.88	Influenza	—	2	—	—	—	2	—	—	—
A.89	Lobar pneumonia	—	3	5	2	—	8	—	4	7
A.90	Broncho-pneumonia	1	10	11	6	5	22	—	258	259
A.91	Primary atypical, other and unspecified pneumonia	—	—	—	—	—	—	—	63	46
A.92	Acute Bronchitis	—	2	—	1	—	2	—	121	97
A.93	Bronchitis, chronic and unqualified	—	2	—	—	—	2	—	26	27
A.94	Hypertrophy of tonsils and adenoids	—	—	—	—	—	—	—	—	—
A.95	Empyema and abscess of lung	—	—	—	—	—	—	—	—	—
A.96	Pleurisy	—	1	2	1	—	3	—	—	—
A.97 (a)	Pneumoconiosis	—	—	—	—	—	—	—	—	—
A.97 (b)	All other respiratory diseases	—	—	—	—	—	—	—	272	269
A.98 (a)	Dental Caries	—	—	—	—	—	—	—	2	1
A.98 (b)	All other diseases of teeth and supporting structures	—	—	—	—	—	—	—	194	2
A.99	Ulcer of Stomach	—	—	—	—	—	—	—	—	—
A.100	Ulcer of duodenum	—	—	—	—	—	—	—	—	—
A.101	Gastritis and duodenitis	—	—	—	—	—	—	—	—	—
A.102	Appendicitis	—	—	—	—	—	—	—	—	—
A.103	Intestinal obstruction and hernia	—	—	—	—	—	—	—	1	—
A.104(a)	Gastro-enteritis and colitis between 4 weeks and 2 years	14	29	6	5	4	49	3	280	238
(b)	Gastro-enteritis and colitis, ages 2 years and over	1	—	—	—	—	1	—	134	118
(c)	Chronic enteritis and ulcerative colitis	—	—	—	—	—	—	—	81	72
A.105	Cirrhosis of liver	—	6	2	2	—	8	—	275	270
A.106	Cholelithiasis and cholecystitis	—	—	—	—	—	—	—	35	47
A.107	Other diseases of digestive system.	—	1	—	—	—	1	—	44	49
A.108	Acute nephritis	—	—	—	—	—	—	—	19	17
A.109	Chronic, other and unspecified nephritis	—	—	—	—	—	—	—	—	—
A.110	Infections of kidney	—	—	—	—	—	—	—	—	—
A.111	Calculi of urinary system	—	—	—	—	—	—	—	—	—
A.112	Hyperplasia of prostate	—	—	—	—	—	—	—	—	—
A.113	Diseases of Breast	—	—	—	—	—	—	—	—	—
A.114(a)	Hydrocele	—	—	—	—	—	—	—	2	—
(b)	Disorders of menstruation	—	—	—	—	—	—	—	—	1
(c)	All other diseases of the genito-urinary system	—	—	—	—	—	—	—	5	20
A.115	Sepsis of pregnancy, childbirth and the puerperium	—	—	—	—	—	—	—	—	—
A.116	Toxaemias of pregnancy and the puerperium	—	—	—	—	—	—	—	—	—
A.117	Haemorrhage of pregnancy and childbirth	—	—	1	—	—	1	—	—	—
A.118	Abortion without mention of sepsis or toxæmia	—	—	—	—	—	—	—	—	—
A.119	Abortion with sepsis	—	—	—	—	—	—	—	—	—
A.120(a)	Other complications of pregnancy, childbirth and the puerperium	—	—	—	—	—	—	—	—	—
(b)	Delivery without complications	—	—	—	—	—	—	—	—	—
A.121	Infections of skin and subcutaneous tissue	—	—	—	—	—	—	—	52	33
A.122	Arthritis and spondylitis	—	—	—	—	—	—	—	—	—
A.123	Muscular rheumatism and rheumatism, unspecified	—	—	6	—	—	6	2	62	52
A.124	Osteomyelitis and periostitis	—	—	—	—	—	—	—	9	7
A.125	Ankylosis and acquired musculoskeletal deformities	—	—	—	—	—	—	—	—	—
A.126(a)	Chronic Ulcer of skin (including tropical ulcer)	—	—	1	—	1	1	—	46	35
A.126(b)	All other diseases of skin	6	1	2	—	—	9	—	485	334
(c)	All other diseases of musculoskeletal system	—	—	—	—	—	—	—	4	2
A.127	Spina bifida and meningocele	—	—	—	—	—	—	—	—	—

RETURN "B"—*contd.*

INFANT CLINICS ONLY

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND DISEASES (OUT-PATIENTS)
FOR THE YEAR 1954

Inter- mediate List Number	Diseases	IN-PATIENTS							OUT-PATIENTS	
		Remaining in hospital on 31st Dec., 1953	Yearly Total				Total cases treated	Remaining in hospital on 31st Dec., 1954	Males	Females
			Admissions		Deaths					
			Males	Females	Males	Females				
A.128	Congenital malformations of cir- culatory system	—	—	—	—	—	—	—	1	1
A.129	All other congenital malforma- tions	—	—	1	—	—	1	—	25	21
A.130	Birth injuries	—	—	2	—	2	2	—	2	4
A.131	Postnatal asphyxia and atelec- tasis	—	—	—	—	—	—	—	—	—
A.132(a)	Diarrhoea of newborn (under 4 weeks)	—	3	2	3	2	5	—	36	3
(b)	Ophthalmia neonatorum ...	3	—	—	—	—	3	—	106	100
(c)	Other infections of newborn ...	2	3	2	1	—	7	1	188	173
A.133	Haemolytic disease of newborn ...	—	—	—	—	—	—	—	13	3
A.134	All other defined diseases of early infancy	2	13	12	4	6	27	2	38	35
A.135	Ill-defined diseases peculiar to early infancy, and immaturity unqualified	14	—	—	—	—	14	—	117	106
136	Senility without mention of psychosis	—	1	—	—	—	1	—	—	—
A.137(a)	Pyrexia of unknown origin ...	—	1	1	—	—	2	—	396	309
(b)	Observation without need for further medical care ...	—	9	15	—	—	24	—	163	183
(c)	All other ill-defined causes of morbidity	—	1	1	—	—	2	—	217	232
	<i>Total ...</i>	53	289	280	76	60	622	47	19,237	18,259

Inter- mediate List Number	Accidents, Poisoning and Violence (External cause)	IN-PATIENTS							OUT-PATIENTS	
		Remaining in hospital on 31st Dec., 1953	Yearly Total				Total cases treated	Remaining in hospital on 31st Dec., 1954	Males	Females
			Admissions		Deaths					
			Males	Females	Males	Females				
AE.138	Motor vehicle accidents ...	—	—	—	—	—	—	—	—	—
AE.139	Other transport accidents ...	—	—	—	—	—	—	—	—	—
AE.140	Accidental poisoning ...	—	—	—	—	—	—	14	5	
AE.141	Accidental falls ...	—	2	1	—	—	3	21	14	
AE.142	Accidents caused by machinery	—	—	—	—	—	—	—	—	—
AE.143	Accidents caused by fire and explosion of combustible material ...	—	—	—	—	—	—	16	21	
AE.144	Accidents caused by hot sub- stance, corrosive liquid, steam and radiation ...	—	—	—	—	—	—	25	25	
AE.145	Accident caused by firearm ...	—	—	—	—	—	—	—	—	—
AE.146	Accidental drowning and sub- mersion ...	—	—	—	—	—	—	—	—	—
AE.147	(a) Foreign body entering eye and adnexa ...	—	—	—	—	—	—	—	—	1
	(b) Foreign body entering other orifice ...	—	—	—	—	—	—	—	—	—
	(c) Accidents caused by bites and stings of venomous animals and insects ...	—	—	—	—	—	—	6	4	
	(d) Other accidents caused by animals ...	—	—	—	—	—	—	1	—	—
	(e) All other accidental causes ...	—	—	—	—	—	—	24	7	—
AE.148	Suicide and self-inflicted injury	—	—	—	—	—	—	—	—	—
AE.149	Homicide and injury purposely inflicted by other persons (not in war) ...	—	—	—	—	—	—	—	—	—
AE.150	Injury resulting from operations of war ...	—	—	—	—	—	—	—	—	—
	<i>Total ...</i>	—	2	1	—	—	3	—	107	77

RETURN "B"—*contd.*

INFANTS CLINICS ONLY

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND DISEASES (OUT-PATIENTS)
FOR THE YEAR 1954

Inter- mediate List Number	Accidents, Poisoning and Violence (Nature of injury)	IN-PATIENTS							OUT-PATIENTS	
		Remaining in hospital on 31st Dec., 1953	Yearly Total				Total cases treated	Remaining in hospital on 31st Dec., 1954	Males	Females
			Admissions		Deaths					
			Males	Females	Males	Females				
AN.138	Fracture of skull	—	—	—	—	—	—	—	—	—
AN.139	Fracture of spine and trunk ...	—	—	—	—	—	—	—	—	—
AN.140	Fracture of limbs	—	—	—	—	—	—	7	—	3
AN.141	Dislocation without fracture ...	—	2	1	—	—	3	—	—	—
AN.142	Sprains and strains of joints and adjacent muscle	—	—	—	—	—	—	—	—	2
AN.143	Head injury (excluding skull fracture)	—	—	—	—	—	—	14	—	5
AN.144	Internal injury of chest, abdo- men, and pelvis	—	—	—	—	—	—	1	—	—
AN.145	Laceration and open wounds ...	—	—	—	—	—	—	16	—	9
AN.146	Superficial injury, contusion and crushing with intact skin surface	—	—	—	—	—	—	14	—	8
AN.147	Effects of foreign body entering through orifice	—	—	—	—	—	—	—	—	—
AN.148	Burns	—	—	—	—	—	—	41	—	45
AN.149	Effects of poisons	—	—	—	—	—	—	14	—	5
AN.150	All other and unspecified effects of external causes	—	—	—	—	—	—	—	—	—
	<i>Total</i> ...	—	2	1	—	—	3	—	107	77
	GRAND TOTAL ...	53	291	281	76	60	625	47	19,344	18,336

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND DISEASES (OUT-PATIENTS)
FOR THE YEAR 1954

Inter- mediate List Number	Diseases	IN-PATIENTS						OUT-PATIENTS		
		Remaining in hospital on 31st Dec., 1953	Yearly Total				Total cases treated	Remaining in hospital on 31st Dec., 1954	Males	Females
			Admissions		Deaths					
			Males	Females	Males	Females				
A.1	T.B. of respiratory system ...	—	—	—	—	—	—	8	3	
A.2	T.B. of meninges and central nervous system ...	—	—	—	—	—	—	—	—	
A.3	T.B. of intestines peritoneum and mesenteric glands ...	—	—	—	—	—	—	—	—	
A.4	T.B. of bones and joints ...	—	—	—	—	—	—	—	—	
A.5	T.B. all other forms ...	—	—	—	—	—	—	—	—	
A.6	Congenital Syphilis ...	—	—	—	—	—	—	1	—	
A.7	Early Syphilis ...	—	—	—	—	—	—	—	—	
A.8	Tabes dorsalis ...	—	—	—	—	—	—	—	—	
A.9	General paralysis of insane ...	—	—	—	—	—	—	—	—	
A.10	All other Syphilis ...	—	—	—	—	—	—	3	4	
A.11	Gonococcal infections ...	—	—	—	—	—	—	162	33	
A.12	Typhoid fever ...	—	—	—	—	—	—	—	—	
A.13	Paratyphoid fever and other salmonella infections ...	—	—	—	—	—	—	—	—	
A.14	Cholera ...	—	—	—	—	—	—	—	—	
A.15	Brucellosis (undulant fever) ...	—	—	—	—	—	—	—	—	
A.16 (a)	Bacillary dysentery ...	—	—	—	—	—	—	—	—	
(b)	Amoebiasis ...	—	4	1	—	5	—	10	20	
(c)	Other unspecified forms of dysentery ...	—	3	6	—	1	9	229	133	
A.17	Scarlet fever ...	—	—	—	—	—	—	—	—	
A.18	Streptococcal sore throat ...	—	1	1	—	2	—	29	56	
A.19	Erysipelas ...	—	—	—	—	—	—	—	—	
A.20	Septicaemia and pyaemia ...	—	—	—	—	—	—	—	—	
A.21	Diphtheria ...	—	—	—	—	—	—	—	—	
A.22	Whooping Cough ...	—	—	1	—	1	—	63	78	
A.23	Meningococcal infections ...	—	4	1	—	5	—	1	2	
A.24	Plague ...	—	—	—	—	—	—	—	—	
A.25	Leprosy ...	—	—	—	—	—	—	24	12	
A.26	Tetanus ...	—	1	1	—	2	—	4	8	
A.27	Anthrax ...	—	—	—	—	—	—	—	—	
A.28	Acute poliomyelitis ...	—	—	—	—	—	—	—	—	
A.29	Acute infectious encephalitis ...	—	—	—	—	—	—	—	—	
A.30	Late effect of acute poliomyelitis and acute infectious enceph- alitis ...	—	—	—	—	—	—	—	—	
A.31	Smallpox ...	—	—	—	—	—	—	1	—	
A.32	Measles ...	—	2	1	—	3	—	314	273	
A.33	Yellow Fever ...	—	—	—	—	—	—	—	—	
	Ante Natal ...	—	—	—	—	—	—	—	1,365	
A.34	Infectious hepatitis ...	—	—	—	—	—	—	4	8	
A.35	Rabies ...	—	—	—	—	—	—	—	—	
A.36 (a)	Louse-borne epidemic typhus ...	—	—	—	—	—	—	—	—	
(b)	Flea-borne endemic typhus (murine) ...	—	—	—	—	—	—	—	—	
(c)	Tick-borne epidemic typhus ...	—	—	—	—	—	—	—	—	
(d)	Mite-borne typhus ...	—	—	—	—	—	—	—	—	
(e)	Other and unspecified typhus ...	—	—	—	—	—	—	—	—	
A.37 (a)	Vivax malaria (benign tertian) ...	—	—	—	—	—	—	—	—	
(b)	Malariae malaria (quartan) ...	—	—	—	—	—	—	—	—	
(c)	Falciparum malaria (malignant tertian) ...	—	—	—	—	—	—	—	—	
(d)	Blackwater fever ...	—	2	—	—	2	—	—	—	
(e)	Other and unspecified forms of malaria ...	—	30	40	1	5	70	2,609	3,196	
A.38 (a)	Schistosomiasis vesical (s. haematobium) ...	—	—	—	—	—	—	10	41	
(b)	Schistosomiasis intestinal (S. mansoni) ...	—	—	—	—	—	—	—	—	
(c)	Schistosomiasis pulmonary (s. Japonicum) ...	—	—	—	—	—	—	—	—	
(d)	Other and unspecified Schisto- somiasis ...	—	—	—	—	—	—	—	—	
A.39	Hydatid disease ...	—	—	—	—	—	—	—	—	
A.40 (a)	Onchocerciasis ...	—	—	—	—	—	—	—	—	
(b)	Loiasis ...	—	—	—	—	—	—	—	—	
(c)	Filariasis (bancrofti) ...	—	—	—	—	—	—	—	—	
(d)	Other filariasis ...	—	—	—	—	—	—	—	—	
A.41	Ankylostomiasis ...	—	1	1	—	2	—	23	154	
A.42 (a)	Tapeworm (infestation) and other cestode infestations ...	—	—	—	—	—	—	—	2	
(b)	Ascariasis ...	—	—	—	—	—	—	190	288	
(c)	Guinea worm (dracunculosis) ...	—	—	1	—	1	—	17	29	
(d)	Other diseases due to helminths ...	—	—	—	—	—	—	35	36	
A.43 (a)	Lymphogranuloma venereum ...	—	—	—	—	—	—	—	—	
(b)	Granuloma inguinale, venereal ...	—	—	—	—	—	—	—	—	
(c)	Other and unspecified venereal diseases ...	—	—	—	—	—	—	1	1	
(d)	Food poisoning infection and intoxication ...	—	—	—	—	—	—	2	1	
(e)	Relapsing Fever ...	—	—	—	—	—	—	—	—	

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND DISEASES (OUT-PATIENTS)
FOR THE YEAR 1954

Intermediate List Number	Diseases	IN-PATIENTS						OUT-PATIENTS		
		Remaining in hospital on 31st Dec., 1953	Yearly Total				Total cases treated	Remaining in hospital on 31st Dec., 1954	Males	Females
			Admissions		Deaths					
			Males	Females	Males	Females				
A.43 (f)	Leptospirosis icterohaemorrhagica (Weil's disease)	—	—	—	—	—	—	—	—	—
(g)	Yaws	—	—	—	—	—	—	5,236	3,976	
(h)	Chickenpox	—	—	—	—	—	—	7	11	
(i)	Dengue	—	—	—	—	—	—	—	—	
(j)	Trachoma	—	—	—	—	—	—	1	—	
(k)	Sandfly fever	—	—	—	—	—	—	—	—	
(l)	Leishmaniasis	—	—	—	—	—	—	—	—	
(m)	Trypanosomiasis gambiensis ...	—	—	—	—	—	—	—	—	
	Trypanosomiasis rhodesiensis ...	—	—	—	—	—	—	—	—	
	Other and unspecified Trypanosomiasis	—	—	—	—	—	—	—	—	
(n)	Dermatophytosis	—	—	—	—	—	—	346	326	
(o)	Scabies	—	—	—	—	—	—	—	—	
(p)	All other diseases classified as infective and parasitic ...	—	—	—	—	—	—	—	—	
A.44	Malignant neoplasm of buccal cavity and pharynx	—	—	—	—	—	—	—	—	
A.45	Malignant neoplasm of oesophagus	—	—	—	—	—	—	—	—	
A.46	Malignant neoplasm of stomach ...	—	—	—	—	—	—	—	—	
A.47	Malignant neoplasm of intestines except rectum	—	—	—	—	—	—	—	—	
A.48	Malignant neoplasm of rectum ...	—	—	—	—	—	—	—	—	
A.49	Malignant neoplasm of larynx ...	—	—	—	—	—	—	—	—	
A.50	Malignant neoplasm of trachea, and of bronchus and lung not specified as secondary ...	—	—	—	—	—	—	—	—	
A.51	Malignant neoplasm of breast ...	—	—	—	—	—	—	—	—	
A.52	Malignant neoplasm of cervix uteri	—	—	—	—	—	—	—	—	
A.53	Malignant neoplasm of other and unspecified parts of uterus ...	—	—	—	—	—	—	—	—	
A.54	Malignant neoplasm of prostate ...	—	—	—	—	—	—	—	—	
A.55	Malignant neoplasm of skin	—	—	—	—	—	—	—	—	
A.56	Malignant neoplasm of bone and connective tissue	—	—	—	—	—	—	—	—	
A.57	Malignant neoplasm of all other and unspecified sites	—	—	—	—	—	—	—	—	
A.58	Leukaemia and aleukaemia	—	—	—	—	—	—	—	—	
A.59	Lymphosarcoma and other neoplasms of lymphatic and haematopoietic system	—	—	—	—	—	—	—	—	
A.60	Benign neoplasms and neoplasms of unspecified nature ...	—	—	—	—	—	—	—	—	
A.61	Nontoxic goitre	—	—	—	—	—	—	1	1	
A.62	Thyrotoxicosis with or without goitre	—	—	—	—	—	—	—	—	
A.63	Diabetes mellitus	—	—	—	—	—	—	—	—	
A.64 (a)	Beriberi	—	—	—	—	—	—	4	1	
(b)	Pellagra	—	—	—	—	—	—	1	2	
(c)	Scurvy	—	—	—	—	—	—	164	190	
(d)	Other deficiency states	—	5	3	—	8	—	—	—	
A.65 (a)	Pernicious and other hyperchromic anaemias	—	—	—	—	—	—	—	—	
(b)	Iron deficiency anaemias (hypochromic)	—	—	—	—	—	—	—	—	
(c)	Other specified and unspecified anaemias	—	3	4	—	1	7	99	220	
A.66 (a)	Asthma	—	—	—	—	—	—	14	13	
(b)	All other allergic disorders, endocrine, metabolic and blood diseases	—	—	—	—	—	—	65	124	
A.67	Psychoses	—	—	—	—	—	—	1	1	
A.68	Psychoneuroses and disorders of personality	—	—	—	—	—	—	—	—	
A.69	Mental Deficiency	—	—	—	—	—	—	—	—	
A.70	Vascular lesions affecting central nervous system	—	—	—	—	—	—	—	—	
A.71	Nonmeingococcal meningitis ...	—	—	—	—	—	—	—	—	
A.72	Multiple sclerosis	—	—	—	—	—	—	—	—	
A.73	Epilepsy	—	—	—	—	—	—	—	2	
A.74	Inflammatory diseases of eye ...	—	—	—	—	—	—	161	108	
A.75	Cataract	—	—	—	—	—	—	3	—	
A.76	Glaucoma	—	—	—	—	—	—	1	—	
A.77 (a)	Otitis externa	—	—	—	—	—	—	23	31	
(b)	Otitis media and mastoiditis ...	—	—	—	—	—	—	32	35	
(c)	Other inflammatory diseases of the ear	—	—	—	—	—	—	172	208	
A.78 (a)	All other diseases and conditions of eye	—	—	—	—	—	—	49	51	
(b)	All other diseases of the nervous system and sense organs ...	—	—	—	—	—	—	—	—	
A.79	Rheumatic fever	—	—	1	—	—	1	—	—	
A.80	Chronic rheumatic heart disease ...	—	—	—	—	—	—	—	—	

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND DISEASES (OUT-PATIENTS)
FOR THE YEAR 1954

Intermediate List Number	Diseases	IN-PATIENTS						OUT-PATIENTS		
		Remaining in hospital on 31st Dec., 1953	Yearly Total				Total cases treated	Remaining in hospital on 31st Dec., 1954	Males	Females
			Admissions		Deaths					
			Males	Females	Males	Females				
A.81	Arteriosclerotic and degenerative heart disease	—	—	—	—	—	—	—	—	
A.82	Other diseases of heart	—	—	—	—	—	—	12	36	
A.83	Hypertension with heart disease	—	—	—	—	—	—	—	3	
A.84	Hypertension without mention of heart	—	—	—	—	—	—	4	—	
A.85	Diseases of Arteries	—	—	—	—	—	—	—	—	
A.86	Other diseases of circulatory system	—	—	—	—	—	—	—	—	
A.87	Acute upper respiratory infections	—	—	—	—	—	—	391	224	
A.88	Influenza	—	—	—	—	—	—	4	7	
A.89	Lobar pneumonia	—	—	3	—	—	3	7	7	
A.90	Broncho-pneumonia	—	4	7	—	—	11	24	25	
A.91	Primary atypical, other and unspecified pneumonia	—	17	7	5	1	24	81	109	
A.92	Acute Bronchitis	—	1	6	—	—	7	751	936	
A.93	Bronchitis, chronic and unqualified	—	—	—	—	—	—	6	3	
A.94	Hypertrophy of tonsils and adenoids	—	—	—	—	—	—	—	—	
A.95	Empyema and abscess of lung	—	—	—	—	—	—	—	—	
A.96	Pleurisy	—	3	2	—	—	5	8	7	
A.97 (a)	Pneumoconiosis	—	—	—	—	—	—	—	—	
(b)	All other respiratory diseases	—	—	—	—	—	—	—	—	
A.98 (a)	Dental Caries	—	—	—	—	—	—	48	46	
(b)	All other diseases of teeth and supporting structures	—	—	—	—	—	—	244	365	
A.99	Ulcer of Stomach	—	—	—	—	—	—	—	—	
A.100	Ulcer of Duodenum	—	—	—	—	—	—	—	—	
A.101	Gastritis and duodenitis	—	—	—	—	—	—	—	—	
A.102	Appendicitis	—	—	—	—	—	—	—	—	
A.103	Intestinal obstruction and hernia	—	—	—	—	—	—	—	—	
A.104(a)	Gastro-enteritis and colitis between 4 weeks and 2 years	—	—	—	—	—	—	230	259	
(b)	Gastro-enteritis and colitis, ages 2 years and over	—	5	5	—	—	10	374	442	
(c)	Chronic enteritis and ulcerative colitis	—	—	—	—	—	—	—	—	
A.105	Cirrhosis of liver	—	—	—	—	—	—	—	—	
A.106	Cholelithiasis and cholecystitis	—	—	—	—	—	—	—	—	
A.107	Other diseases of digestive system	—	1	1	—	—	2	165	102	
A.108	Acute nephritis	—	—	—	—	—	—	1	1	
A.109	Chronic, other and unspecified nephritis	—	3	3	—	—	6	4	6	
A.110	Infections of kidney	—	—	1	—	—	1	—	—	
A.111	Calculi of urinary system	—	—	—	—	—	—	—	—	
A.112	Hyperplasia of prostate	—	—	—	—	—	—	—	—	
A.113	Diseases of Breast	—	—	1	—	—	1	—	29	
A.114 (a)	Hydrocele	—	—	—	—	—	—	2	—	
(b)	Disorders of menstruation	—	—	—	—	—	—	—	187	
(c)	All other diseases of the genito-urinary system	—	—	4	—	—	4	—	56	
A.115	Sepsis of pregnancy, childbirth and the puerperium	—	—	12	—	—	12	—	4	
A.116	Toxaemias of pregnancy and the puerperium	—	—	1	—	—	1	—	1	
A.117	Haemorrhage of pregnancy and childbirth	—	—	24	—	—	24	—	53	
A.118	Abortion without mention of sepsis or toxæmia	—	—	17	—	—	17	—	81	
A.119	Abortion with sepsis	—	—	—	—	—	—	—	—	
A.120 (a)	Other complications of pregnancy, childbirth and the puerperium	—	—	21	—	—	21	—	20	
(b)	Delivery without complications	—	—	225	—	—	225	—	396	
A.121	Infections of skin and sub-cutaneous tissue	—	2	8	—	—	10	381	336	
A.122	Arthritis and spondylitis	—	—	—	—	—	—	—	—	
A.123	Muscular rheumatism and rheumatism, unspecified	—	—	—	—	—	—	356	403	
A.124	Osteomyelitis and periostitis	—	—	—	—	—	—	3	—	
A.125	Ankylosis and acquired musculo-skeletal deformities	—	—	—	—	—	—	—	—	
A.126 (a)	Chronic Ulcer of Skin (including tropical ulcer)	—	1	3	—	—	4	398	388	
(b)	All other diseases of skin	—	—	1	—	—	1	770	170	
(c)	All other diseases of musculo-skeletal system	—	—	—	—	—	—	—	7	
A.127	Spina bifida and meningocele	—	—	—	—	—	—	—	—	
A.128	Congenital malformations of circulatory system	—	—	—	—	—	—	—	—	

RETURN "C"—*contd.*

MISSION AND GOVERNMENT HEALTH CENTRES

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND DISEASES(OUT-PATIENTS)
FOR THE YEAR 1954

Inter- mediate List Number	Diseases	IN-PATIENTS							OUT-PATIENTS	
		Remaining in hospital on 31st Dec., 1953	Yearly Total				Total cases treated	Remaining in hospital on 31st Dec., 1954	Males	Female
			Admissions		Deaths					
			Males	Females	Males	Females				
A.129	All other congenital malforma- tions	—	2	3	—	—	5	—	—	—
A.130	Birth injuries	—	—	—	—	—	—	—	—	—
A.131	Postnatal asphyxia and atelec- tasis	—	17	14	—	—	31	—	—	—
A.132 (a)	Diarrhoea of newborn (under 4 weeks)	—	—	—	—	—	—	—	—	—
(b)	Ophthalmia neonatorum	—	—	—	—	—	—	—	10	9
(c)	Other infections of newborn	—	1	3	—	—	4	—	11	16
A.133	Haemolytic disease of newborn	—	—	—	—	—	—	—	—	—
A.134	All other defined diseases of early infancy	—	—	—	—	—	—	—	—	—
A.135	Ill-defined diseases peculiar to early infancy, and immaturity unqualified	—	—	—	—	—	—	—	—	—
A.136	Senility without mention of psychosis	—	—	—	—	—	—	—	—	—
A.137 (a)	Pyrexia of unknown origin	—	—	—	—	—	—	—	16	21
(b)	Observation without need for further medical care	—	—	—	—	—	—	—	—	—
(c)	All other ill-defined causes of morbidity	—	—	—	—	—	—	—	—	—
	Total	—	113	434	6	8	547	—	14,419	15,797

Inter- mediate List Number	Accidents, Poisonings and Violence (External cause)	IN-PATIENTS							OUT-PATIENTS	
		Remaining in hospital on 31st Dec., 1953	Yearly Total				Total cases treated	Remaining in hospital on 31st Dec., 1954	Males	Females
			Admissions		Deaths					
			Males	Females	Males	Females				
AE.138	Motor vehicle accidents ...	—	1	—	1	—	1	—	39	18
AE.139	Other transport accidents ...	—	3	1	—	—	4	—	57	27
AE.140	Accidental poisoning	—	4	7	1	—	11	—	—	60
AE.141	Accidental falls	—	1	—	—	—	1	—	105	36
AE.142	Accidents caused by machinery	—	—	—	—	—	—	—	44	—
AE.143	Accidents caused by fire and explosion of combustible material	—	—	—	—	—	—	—	8	11
AE.144	Accidents caused by hot sub- stance, corrosive liquid, steam and radiation ...	—	—	1	—	—	1	—	16	22
AE.145	Accident caused by firearm ...	—	—	—	—	—	—	—	—	—
AE.146	Accidental drowning and sub- mersion	—	—	—	—	—	—	—	—	—
AE.147		—	—	—	—	—	—	—	—	—
(a)	Foreign body entering eye and adnexa	—	—	—	—	—	—	—	3	4
(b)	Foreign body entering other orifice	—	—	—	—	—	—	—	8	7
(c)	Accidents caused by bites and stings of venomous animals and insects	—	—	—	—	—	—	—	60	55
(d)	Other accidents caused by animals	—	—	—	—	—	—	—	40	8
(e)	All other accidental causes ...	—	—	—	—	—	—	—	—	—
AE.148	Suicide and self-inflicted injury	—	—	—	—	—	—	—	—	—
AE.149	Homicide and injury purposely inflicted by other persons (not in war)	—	—	—	—	—	—	—	10	5
AE.150	Injury resulting from operations of war	—	—	—	—	—	—	—	—	—
	<i>Total</i> ...	—	9	9	2	—	18	—	390	253

RETURN "C"—*contd.*

MISSION AND GOVERNMENT HEALTH CENTRES

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND DISEASES
(OUT-PATIENTS) FOR THE YEAR 1954—*contd.*

Inter- mediate List Number	Accidents, Poisonings and Violence (Nature of Injury)	IN-PATIENTS							OUT-PATIENTS	
		Remaining in hospital on 31st Dec., 1953	Yearly Total				Total cases treated	Remaining in hospital on 31st Dec., 1954	Males	Females
			Admissions		Deaths					
			Males	Females	Males	Females				
AN.138	Fracture of skull	—	—	—	—	—	—	—	—	—
AN.139	Fracture of spine and trunk ...	—	—	—	—	—	—	—	—	—
AN.140	Fracture of limbs	—	—	—	—	—	—	2	2	
AN.141	Dislocation without fracture ...	—	—	—	—	—	—	1	2	
AN.142	Sprains and strains of joints and adjacent muscle	—	—	—	—	—	—	34	17	
AN.143	Head injury (excluding skull fracture)	—	—	—	—	—	—	12	6	
AN.144	Internal injury of chest, abdo- men, and pelvis	—	—	—	—	—	—	—	—	—
AN.145	Laceration and open wounds ...	—	3	1	—	—	4	—	138	112
AN.146	Superficial injury, contusion and crushing with intact skin surface	—	1	—	1	—	1	—	107	14
AN.147	Effects of foreign body entering through orifice	—	—	1	—	—	1	—	11	11
AN.148	Burns	—	4	7	1	—	11	—	24	33
AN.149	Effects of poisons	—	—	—	—	—	—	—	27	21
AN.150	All other and unspecified effects of external causes	—	1	—	—	—	1	—	34	35
	<i>Total</i> ...	—	9	9	2	—	18	—	390	253
	<i>Grand Total</i> ...	—	122	443	8	8	565	—	14,809	16,050

RETURN "D"

ISOLATION HOSPITALS

Inter- mediate List Number	Diseases	IN-PATIENTS							OUT-PATIENTS	
		Remaining in hospital on 31st Dec., 1953	Yearly Total				Remaining in hospital on 31st Dec., 1954	Males	Females	
			Admissions		Deaths					Total cases treated
			Males	Females	Males	Females				
A.14	Cholera	—	—	—	—	—	—	—	—	—
A.22	Whooping cough	—	—	—	—	—	—	—	—	—
A.23	Cerebro-spinal meningitis	—	—	—	—	—	—	—	—	—
A.24	Plague	—	—	—	—	—	—	—	—	—
A.31	Smallpox	—	23	15	2	2	38	—	—	1
A.32	Measles	—	—	—	—	—	—	—	—	—
A.33	Yellow Fever	—	—	—	—	—	—	—	—	—
A.43(e)	Relapsing Fever	—	—	—	—	—	—	—	—	—
A.43(h)	Chicken Pox	3	56	13	—	—	72	—	49	25
A.43(o)	Scabies	—	2	1	—	—	3	—	—	—
	Total ...	3	81	29	2	2	113	—	49	26

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND DISEASES (OUT-PATIENTS)
FOR THE YEAR 1954

Intermediate List Number	Diseases	IN-PATIENTS						OUT-PATIENTS		
		Remaining in hospital on 31st Dec., 1953	Yearly Total				Total cases treated	Remaining in hospital on 31st Dec., 1954	Males	Females
			Admissions		Deaths					
			Males	Females	Males	Females				
A.43 (g)	Yaws	—	—	—	—	—	—	714	103	
(h)	Chickenpox	—	26	1	—	—	27	20	—	
(i)	Dengue	—	—	—	—	—	—	5	—	
(j)	Trachoma	—	—	—	—	—	—	—	—	
(k)	Sandfly Fever	—	—	—	—	—	—	—	—	
(l)	Leishmaniasis	—	—	—	—	—	—	—	—	
(m)	Trypanosomiasis gambiensiis ...	5	4	—	—	—	4	6	—	
	Trypanosomiasis rhodensiensis	—	—	—	—	—	—	—	—	
	Other and unspecified Trypano- somiasis	—	—	—	—	—	—	—	—	
(n)	Dermatophytosis	—	—	—	—	—	—	3	—	
(o)	Scabies	—	—	—	—	—	—	228	4	
(p)	All other diseases classified as infective and parasitic ...	—	—	—	—	—	—	22	—	
A.44	Malignant neoplasm of buccal cavity and pharynx	—	—	—	—	—	—	—	—	
A.45	Malignant neoplasm of oeso- phagus	—	—	—	—	—	—	—	—	
A.46	Malignant neoplasm of stomach	—	—	—	—	—	—	—	—	
A.47	Malignant neoplasm of intestines except rectum ...	—	—	—	—	—	—	1	—	
A.48	Malignant neoplasm of rectum	1	1	—	—	—	2	—	—	
A.49	Malignant neoplasm of larynx	—	—	—	—	—	—	—	—	
A.50	Malignant neoplasm of trachea, and of bronchus and lung not specified as secondary ...	—	—	—	—	—	—	—	—	
A.51	Malignant neoplasm of breast	—	—	—	—	—	—	—	—	
A.52	Malignant neoplasm of cervix uteri	—	—	—	—	—	—	—	—	
A.53	Malignant neoplasm of other and unspecified parts of uterus	—	—	—	—	—	—	—	—	
A.54	Malignant neoplasm of prostate	—	—	—	—	—	—	—	—	
A.55	Malignant neoplasm of skin	—	—	—	—	—	—	—	—	
A.56	Malignant neoplasm of bone and connective tissue ...	—	—	—	—	—	—	—	—	
A.57	Malignant neoplasm of all other and unspecified sites ...	—	—	—	—	—	—	—	—	
A.58	Leukaemia and aleukaemia ...	—	—	—	—	—	—	—	—	
A.59	Lymphosarcoma and other neo- plasms of lymphatic and hae- matopoietic system	—	—	—	—	—	—	—	—	
A.60	Benign neoplasms and neoplasms of unspecified nature ...	—	—	—	—	—	—	—	—	
A.61	Nontoxic goitre	—	—	—	—	—	—	—	—	
A.62	Thyrotoxicosis with or without goitre	—	—	—	—	—	—	—	—	
A.63	Diabetes mellitus	—	—	—	—	—	—	—	—	
A.64 (a)	Beriberi	—	—	—	—	—	—	—	—	
(b)	Pellagra	—	—	—	—	—	—	—	—	
(c)	Scurvy	—	—	—	—	—	—	—	—	
(d)	Other deficiency states ...	—	1	1	—	—	2	8	—	
A.65 (a)	Pernicious and other hyper- chromic anaemias	—	—	—	—	—	—	—	—	
(b)	Iron deficiency anaemias (hypochromic)	—	—	—	—	—	—	113	46	
(c)	Other specified and unspecified anaemias	—	—	—	—	—	—	17	—	
A.66 (a)	Asthma	—	7	—	—	—	7	32	—	
(b)	All other allergic disorders, endocrine, metabolic and blood diseases	—	—	—	—	—	—	—	—	
A.67	Psychoses	—	—	—	—	—	—	—	—	
A.68	Psychoneuroses and disorders of personality	—	—	—	—	—	—	—	—	
A.69	Mental deficiency	—	1	—	—	—	1	2	—	
A.70	Vascular lesions affecting central nervous system	—	—	1	—	—	1	1	—	
A.71	Nonmeningococcal meningitis	—	—	—	—	—	—	—	—	
A.72	Multiple sclerosis	—	—	—	—	—	—	34	—	
A.73	Epilepsy	—	5	—	—	—	5	297	13	
A.74	Inflammatory diseases of eye ...	—	8	3	—	—	11	13	—	
A.75	Cataract	—	—	—	—	—	—	—	—	
A.76	Glaucoma	—	—	—	—	—	—	216	—	
A.77 (a)	Otitis externa	—	—	—	—	—	—	100	—	
(b)	Otitis media and mastoiditis ...	—	5	—	—	—	5	—	—	
(c)	Other inflammatory diseases of the ear	—	—	—	—	—	—	6	—	
A.78 (a)	All other diseases and conditions of eye	—	—	—	—	—	—	34	—	
(b)	All other diseases of the nervous system and sense organs ...	—	—	—	—	—	—	17	—	
A.79	Rheumatic fever	—	—	—	—	—	—	3	—	

RETURN "E"—*contd.*

HER MAJESTY'S PRISONS

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND DISEASES (OUT-PATIENTS)
FOR THE YEAR 1954

Inter- mediate List Number	Diseases	IN-PATIENTS							OUT-PATIENTS	
		Remaining in hospital on 31st Dec., 1953	Yearly Total				Total cases treated	Remaining in hospital on 31st Dec., 1954	Males	Females
			Admissions		Deaths					
			Males	Females	Males	Females				
A.80	Chronic rheumatic heart disease	—	—	—	—	—	—	—	—	
A.81	Arteriosclerotic and degenerative heart disease	—	—	—	—	—	—	—	—	
A.82	Other diseases of heart	—	3	—	—	3	—	—	—	
A.83	Hypertension with heart disease	—	2	—	—	2	—	—	—	
A.84	Hypertension without mention of heart	—	—	—	—	—	—	—	—	
A.85	Diseases of arteries	—	—	—	—	—	—	—	—	
A.86	Other diseases of circulatory system	—	—	—	—	—	—	5	—	
A.87	Acute upper respiratory infections	—	—	—	—	—	—	85	—	
A.88	Influenza	—	—	—	—	—	—	—	—	
A.89	Lobar pneumonia	—	7	—	2	7	—	49	30	
A.90	Broncho-pneumonia	—	8	—	—	8	—	—	—	
A.91	Primary atypical, other and unspecified pneumonia	—	3	—	—	3	—	32	—	
A.92	Acute Bronchitis	—	3	—	—	3	—	1,038	55	
A.93	Bronchitis, chronic and unqualified	—	2	—	—	2	—	145	20	
A.94	Hypertrophy of tonsils and adenoids	—	—	—	—	—	—	—	—	
A.95	Empyema and abscess of lung	—	—	—	—	—	—	—	—	
A.96	Pleurisy	—	—	—	—	—	—	—	—	
A.97 (a)	Pneumoconiosis	—	—	—	—	—	—	1	—	
(b)	All other respiratory diseases	—	1	—	—	1	—	618	50	
A.98 (a)	Dental Caries	—	—	—	—	—	—	83	—	
(b)	All other diseases of teeth and supporting structures	—	—	—	—	—	—	138	5	
A.99	Ulcer of Stomach	—	1	—	—	1	—	—	—	
A.100	Ulcer of duodenum	—	—	—	—	—	—	—	—	
A.101	Gastritis and duodenitis	—	1	—	1	1	—	106	206	
A.102	Appendicitis	—	—	—	—	—	—	—	—	
A.103	Intestinal obstruction and hernia	1	9	—	1	10	—	56	—	
A.104(a)	Gastro-enteritis and colitis between 4 weeks and 2 years	—	—	—	—	—	—	—	—	
(b)	Gastro-enteritis and colitis, ages 2 years and over	—	3	—	—	3	—	148	—	
(c)	Chronic enteritis and ulcerative colitis	—	—	—	—	—	—	—	—	
A.105	Cirrhosis of liver	—	2	—	1	2	—	6	—	
A.106	Cholelithiasis and cholecystitis	—	—	—	—	—	—	—	—	
A.107	Other diseases of digestive system	—	9	—	—	9	—	657	—	
A.108	Acute nephritis	—	1	—	—	1	—	—	—	
A.109	Chronic, other and unspecified nephritis	—	—	—	—	—	—	2	—	
A.110	Infections of kidney	—	—	—	—	—	—	6	—	
A.111	Calculi of urinary system	—	—	—	—	—	—	—	—	
A.112	Hyperplasia of prostate	—	—	—	—	—	—	—	—	
A.113	Diseases of Breast	—	—	1	—	1	—	—	2	
A.114(a)	Hydrocele	—	5	—	—	5	—	27	—	
(b)	Disorders of menstruation	—	—	—	—	—	—	—	13	
(c)	All other diseases of the genito-urinary system	—	8	—	—	8	—	35	—	
A.115	Sepsis of pregnancy, childbirth and the puerperium	—	—	—	—	—	—	—	—	
A.116	Toxaemias of pregnancy and the puerperium	—	—	—	—	—	—	—	—	
A.117	Haemorrhage of pregnancy and childbirth	—	—	—	—	—	—	—	—	
A.118	Abortion without mention of sepsis or toxæmia	—	—	1	—	1	—	—	—	
A.119	Abortion with sepsis	—	—	—	—	—	—	—	—	
A.120(a)	Other complications of pregnancy, childbirth and the puerperium	—	—	—	—	—	—	—	—	
(b)	Delivery without complications	—	—	1	—	1	—	—	—	
A.121	Infections of skin and sub-cutaneous tissue	—	29	—	—	29	—	791	48	
A.122	Arthritis and spondylitis	—	5	—	—	5	—	49	—	
A.123	Muscular rheumatism and rheumatism, unspecified	—	1	—	—	1	—	37	13	
A.124	Osteomyelitis and periostitis	—	—	—	—	—	—	16	—	
A.125	Ankylosis and acquired musculoskeletal deformities	—	—	—	—	—	—	—	—	
A.126(a)	Chronic Ulcer of Skin (including tropical ulcer)	—	19	—	—	19	—	1,35	1,010	
(b)	All other disease of skin	1	6	—	—	7	—	210	22	
(c)	All other diseases of musculoskeletal system	—	3	—	—	3	—	21	—	

RETURN "E"—*contd.*

HER MAJESTY'S PRISONS

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND DISEASES (OUT-PATIENTS)
FOR THE YEAR 1954

Inter- mediate List Number	Diseases	IN-PATIENTS							OUT-PATIENTS	
		Remaining in hospital on 31st Dec., 1953	Yearly Total				Total cases treated	Remaining in hospital on 31st Dec., 1954	Males	Females
			Admissions		Deaths					
			Males	Females	Males	Females				
A.127	Spina bifida and meningocele	—	—	—	—	—	—	—	—	
A.128	Congenital malformations of cir- culatory system	—	—	—	—	—	—	—	—	
A.129	All other congenital malforma- tions	—	—	—	—	—	—	—	—	
A.130	Birth injuries	—	—	—	—	—	—	—	—	
A.131	Postnatal asphyxia and atelec- tasis	—	—	—	—	—	—	—	—	
A.132(a)	Diarrhoea of newborn (under 4 weeks)	—	—	—	—	—	—	—	—	
(b)	Ophthalmia neonatorum ...	—	—	—	—	—	—	—	—	
(c)	Other infections of newborn ...	—	—	—	—	—	—	—	—	
A.133	Haemolytic disease of newborn ...	—	—	—	—	—	—	—	—	
A.134	All other defined diseases of early infancy	—	—	—	—	—	—	—	—	
A.135	Ill-defined diseases peculiar to early infancy, and immaturity unqualified	—	—	—	—	—	—	—	—	
A.136	Senility without mention of psychosis	—	2	—	—	—	2	—	6	
A.137(a)	Pyrexia of unknown origin ...	—	1	—	—	—	1	—	2	
(b)	Observation without need for further medical care ...	—	10	—	—	—	10	—	25	
(c)	All other ill-defined causes of morbidity	—	11	2	—	—	13	—	448	
	<i>Total ...</i>	9	372	14	6	—	390	—	11,235	
									1,863	

Inter- mediate List Number	Accidents, Poisonings and Violence (External cause)	IN-PATIENTS							OUT-PATIENTS	
		Remaining in hospital on 31st Dec., 1953	Yearly Total				Total cases treated	Remaining in hospital on 31st Dec., 1954	Males	Females
			Admissions		Deaths					
			Males	Females	Males	Females				
AE.138	Motor vehicle accidents ...	—	—	—	—	—	—	—	—	—
AE.139	Other transport accidents ...	—	—	—	—	—	—	—	—	—
AE.140	Accidental poisoning ...	—	—	—	—	—	—	—	—	—
AE.141	Accidental falls ...	—	1	—	—	—	1	—	37	—
AE.142	Accidents caused by machinery	—	—	—	—	—	—	—	60	—
AE.143	Accidents caused by fire and explosion of combustible material ...	—	—	—	—	—	—	—	29	—
AE.144	Accidents caused by hot sub- stance, corrosive liquid, steam and radiation ...	—	—	—	—	—	—	—	50	16
AE.145	Accident caused by firearm ...	—	—	—	—	—	—	—	—	—
AE.146	Accidental drowning and sub- mersion ...	—	—	—	—	—	—	—	—	—
AE.147										
(a)	Foreign body entering eye and adnexa ...	—	—	—	—	—	—	—	10	—
(b)	Foreign body entering other orifice ...	—	—	—	—	—	—	—	1	—
(c)	Accidents caused by bites and stings of venomous animals and insects ...	—	2	—	—	—	2	—	17	1
(d)	Other accidents caused by animals ...	—	—	—	—	—	—	—	—	—
(e)	All other accidental causes ...	—	3	—	—	—	3	—	60	12
AE.148	Suicide and self-inflicted injury ...	—	2	—	—	—	2	—	—	—
AE.149	Homicide and injury purposely inflicted by other persons (not in war) ...	—	—	—	—	—	—	—	—	—
AE.150	Injury resulting from operations of war ...	—	—	—	—	—	—	—	—	—
	<i>Total</i> ...	—	8	—	—	—	8	—	264	29

RETURN "E"—*contd.*

HER MAJESTY'S PRISONS

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) DISEASES (OUT-PATIENTS)
FOR THE YEAR 1954

Inter- mediate List Number	Accidents Poisonings and Violence (Nature of injury)	IN-PATIENTS							OUT-PATIENTS	
		Remaining in hospital on 31st Dec., 1953	Yearly Total				Total cases treated	Remaining in hospital on 31st Dec., 1954	Males	Females
			Admissions		Deaths					
			Males	Females	Males	Females				
AN.138	Fracture of skull	—	—	—	—	—	—	—	—	—
AN.139	Fracture of spine and trunk ...	—	—	—	—	—	—	—	—	—
AN.140	Fracture of limbs	—	—	—	—	—	—	—	1	—
AN.141	Dislocation without fracture ...	—	—	—	—	—	—	—	2	—
AN.142	Sprains and strains of joints and adjacent muscle	—	1	—	—	—	1	—	22	—
AN.143	Head injury (excluding skull fracture)	—	—	—	—	—	—	—	—	—
AN.144	Internal injury of chest, abdo- men, and pelvis	—	—	—	—	—	—	—	—	—
AN.145	Laceration and open wounds ...	—	2	—	—	—	2	—	132	12
AN.146	Superficial injury, contusion and crushing with intact skin surface	—	1	—	—	—	1	—	67	—
AN.147	Effects of foreign body entering through orifice	—	1	—	—	—	1	—	3	—
AN.148	Burns	—	—	—	—	—	—	—	20	16
AN.149	Effects of poisons	—	1	—	—	—	1	—	5	—
AN.150	All other and unspecified effects of external causes	—	2	—	—	—	2	—	12	1
	<i>Total</i> ...	—	8	—	—	—	8	—	264	29
	GRAND TOTAL ...	9	380	14	6	—	398	—	11,499	1,892

RETURN "F"

EXTRACTS FROM RETURNS OF CASES TREATED AT RURAL DRESSING STATIONS

Inter- mediate List Number	Diseases	REGIONS OF THE GOLD COAST						
		Accra	Eastern	Western	Trans-Volta/ Togoland	Ashanti	Northern Territories	Total
A.11	Gonococcal infections ...	2	230	5,803	343	495	282	7,155
A.22	Whooping cough ...	3	1,067	583	524	464	110	2,751
A.32	Measles ...	3	913	1,042	398	961	452	2,769
A.34	Infectious hepatitis (jaundice) ...	—	15	113	36	88	43	295
A.42 (a)	Tapeworm infestations ...	—	1	76	5	109	263	454
A.42 (b)	Ascariasis ...	—	2,330	3,504	312	1,213	197	7,556
A.42 (c)	Guinea worm ...	4	76	572	71	153	395	1,271
A.43 (g)	Yaws ...	107	19,280	15,333	12,050	6,751	11,352	64,873
A.43 (h)	Chickenpox ...	—	72	66	143	227	38	546
A.43 (n)	Dermatophytosis (Ringworm) ...	4	254	986	287	463	666	2,660
A.43 (o)	Scabies ...	7	2,241	1,936	1,298	2,131	3,596	11,209
A.73	Epilepsy ...	—	1	11	18	80	5	115
A.74	Inflammatory diseases of eye (conjunctivitis) ...	7	545	1,486	1,322	1,685	3,009	8,054
A.74-76	Blindness ...	—	2	1	3	54	35	95
A.77(a)-(c)	Inflammatory diseases of ear ...	4	484	1,128	921	1,427	1,200	5,164
A.104 (a)	Gastro-enteritis and colitis, 4 weeks- 2 years ...	8	977	588	1,587	1,528	662	5,350
A.104 (b)	Gastro-enteritis and colitis, age 2 years and over ...	—	2,015	1,203	1,595	1,787	1,895	8,495
A.121	Infections of skin and subcutaneous tissue (boils and abscesses) ...	3	1,018	3,033	659	2,033	663	7,408
A.126	Chronic ulcer of skin ...	25	3,074	4,218	5,724	3,749	5,404	22,194
A.132 (a)	Diarrhoea of new-born (under 4 weeks)	4	33	233	265	545	178	1,258



